MISSION

The mission of Delaware County Community College is to offer educational programs and services that are accessible, comprehensive, community centered and flexible in order to enhance the development of the communities and residents of its service area.

DELAWARE COUNTY

MAIN CAMPUS
901 South Media Line Road
Media, PA 19063-1094
610-359-5000
TTY for the hearing impaired:
610-359-5020

MALIN ROAD CENTER
Malin and James Roads
Broomall, PA 19008
610-723-4000

SOUTHEAST CENTER
2000 Elmwood Avenue
Curtis Building
Sharon Hill, PA 19079
610-957-5700

CHESTER COUNTY

EXTON CENTER
906 Springdale Drive
Whiteland Business Park
Exton, PA 19341
610-450-6500

PENNOCKS BRIDGE CAMPUS
180 Pennocks Bridge Road
Jennersville, PA 19390

DOWNINGTOWN CAMPUS
100 Bond Drive
Downingtown, PA 19335
484-237-6200

www.dccc.edu

Delaware County Community College is accredited by the Middle States Association of Colleges and Schools, Commission on Higher Education, 3624 Market Street, Philadelphia, PA 19104.
# Delaware County Community College

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ABBREVIATIONS AND DEFINITIONS

The following abbreviations are used throughout the catalog and refer to courses within a specific discipline:

ACC, Accounting
ADJ, Administration of Justice
AHA, Allied Health
AHM, Allied Health Medical
AHN, Nursing Assistant
AHS, Surgical Technology
AHU, Health Unit Coordinator
ARC, Architecture
ART, Art
AUT, Automotive Technology
BDM, Building Maintenance
BIO, Biology
BUS, Business
BUSI, International Business
CHE, Chemistry
CPT, Carpentry
CSEL, College-Sponsored Experiential Learning
DPR, Computer Information Systems
DRA, Drama
ECE, Early Childhood Education
ECO, Economics
EDU, Education
EGR, Engineering
EIT, Electrical
EMS, Emergency Medical Technology
Emergency Management Planning
Concentrations:

EMF, Fire Science
EMP, Municipal Police Officer
EMM, Emergency Medical Technician
EMTP, Paramedic-Advanced Life Support
ENG, English
ESL, English as a Second Language
ESS, Earth and Space Science
FRE, French
FST, Fire Science Technology
GER, German
GRA, Graphic Design
HIS, History
HMT, Hazardous Materials Technology
HRM, Hotel and Restaurant Management
HSTN, Health Studies, Pre-Nursing Options
HSTU, Health Studies, General Options
HUM, Humanities
HVA, Heating, Ventilating, Air Conditioning
IMM, Interactive Multimedia
INT, Interdisciplinary
IST, Industrial Systems Technology
ITA, Italian
MAT, Mathematics
MATH, Mathematics-Business
MCR, Microcomputers in Business
MPT, Municipal Police Training
MTT, Machine Tool Technology
MUS, Music
NET, Network Engineering
NMT, Nanofabrication Manufacturing Technology
NUS, Nursing
OCS, Occupational Code Studies
OFF, Office Administration
PCT, Process Control Technology
PHI, Philosophy
PHS, Physical Science
PHY, Physics
PLB, Plumbing
PLP, Paralegal
POL, Political Science
PSY, Psychology
REA, Reading
RTH, Respiratory Therapy Technology
ROBO, Automated Manufacturing/Robotics
SCI, Science
SOC, Sociology
SPA, Spanish
SPE, Speech
TCC, Technical Communications
TCS, Construction Technology
TDD, Drafting and Design Technology
TEL, Electronics Technology
TME, Mechanical Technology
WLD, Welding

The following definitions may be helpful to students’ understanding of the educational culture of postsecondary education:

**Academic Record:** transcript of grades, courses, credits and related academic information kept on file by the College

**Associate Degree (A.A., A.S., A.A.S.):** a two-year degree that generally prepares students for further study or entry into the workplace

**Certificate:** recognition provided for completion of short-term vocational or career training programs

**Cooperative Education:** option to attend college and do paid work, receiving credit for both; also called co-op

**Credit:** the value assigned to a college course depending on the number of class hours per week. For example, a three-credit course meets three hours per week

**Elective:** an optional course selected by the student

**ESL (English as A Second Language):** courses offered to non-native speakers to improve writing, reading and speaking skills in English

**FAFSA (Free Application for Federal Student Aid):** a free financial aid application that must be submitted by students seeking grants and/or loans from state and federal governments, colleges and other sources

**GED (Graduate Equivalency Diploma):** a test for people who have not graduated from high school to confirm their mastery of information covered in a basic high school curriculum

**Major:** the course of study in which a student concentrates course work, time and attention

**Mini-Session:** a period less than the fifteen-week semester in which students can complete course work on an accelerated basis

**Placement Test:** assessment given to DCCC students to determine their skills levels in English, reading and mathematics and their academic starting point

**Prerequisite:** a level of accomplishment required prior to enrolling in a particular course. For example, English Composition I is a prerequisite for English Composition II

**Registration:** transaction through which students enroll in course work

**Semester:** usually a fifteen-week period in which college courses are completed
Why thousands of students choose DCCC each year

Delaware County Community College is dedicated to providing high-quality, low-cost educational opportunities that meet the needs of our students.

Quality - Our award-winning faculty are teachers first. Teaching allows them to focus on students and classroom instead of on research.
The College’s competency-based curriculum ensures that our students are really prepared for employment or further education. Our lab and library facilities are the equal of those found at other colleges and universities.

Cost - Delaware County Community College is able to provide quality education at low cost because the state and our sponsoring school districts pay a large portion of the cost. Financial aid in the form of grants, loans, scholarships and work study is also available.

Personal Attention - Our faculty, from instructors to full professors, are committed to being available for our students. Counselors, tutors, librarians and the entire College staff are dedicated to providing the support and services our students need.

Convenient Locations - Delaware County Community College has many locations serving Delaware and Chester counties. The Main Campus is a 123-acre site at Route 252 and Media Line Road in Marple Township. Classrooms, laboratories, faculty and administrative offices, the library, bookstore and cafeteria are located there. Parking for more than 1,800 cars is available. SEPTA serves the Main Campus through several bus routes including 112 and 118.

Other locations include:
• Malin Road Center, Malin and James Roads, Broomall
• Southeast Center, Curtis Building, 2000 Elmwood Ave., Sharon Hill
• Chester Center, at Community Hospital, Chester
• Exton Center, Whiteland Business Park, Route 30 and Springdale Drive
• The Chester County Hospital in West Chester (Nursing Program)
• The Chester County Campus in Downingtown on Rt. 322 in East Brandywine
• Oxford and Upper Darby High Schools
• Pennocks Bridge Campus, Pennocks Bridge Road, Jennersville

In addition, classes are held at other locations throughout Delaware and Chester counties. See the current semester’s course schedule.

Flexible Schedules - Delaware County Community College offers classes during the fall and spring semesters, two summer sessions, and a number of accelerated sessions throughout the year. Classes are scheduled from early morning until 10 p.m. and on weekends. The College has an extensive distance learning program with television courses, online courses and independent study courses.

Results - The true measure of Delaware County Community College’s value can be gauged only by what happens to our students when they leave. They meet their goals.

If this catalog doesn’t answer all your questions, call the Admissions Office at 610-359-5050, or refer to our website: www.dccc.edu.

Service - Delaware County Community College recognizes the importance of providing a supportive, nurturing environment in which individuals can develop academically, professionally and personally. An array of special programs and services help meet students’ needs. See page 13 for a complete listing.
DEGREE AND CERTIFICATE REQUIREMENTS

DCCC’s Philosophy on General Education
The College is dedicated to a comprehensive effort that encourages in individual students the attitude of inquiry, the skills of problem solving and concern for the values of a democratic society. This philosophy of general education seeks to give each student the knowledge, skills and values needed for lifetime learning and for becoming a self-fulfilled individual.

Associate Degree
To graduate, students must:
1. Earn a minimum of 60 credit hours, exclusive of basic, developmental and continuing education courses. Of these, at least 24 must be earned at Delaware County Community College with at least 15 hours in graded courses (courses for which grade points are issued) for the associate degree. Not more than 12 credit hours may be transferred back after completing attendance at this college. A maximum of three credits of physical education activities may be applied toward the 60 credit hours.
2. Have a cumulative grade point average of 2.0 (C) or higher.
3. Complete the approved curriculum satisfactorily. Curricula are itemized lists of courses and credits required for professional and technical competence. Additional curricula will be published in a series of special student bulletins. All approved curricula include courses required by the laws of the State of Pennsylvania and general education requirements.

Certificate of Proficiency
Delaware County Community College will award a certificate of proficiency to students who complete 30 credits of an approved career program. These credits will not normally include physical education, development, basic and/or continuing education courses and will usually consist of 24 credits in the career specialty and six credits in general education. Exceptions may be made upon recommendation of the Academic Affairs Committee. At least 50 percent of the credits must be earned at Delaware County Community College. The student must have a cumulative GPA of 2.0 or higher. At least six credit hours must be in courses that are awarded grade points.

Certificate of Competency
The College will award a certificate of competency to students who complete an approved credit-bearing career program that requires less than 30 credits. General education courses may not be required for programs that have less than 30 credits. The student must have a cumulative GPA of 2.0 or higher. At least six credit hours must be in courses that are awarded grade points.

Application for Graduation
Applications for graduation are available at the Main Campus Student Records Office, and at off-campus locations, in October, March, and June for December, May and August graduations respectively.

Dual and Additional Degrees
A student who has already received a Delaware County Community College degree or certificate may qualify for an additional degree or certificate by 1) meeting the requirements of the additional curriculum and 2) completing at least 12 credits at the College subsequent to those received for the previous degree or certificate.

For Delaware County Community College degree holders, the curriculum leading to an additional degree or certificate must be different from the previous degree(s). General Studies and Technical Studies may not be earned as additional degrees. A degree at the College with options or concentrations is considered one degree and will be awarded only once. Some curricula are very similar, and students may not earn degrees in both. Some examples are:
1) Natural Science and Science for the Health Professions
2) Business Administration and Business Management
3) Computer Information Systems and Information Technology
4) General Business and any of the following majors: Business Administration, Business Management, Business Technology, Accounting, Electronic Commerce and Small Business Management.

For Delaware County Community College certificate holders, the curriculum leading to an additional certificate must be different from the previous certificate(s) and the curriculum leading to a first degree can be the same as or different from that of the certificate.

Students who complete all requirements for two degrees and at least 12 additional credits at the same time may receive two diplomas. General Studies, Technical Studies, and other restrictions listed above under degree holders may not be awarded as part of a dual degree. A certificate and degree in the same or similar curricula may not be awarded at the same time. Students may pursue no more than two degrees at one time and they must inform their advisors of the intent to follow two degrees. They must file two separate graduation applications and pay two graduation fees.

Graduation with Honors
The associate degree or certificate will be granted “With Honors” if a student earns an overall average of 3.0 (B) in all courses applicable to the degree or certificate. For those students with an overall average of 3.5, the award will be “With High Honors.”
Our Unique Advantage:

The Competency-Based Curriculum

Our competency-based curriculum makes the College different from every other community college in the region and most other post-secondary institutions. The competency-based curriculum certifies our graduates as possessing the skills, attitudes and values needed to perform competently in their area of study.

There are three kinds of competencies. College competencies are broad statements of the learning expected of all students. Curriculum competencies describe the skills and knowledge expected of students of specific programs. Course competencies describe the knowledge and skills a student must demonstrate to earn college credit for a course.

Competencies provide a distinct advantage to students, the educational institutions to which they transfer and future employers. They help transfer colleges determine the exchange of learning that has taken place. They help employers identify the skills a Delaware County Community College graduate should possess. They also assist the College in assessing student programs and non-traditional learning.

Course and curriculum competencies are listed with individual curricula and course descriptions elsewhere in this catalog.

College Competencies

The College competencies are the result of a concentrated effort to define and describe the skills and knowledge expected of our graduates. The following broad learning outcomes are expected of all graduates.

Competency 1

Graduates of Delaware County Community College should be proficient in mathematics, reading, writing and speech communication.

A. Mathematical proficiency denotes basic computational skills and analysis required for both life and career tasks. Therefore, graduates should be able to:
   1. Perform basic arithmetic calculations.
      a. Add, subtract, multiply and divide numbers.
      b. Use ratio, proportion, and percent.
      c. Estimate the answer to a problem.
   2. Use the concept of variable to solve problems involving equations and inequalities.
      a. Translate verbal data to algebraic expression, equations, or inequalities.
      b. Solve linear equations and inequalities.
      c. Use functions to express the relationship between one quantity and another.
      d. Evaluate algebraic expressions and formulas.
   3. Use concepts of geometry to solve problems involving measurement and shape.
      a. Use formulas to solve routine problems involving perimeter, area, volume, and angle measure.
      b. Describe the properties of geometric figures.
   4. Apply the principles of probability and statistics to interpret or predict events.
      a. Construct and interpret charts, tables, and graphs summarizing data.
      b. Use sampling techniques.
      c. Define the concepts of mean, mode, and median.
      d. Use the concept of probability to solve problems involving uncertainty.
   5. Use appropriate mathematical reasoning and problem solving strategies to draw logical conclusions from given information.
      a. Use inductive and deductive reasoning to reach conclusions.
      b. Solve problems using appropriate strategies.
      c. Translate a real-life situation into the language of mathematics.

B. Reading is defined as mental activity designed to recognize concepts literally and to interpret symbols; one reads for facts, for meaning, and for understanding and comprehension. Therefore, graduates should be able to:
   1. Determine the main idea of a written passage.
   2. Identify supporting details related to the main idea.
   3. Use a systematic approach to understanding a written passage (such as color coding key passages and note taking or outlining).
   4. Interpret a passage and integrate it into previous knowledge.

C. Writing is the expression of ideas using Standard English with conventional word choice, sentence order, and grammar. Therefore graduates should be able to:
   1. Analyze materials in a critical manner, incorporating the skills of reporting and interpreting.
   2. Evaluate oral and written material in relation to a topic.
   3. Narrow a topic to focus on a central idea.
   4. Create well-organized and varied sentences and paragraphs, using precise word choice.
   5. Write well-organized and logical critical essays on a variety of topics, using an acceptable style, a minimum of errors, and sound supportive data.

D. Speech Communication is the oral expression of ideas using both verbal and non-verbal language. Therefore, graduates should be able to:
   1. Speak in a clear and concise manner.
   2. Describe and use both verbal and non-verbal communication.
   3. List the barriers to communication such as angry tone of voice or prejudicial language.
   4. Implement the skills of listening through active participation and feedback.

Competency 2

Graduates of Delaware County Community College should have a concept of self (needs, abilities, interests, values) and be able to explain the relationship of self to others necessary for making value judgments for satisfying and productive lives. Therefore, graduates should be able to:
   1. Respect others’ values, ways of living, ethnicity and gender.
   2. Illustrate that learning (in cognitive, affective, skill and value domains) can improve one’s self in relation to others.
   3. Set realistic short- and long-range goals (as in employment, social and personal objectives).
   4. Have confidence to take risks by recognizing talents and limitations.
   5. Distinguish between fact and opinion and defend an opinion with logic (e.g. serve on a jury).

Competency 3

Graduates of Delaware County Community College should apply the meaning of career, defined as a whole life endeavor, to make career choices appropriate to individuals’ own needs, abilities, interests, values and education. Therefore, graduates should be able to:
   1. Plan career paths to include both vocational and avocational interests.
   2. Demonstrate that each employment situation is a step toward fulfillment of career paths.
   3. Evaluate employment opportunities for appropriateness in regard to career paths.
   4. Select learning experiences necessary to progress on career paths.
   5. Display flexibility and responsibility in revising career paths in response to changes in society and their personal lives.
Competency 4

Graduates of Delaware County Community College should have the skills to pursue lifelong learning.

Therefore, graduates should be able to:
1. Demonstrate that learning is a lifelong process.
2. Explore beyond discipline/career boundaries to envision a broader awareness of self.
3. Select learning experiences that complement and enrich previously learned information.
4. Welcome the opportunity for change where appropriate.

Competency 5

Graduates of Delaware County Community College should be able to use decision-making processes to solve problems.

Therefore, graduates should be able to:
1. Identify and define problems in terms of objectives, goals and constraining factors.
2. Collect data regarding proposed solutions with respect to problems.
3. Evaluate possible solutions, hypotheses, or testable propositions.
4. Assess the process by which a problem was resolved.

Competency 6

Graduates of Delaware County Community College should be able to analyze the impact of arts and humanities on life and discuss the part which diverse cultural ethnic groups play in the arts and humanities.

Therefore, graduates should be able to:
1. Identify those activities and products which constitute the artistic or humanistic aspects of a culture, including literary, fine, and performing arts.
2. Describe the elements that constitute artistic and humanistic activities that produce works of art.
3. Explain the impact of artistic and humanistic expressions on individuals.
4. Evaluate and analyze their own aesthetic responses to works of art and music.

Competency 7

Graduates of Delaware County Community College should have the skills necessary to analyze social, political, business and economic systems in order to function effectively within them.

Therefore, graduates should be able to:
1. Identify those activities and institutions which constitute the social aspects of a culture (e.g., geographical factors; governmental, business and economic systems; religious, marital and familial institutions; employment and civic, volunteer and recreational organizations).
2. Indicate the impact that ethnicity, social systems and institutions have on the individual.
3. Internalize their own personal place within their culture.
4. Identify the appropriate candidates and positions when using the democratic processes in political and social situations.
5. Integrate the developments of history into current social and economic processes and institutions.

Competency 8

Graduates of Delaware County Community College should be able to analyze the impact and apply the principles of science and technology so that they may make intelligent judgments.

Therefore, graduates should be able to:
1. Identify those activities and products which constitute the scientific and technological aspects of a culture.
2. Acknowledge that scientific concepts, laws or principles underlie technological activities and products.
3. Demonstrate that technology impacts on individuals, cultures, and the physical and ecological environment.
4. Possess scientific literacy in order to make intelligent judgments regarding individual lifestyles.

Competency 9

Graduates of Delaware County Community College should have the skills and experience necessary to make use of contemporary information systems in support of their personal life and career goals.

Therefore, graduates should be able to:
1. Use a Graphic User Interface (GUI) system for entering, manipulating, and retrieving application software.
2. Select and access appropriate software for word processing, spreadsheets, database management, presentations, and graphic functions.
3. Create, edit, print, and save documents using word processing software, spreadsheet software, presentation software, and graphic software.
4. Use the Internet to search for, retrieve, and evaluate information.

Competency 10

Graduates of Delaware County Community College should have a concept of diversity that enables them to appreciate individual and group differences and to recognize that appreciating these differences benefits everyone.

Therefore, graduates should be able to:
1. Consider and understand customs, viewpoints, and opinions generated by persons from backgrounds different than their own.
2. Analyze and evaluate the effectiveness of their own attitudes towards race age, gender, ethnicity, socio-economic status, religion, physical and psychological abilities, sexual orientation and nationality in a world that requires collaboration and cooperation.
3. Use the tools of civil discourse to live comfortably in a world of “widely diverse, cultures, ideas, and viewpoints.”
4. Possess an awareness of the contributions of diverse peoples to the history of the United States and the world, and recognize that these contributions will continue to be worthy of scholarly and public recognition.

Competency 11

Graduates of Delaware County Community College should be able to satisfy the competencies in their chosen curricula.

Delaware County Community College
Academic Guarantee

Delaware County Community College believes that its instructional programs meet the needs of both graduates and employers by providing appropriate job entry skills and the competency levels required to transfer to baccalaureate institutions.

To assure this level of performance, the College allows our graduates the opportunity to enroll for up to fifteen (15) additional credit hours of course work without tuition charge if their skills or competencies do not meet stated expectations of employers or transfer baccalaureate Institutions. This guarantee applies to graduates earning their degree on or after May 2001. Time constraints apply for both when retraining commences and is completed and is limited to course work regularly offered by Delaware County Community College for which the student earned a minimum grade of C.

A copy of the academic guarantee, along with appropriate documents required for retraining, is available from the Student Records Office.
ADMISSION PROCEDURES

Delaware County Community College is committed to providing equal educational opportunity to all who can benefit. This open-door policy allows the College to admit any high school graduate or person who has passed the GED (high school equivalency) exam. Persons 19 or older who have not graduated from high school or passed the GED will be considered for admission on an individual basis. High school juniors and seniors may be approved for enrichment classes by the Admissions Office, in consultation with their principal or guidance counselor. All students seeking credit course work must file an application for admission.

The College strongly recommends that students apply as early as possible. Our admission procedure helps College counselors advise incoming students on the courses they select. Early applicants benefit both from placement testing and college planning sessions with the counseling staff.

How to Apply
An application for admission is available by calling the College at 610-359-5050, or check our website: www.dccc.edu.

If you wish to be enrolled in credit course work, please follow these steps:
1. Submit an admission application along with the non-refundable $25 processing fee:
   • Graduating high school seniors, those graduating within the last three years, those applying to nursing, respiratory therapy, surgical technology, municipal police training, and individuals seeking financial aid must submit an official transcript from their guidance office.
   • Transfer students desiring credit for prior course work must submit official transcripts from all postsecondary schools attended, and the petition for transfer of credit.
   • International students must submit official, certified, English-translated academic credentials and notarized affidavit of support verifying ability to meet expenses before an I-20 is issued.
2. Accepted students will receive information about our Placement Test, along with instructions about how to schedule this exam. Students with prior college credit in English and Mathematics may request a waiver of the Placement Test.
3. Participate in a College Planning Session to meet with a counselor, schedule your classes and learn more about Delaware County Community College.

If you graduated from high school or earned a GED and wish to enroll in credit courses on a part-time basis, you must complete steps 1 and 2 above. You are encouraged, but not required, to also participate in a College Planning Session.

Readmission
Students who have not been enrolled for a year or more or previously applied but did not take classes must reapply to the College. You must follow these steps:
1. Submit an application for admission and check the box on the application that reads, “Check here if applying for readmission.” You do not need to pay the $25 application fee again.
2. Complete the College’s Placement Test if you did not do so when you previously applied to the College or if you did not waive the Placement Test.
3. If you attended another college since leaving DCCC and you want to transfer the credits here, you must submit an official transcript. See “Transferring to DCCC.”
4. Participate in a College planning session to schedule your classes.

If you wish to re-enroll in courses on a part-time basis, you must complete steps 1 and 2 above. You are encouraged, but not required, to participate in a College Planning Session.

Visiting Students
If you attend a four-year college or university but wish to enroll at Delaware County Community College for course work to transfer back to your home institution, follow these easy steps:
1. Together with your completed application, submit a copy of your home institution transcript or a letter from your advisor verifying that you have met any prerequisites associated with our course(s) you wish to take.
   • Be sure to include a major code in the appropriate space on the application form. Most visiting students list “LA” for Liberal Arts.
   • Applications cannot be processed without a major code.
2. Include, with your application and transcript or letter, a note providing the specific course information for the classes you wish to enroll, including CRN (course reference #), SUBJ (subject code), CRS (credits), SEC (section), and TITLE (course title).
3. Either mail all of the above together to the Admissions Office or bring in person during business hours to our Main Campus, Southeast Center, Malin Road Center, Downingtown Campus, or Exton Center.

No High School Diploma or GED
If you have not graduated from high school, are 19 years of age or older, and wish to enroll in credit courses part time, you must:
1. Make an appointment to interview with a member of the admissions staff.
2. Complete a “non-high school graduate petition” for admission and submit it to the director of admissions.
3. Submit an admission application, along with the $25 nonrefundable processing fee.

Special Admissions Programs
Nursing, surgical technology, and respiratory therapy programs have special admission procedures. There is a special international student application for individuals who wish to attend on a student visa. Please contact the Admissions Office (610-359-5050) for a copy of the procedures and guidelines for these programs. Students interested in Municipal Police Training should contact the Malin Road Center (610-359-7386) for admission procedures. Students interested in the Plumbing Apprenticeship should call 610-356-4800 for admission procedures. Paramedic applicants must contact the Program Manager (610-723-4012) for special procedures. Perioperative Nursing applicants should call the Allied Health and Nursing Department 610-359-5353. Technical Studies applicants must contact the Assessment Center, 610-359-5322.
When Additional Preparation is Necessary
Incoming students are required to take placement tests so they can be placed in classes according to their abilities. If remediation is necessary (as determined by placement testing in reading, English and math), the College requires students to complete any required remedial courses before they register for more than 12 college-level credits. If required remediation has not been completed by the time students have attempted 12 college-level credits, they must register for required remediation and receive permission from an academic advisor in order to attempt additional college credits.

Enrollment Opportunities for High School Students
Delaware County Community College strongly encourages students to complete their high school program. There are, however, limited opportunities for academically strong high school juniors and seniors to enroll in course work at the College through Early Admission, Concurrent Enrollment and special Partnership Programs with their high schools. Students should discuss options with their high school counselor and make an appointment with the College’s Admissions Office (610-359-5050) for final approval by the following deadlines:
- July 1 for the fall semester; December 1 for the spring semester; April 15 for Summer I and Summer II.

Transferring to DCCC

Application Procedures
When transferring to Delaware County Community College from another college, you must submit an application form and a $25 non-refundable application fee. You must also ask the registrar at each institution where you have earned college credits to send an official transcript to our Records Office. An petition of transfer, available from the Assessment Center at the Main Campus (610-359-5322) or online at www.dccc.edu; or Welcome Center at Malin Road (610-723-4000), or Learner Services in Exton (610-450-6510) or Downingtown (484-237-6210), or student services at Southeast Center (610-957-5700) must also be submitted for transfer credit evaluation.

If you transfer in English Composition and College-level mathematics courses with grades of “C” or better at an accredited institution of higher learning, you may waive the requirement for placement testing.

If you graduated from high school within three years of the date you plan to attend, an official high school transcript must also be submitted. Students seeking financial aid or those applying for admissions to nursing, respiratory therapy, surgical technology or municipal police training are also required to submit an official high school transcript.

Transfer Credits
The College accepts credits earned at accredited institutions of higher learning for transfer purposes. The acceptance of each transfer credit will depend, however, on the appropriateness of the courses to the selected curriculum, the similarity of the transfer credit to courses offered at the College and on when these credits were earned. If you wish to obtain transfer credit, you must mark the appropriate space on the application form, or complete a petition for transfer of credit form, available in the Assessment Center, or off-campus sites. An official transcript must be sent to the College’s records office. Only 36 transfer credits may be used toward degree requirements. Former Delaware County Community College students who have completed 24 or more credits at the College may transfer a maximum of 12 credits from other institutions to satisfy degree requirements. For information, contact the Assessment Center at the Main Campus (610-359-5322).

Residency Requirements
For purposes of enrollment at Delaware County Community College, a resident is defined as a citizen or permanent resident of the United States. Residents of sponsoring school districts in Delaware County are eligible for the lower sponsoring tuition rate. Residency must be established at least three months prior to registration. If residency within the sponsoring district is for less than three months, the applicant will still be eligible for the lower tuition if it can be proven that residency was established for a reason other than attending the College.

Applicants residing in a non-sponsoring district in Delaware County must pay the non-sponsoring tuition. Residents of other Pennsylvania counties also pay the non-sponsoring tuition. Out-of-state residents and international students must pay the out-of-state tuition rate. Non-immigrants also pay per credit international student fee. Current tuition and fee information is available through the Admissions Office.

Academic Advisement for New Students
An important aspect of the admission process is the college planning and advisement session. Following a presentation on College services, curricula and policies, each new student meets with an advisor to discuss personal goals and educational plans so he or she may gain the most from College programs. The College is committed to helping students with the information needed for them to take responsibility for making good decisions to reach their life and educational goals.

The student, after enrolling for the first semester, is assigned to an advisor. This advisor helps the student evaluate his/her progress at the College and provides information to help the student make appropriate course choices.

For students with disabilities, early advisement is particularly important. Helpful hints, campus orientation and supplemental assistance are provided where appropriate for students with learning, physical, and/or psychological disabilities. Contact the Director of Special Needs Services at 610-325-2748.

International Applicants
Non-immigrant students, requiring a Certificate of Eligibility (Form I-20F or I-20M), must complete the College’s International Student Application. In addition, they must provide the Admissions Office with certified, English-translated (if applicable) academic records of secondary and postsecondary education, and financial documentation verifying their ability to meet all educational and living expenses while studying in the U.S.

The College requires both an affidavit of support and a bank statement reflecting, in U.S. dollars, the funds available to the student. This amount must minimally meet all first-year expenses.

All students entering Delaware County Community College on a student visa must provide evidence of adequate health insurance prior to course registration.

International students who require a student visa must apply to the College for admission to the fall and spring semesters, as well as for summer English as a Second Language (ESL) courses. Because of the time needed to process applications for students requiring an I-20, the Admissions Office must receive all application materials by the following deadlines:
- July 15, for the fall semester
- November 15, for the spring semester
- April 15, for summer ESL courses

Current immigration regulations prohibit B visa holders from enrolling in credit courses. However, they may enroll in up to two non-credit courses each semester. They may also apply for a change of status while in the United States.

Other non-U.S. citizens seeking admission to the College, including Resident Aliens, should follow the regular application process. Please contact the Admissions Office for application materials and information:
- Delaware County Community College
- 901 South Media Line Road
- Media, PA 19063-1094
- USA
- 610-359-5050
- admiss@dccc.edu
Shared Programs with Philadelphia, Bucks and Montgomery County Community Colleges

A shared program allows students from sponsoring school districts or counties to take courses that are not offered at their home institution but available at another local community college. Students who elect to enroll at participating community colleges must be authorized by the director of admissions and pay the host college’s sponsored student rate for courses taken at the host college. Individuals from Bucks, Montgomery and Philadelphia community colleges should consult their home institution’s catalog for eligible programs we offer. Delaware County Community College students residing in sponsoring school districts may participate in the following shared program opportunities:

<table>
<thead>
<tr>
<th>Host College</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bucks</td>
<td>Chefs Apprenticeship</td>
</tr>
<tr>
<td></td>
<td>Environmental Science</td>
</tr>
<tr>
<td></td>
<td>Fine Woodworking</td>
</tr>
<tr>
<td></td>
<td>Historic Preservation</td>
</tr>
<tr>
<td></td>
<td>Sports Management</td>
</tr>
<tr>
<td></td>
<td>Travel and Event Planning</td>
</tr>
<tr>
<td></td>
<td>Women’s Studies</td>
</tr>
<tr>
<td>Montgomery</td>
<td>Automotive Technology</td>
</tr>
<tr>
<td></td>
<td>Dental Hygiene</td>
</tr>
<tr>
<td></td>
<td>Health and Fitness Professional</td>
</tr>
<tr>
<td></td>
<td>Medical Laboratory Technology</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>American Sign Language/Interpreter Education</td>
</tr>
<tr>
<td></td>
<td>Chemical Technology</td>
</tr>
<tr>
<td></td>
<td>Dental Hygiene</td>
</tr>
<tr>
<td></td>
<td>Photographic Imaging</td>
</tr>
</tbody>
</table>

Program offerings at other institutions are subject to change. Interested students should contact the Admissions Office at Delaware County Community College for further information (610-359-5333).

Automation/Process Control Technology for Delaware and Chester County Residents

Delaware County Community College and Montgomery County Community College (MCCC) share the Automation/Process Control Engineering Technology AAS Program. Delaware and Chester County residents can enroll in this program at Montgomery County Community College tuition rates. Interested residents should contact our Admissions Office for further information (610-359-5333). Concurrently, MCCC and Delaware County Community College share the Automated Manufacturing/Robotics Technology and Machine Tool Technology programs. This allows Montgomery County residents to enroll in these programs at Delaware County Community College tuition rates. Interested Montgomery County residents should contact the Admissions Office at MCCC. As part of the 2+2+2 Career Pathways Program, Delaware County Community College and MCCC students are able to matriculate to Drexel University after completing their studies at the community colleges.

Residential Reciprocity

Other community colleges in Pennsylvania have programs of study not available at Delaware County Community College. Students from sponsoring districts who wish to enroll in one of these programs may apply to attend at that institution’s sponsoring tuition rate. Students must get a letter of acceptance from the other community college and then apply to Delaware County Community College for the lower tuition rate. The number of such approvals that can be granted in any given year is contingent upon available funding. To find out more, contact the College’s Admissions Office.

Dual Enrollment with Drexel University

Through a unique agreement, you can earn a Bachelor of Science (BS) in Applied Engineering Technology from Drexel and an Associate of Applied Science (AAS) in Automated Manufacturing/Robotics, Machine Tool Technology, Mechanical Technology or Electronics Technology. Students enroll at both Drexel and Delaware County Community College, working concurrently on both degrees. Most classes are taught at Delaware County Community College. For more information, contact our Admissions Office (610-359-5050 or admiss@dccc.edu).
Credit for Prior Learning

Advanced Placement
Delaware County Community College recognizes superior achievement in secondary schools by granting advanced-placement college credits to qualified students. The maximum awarded is 16 credit hours. Advanced placement allows students to fulfill the requirements for certain courses. The credit given for advanced-placement courses will be counted toward the 60 credits needed for the associate degree.

Eligibility to receive advanced placement and credit is determined by performance on Advanced Placement Examinations administered by the College Entrance Examination Board (CEEB). Students should have their scores sent directly to the Assessment Center at the College. Advanced placement credit is awarded to students earning an appropriate score on CEEB advanced placement examinations in the areas listed below, subject to instructor approval. For specific score requirements, contact the Assessment Center.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credit Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Government</td>
<td>History of Art</td>
</tr>
<tr>
<td>Biology</td>
<td>Microeconomics</td>
</tr>
<tr>
<td>Calculus</td>
<td>Music</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Psychology</td>
</tr>
<tr>
<td>Computer Science – AB</td>
<td>Physics</td>
</tr>
<tr>
<td>English</td>
<td>Spanish</td>
</tr>
<tr>
<td>European History</td>
<td>Statistics</td>
</tr>
<tr>
<td>French</td>
<td>Studio Art</td>
</tr>
<tr>
<td>German</td>
<td>U.S. History</td>
</tr>
</tbody>
</table>

Delaware County Community College also offers advanced placement credit for successfully completed course work through partnership agreements with secondary schools and through the Intermediate Units in Delaware and Chester Counties.
For more information, contact the Assessment Center at 610-359-5322.

College Level Examination Program (CLEP)
The CLEP program is an option for those who have had learning experience in non-traditional settings, such as on the job, travel and/or who have studied on their own. It is possible for a student to earn up to 36 credits through CLEP examinations.

The financial saving of earning credit through CLEP is substantial, even if only a few credits are earned. The student benefits from this program in several other ways: the ability to pursue courses in a particular subject sooner than usual, and the assurance that one is not repeating a subject already known.

Incoming freshmen and transfer students are urged to study this option carefully. For more information, contact the Assessment Center at 610-359-5322.

Credit for Prior Learning
This option provides credit for prior learning through the use of standardized tests or the submission of certificates, transcripts and other information that documents college-level learning earned outside a formal classroom. Examples of informal learning opportunities include apprenticeships, military service, volunteer work, non-credit seminars and travel. Obtaining college credit through the assessment of experiential learning enables faster degree completion. Prior Learning Assessment Counselors guide students in the identification and documentation of their learning experiences as they relate to the College courses and curricula. Portfolios documenting college-level learning and standardized competency examinations are approved for college credit in accordance with the College policy. For more information, contact the Assessment Center (610-359-5322).
Cooperative Education (Co-op) and Internships; College-Sponsored Experiential Learning (CSEL)

Cooperative Education (Co-op) and internships are part of the College’s Experiential Learning program, which integrates off-campus career learning experiences with classroom studies. These experiences are structured to explore career options and/or to prepare for a specific occupation. Students participating in co-op and internships gain college credit and are graded for their learning/work experience by appropriate faculty.

1. Co-op: Students are placed in a paid work/learning position that is directly related to their major field of study. They gain hands-on work experience and learn about related occupational positions in that field.

2. Internship: Students are placed in a non-paid work/learning experience designed to introduce them to several facets of a particular career in an actual work environment.

Co-op/internships can be done in selected majors in both degree and certificate programs. They may be taken for 1, 2, or 3 credits with a maximum of 6 credits per student. Course numbers for the majors participating in co-op/internship are: 199 and 198 for 3 credits, 194 for 2 credits, and 190 for one credit.

Eligibility requirements:

For associate degree programs: completion of a minimum of 21 credits with at least 9 in the major, or core discipline. In some majors more courses are required.

For certificate programs, completion of the required courses for the certificate. The co-op/internship cannot be substituted for a required course.

The following are also required for all programs:

- A grade point average of at least 2.5
- A written faculty recommendation
- A current resume

The Student Employment Services and Co-Op Center staff work with students in securing appropriate opportunities. However, placement is not guaranteed. For more information, call 610-359-5304.

Independent Study

Some programs offer an “independent” instructional mode for self-motivated, highly disciplined students who cannot pursue certain courses within the regular course framework. These courses include “distance learning” (courses aired on local television) and other independent study options designed by the individual instructor. Independent study and telecourses are listed in the course schedule published each semester with the designation “00.”

NOTE: Independent study should not be confused with individualized study. Individualized study courses are those in which students work primarily in the Learning Center rather than the classroom with various types of instructional support and individualized instruction. MAT 040, 060, 100, 120, 121, 140 and 141 are offered in Individualized instruction mode in the Math Science Learning Center (room 1180) on the Main Campus.
SPECIAL PROGRAMS AND SERVICES

Academic Advisement
The mission of the academic advisement system is to help students gain the knowledge and skills and develop the attitudes and values needed to become good, responsible decision-makers regarding their educational, career, and personal goals. Students are assigned advisors during the first few weeks of the semester. The advisor will talk with the student to be sure he or she is in the correct program to meet his or her academic and career goals. Advisors help students take responsibility for choosing the correct courses to complete their program. Advisors are available at Southeast Center, Downingtown Campus, Exton Center, Malin Road Center, Pennocks Bridge Campus, and the Main Campus. For information contact the Career and Counseling Center at Main Campus (610-359-5324); or Learner Services at Exton Center (610-450-6510) or Downingtown Campus (484-237-6210), or Student Services at Southeast Center (610-957-5720).

Academic Computing Services & Instructional Media
Academic Computing Services and Instructional Media maintain and coordinate the use of the academic computer network infrastructure and learning technology equipment in computing facilities and general classrooms. Academic Computing Services operates all academic network file servers, more than 1300 computer stations, and the open computer labs located in rooms 4256 and 4274 at Main Campus. Academic Computing and Instructional Media also collaborate in support of computing and multimedia activities and provides technical support for learning activities facilitated by other departments of the college and covering activities at all major campuses. Other important services include the Wireless network environment, projector systems in classrooms, videoconferencing, TV Studio related activities, and the modern pool service. In addition, Academic Computing generates and maintains user IDs for network, e-mail, and access to the Internet from home.

For information on these services, please call 610-359-5033 or 610-359-5292.

ACT 101

ACT 101 is a state-funded program for educationally underprepared and economically disadvantaged Pennsylvania residents. During the summer, ACT 101 offers an intensive seven-week program of free transitional courses that help make the move to college life in the fall a smooth and meaningful experience. Additionally, professional counseling, tutoring (in reading, writing, mathematics and other subjects) and study skill workshops are offered during the fall and spring semesters. Contact the Act 101 Office in room 1195, Main Campus, at 610-359-5388 for more information, or email the program at act101@dccc.edu.

The Assessment Center
The Assessment Center, located in Main Campus room 2195 (610-359-5322), provides a variety of testing, assessment, academic advisement and other services that support students’ progress toward their academic goals.

Testing services include DCCC placement tests, SLEP Tests for English as a Second Language, College Level Examination Program (CLEP), American College Testing (ACT), Nurse Entrance Test (NET), and General Educational Development (GED) exams.

The Assessment Center evaluates requests for transfer of credit from other colleges. Students must complete the petition for transfer of credit and have official transcripts sent to the College’s records office.

Each student is assigned an academic advisor familiar with the student’s major. Students who have questions concerning their degree or course selection should consult their academic advisor. Students who wish to change their academic major or academic advisor can submit the forms in the Assessment Center.

Students interested in obtaining credit for prior college-like learning should also contact the Assessment Center. For more information, visit our web site: www.dccc.edu, click on “Student Services,” then “Testing and Assessment Services.”

Career and Counseling Services

The College maintains a comprehensive Career and Counseling Center. Services available to students include:

- Academic advising
- Short-term personal and career counseling
- Career information seminars
- An extensive library of career and educational resources
- Coordination of support services for the disabled

Counseling is offered for educational, career and personal development. Counselors can also assist with academic problems, selection of an academic major and personal concerns that may interfere with academic progress.

Counseling is a walk-in service for students and an appointment is not always necessary. For information, call 610-359-5324 for the Marple campus, 484-237-6210 for the Downingtown Campus, 610-450-6510 in Exton, 610-957-5720 at the Southeast Center, and 610-723-4000 at the Malin Road Center.

Community and Corporate Education

The College also offers a number of non-credit training programs, seminars, and courses to meet the educational needs of the residents of Delaware and Chester counties. Each year over 25,000 residents attend classes in such areas as Information Technology Certification, personal enrichment, professional development, programs for children, and special interest courses. These courses are offered on campus, at off-campus sites, and on a contractual basis with companies and community organizations at their location. Customized programs can also be developed to meet the needs of the client. For more information, please call 610-359-5025.

Students with Disabilities

Delaware County Community College welcomes all qualified students with disabilities. Students with learning, physical and/or psychological disabilities seeking accommodations must provide current and comprehensive documentation and meet with the Director of Special Needs Services, room 1320 in the Career and Counseling Center at the Main Campus. For more information about eligibility and documentation requirements and reasonable accommodations, please contact the Director at 610-325-2748.

Distance Learning

The College offers over ninety college-level credit courses through distance learning. Distance learning courses are delivered through the Internet, either online or through a blended learning approach (classroom and online). Distance learning courses maintain the same academic rigor of traditional courses, but do allow students a level of convenience and flexibility.

Some distance learning courses do have campus requirements such as orientations or in person testing. Check current course schedules before enrolling. In person examinations are offered at the Learning Resource Centers at the Main Campus, Southeast Center, Downingtown Campus or Exton Center. For more information, visit www.dccc.edu/dl, email distance@dccc.edu or call 610-359-5158.

Student Ombudsman

The student ombudsman is an impartial resource for students seeking assistance with College policy and procedures. The ombudsman is located in the Enrollment Services Office (room 3555, 610-359-7365) next to the cashier at the Main Campus.
English as a Second Language
Delaware County Community College offers courses and services for students who need English for everyday life, employment, and study in U.S. colleges. Two types of classes are offered:

- Credit courses: Courses in reading, writing, grammar and speaking/listening are offered at three levels (Elementary, Intermediate I and Intermediate II). Students on F-1 or M-1 visas must study full-time. Permanent residents may study either full- or part-time. Students apply through the Admissions Office and are enrolled in classes after sitting for an English as a Second Language (ESL) placement test. The ESL credit program prepares students for introductory-level college courses and English 100, which is required for all degrees. ESL credits do not count toward the student's degree but may be necessary for success. Permanent residents enrolled in ESL courses may be eligible for financial aid. Individuals on student visas are not eligible to apply for financial assistance. Tutoring is required for ESL students in reading, writing and listening/speaking courses. This service supports classroom learning and student proficiency in English.

- Non-credit courses: These courses meet four hours each week. The focus is on English conversation for everyday life, with some reading and writing. Students can register for these courses through the Community Education Office.

Health Center
The College Health Center (room 2260) on the Main Campus (610-359-5140) is available to respond to medical emergencies and minor illnesses on the main campus as well as to promote physical and mental well-being through health education programs. A registered nurse is on duty during both day and evening hours to assist students with medical needs or concerns. Problems needing referrals to outside sources – doctors, hospitals, clinics or other community resources – can be discussed and appropriate referrals can be made. Health Center services are free of charge for students and staff with the single exception of ambulance transport, if needed. Health Center information is available from our web site: go to www.dccc.edu and click on “Student Services,” then “Health Center.”

Intercollegiate Athletics
The College offers opportunities for full- and part-time students to participate in athletic competition at the intercollegiate level. This competitive program allows student athletes to develop skills and team spirit and encourages them to achieve their highest potential. Intercollegiate teams for men include soccer, basketball and baseball; teams for women include volleyball, basketball and softball. Co-ed teams include golf and tennis. The College also sponsors a variety of sports clubs.

Student athletes must be covered by their own health insurance. For more information, contact the director of athletics at 610-359-5047 or visit our web site: go to www.dccc.edu and click on “Student Services,” then “Campus Life.”

Intramural/Recreational Sports
The intramural/recreational sports program provides opportunities for students to participate in informal recreational activities and sports competition. The program offers local open gym nights and individual events, plus access to local recreational facilities and fitness centers. For more information, visit the Campus Life Office on the Marple Campus or call 610-359-5341, or visit our web site: go to www.dccc.edu and click on “Student Services,” then “Campus Life.” In Chester County, call 484-237-6210, or visit the Website.

International Student Services
Delaware County Community College welcomes students from around the world. Recognizing that studying and living in a foreign country is a unique experience, one that can be both exciting and challenging, the Office of International Student Services supports non-immigrant students through a variety of programs and services. These include orientation, personal counseling, academic advising, assistance with immigration matters, and help in locating housing.

The Office of International Student Services is located on the Main Campus in rooms 3508 and 3509. For more information, call 610-359-7336, or 610-359-7322, email DCCCI@dccc.edu or visit our web site: www.dccc.edu and click on “Prospective Student,” then “International Students.”

Student Employment Services and Co-op Center
The Student Employment Services and Co-op Center provides comprehensive support to students and graduates seeking work by offering individual consultations and classroom presentations, information panels, job search skills workshops, resume assistance, mock interviewing, employer information, and on-campus employer recruiting. A computer and laser printer are available for student use in the Center. Three career fairs are presented annually: a part-time job fair in the fall and an allied health and nursing and general fair in the spring. Students anticipating graduation are offered comprehensive one-on-one assistance to prepare for their impending search for employment.

The DCCC Online Job Board www.collegecentral.com/dccc provides access to all types of job openings for students and alumni and the ability to post resumes online for employers to view. Students will also find these job postings at the Center on the Main Campus and in other campus locations. The Center maintains contact with and provides applicants for employers in Delaware, Chester, Montgomery counties, Philadelphia and Wilmington. Students are also encouraged to utilize the Workforce Entry Center located on campus.

The Student Employment Services and Co-op Center administers the Co-op/Internship program which is designed to engage students directly in their area of study through paid or unpaid work&learning experiences which are done for credit. Local employers provide a variety of these opportunities to match the interests of the student.

The Center also administers the Work Study program, a financial aid program that provides funding for students to work in part-time jobs located on campus or in the local community with non-profit organizations. Numerous positions are available on all DCCC campuses as well as in Delaware, Chester and Philadelphia Counties. Many of these jobs provide students with work experience in their field of study.

The Student Employment Services and Co-op Center will open and maintain a file of faculty references for any student who requests one. Copies of these references will be sent to any prospective employer or college designated by the student. To open a reference file, visit the Center in Room 1305 on Main Campus.

For more information about the Center, please visit Room 1305 on Main Campus, call 610-359-5304 or go to www.dccc.edu/studentemployment.

The Learning Centers
At the DCCC Learning Center, students have access to computing resources and receive academic support to enable them to be successful in their classes. All centers provide tutoring, testing service, and numerous instructional resources. Highly skilled instructional assistants in the center teach students to use technology efficiently and effectively in their courses. These services are provided at two Main Campus facilities in the Academic Building: The General Learning Center, 4th Floor (room 4260) and the Math and Science Learning Center, 1st Floor (room 1180). For hours, call 610-325-2778. For other information, call 610-325-2776.

Learning Resource Centers (LRCs) at Satellite Campuses
Learning Resource Centers at each campus offer access to general computing, a study area, tutoring, test proctoring services, and audiovisual-based learning materials. The Centers facilitate access to book loans from the Library and generates College Identification Cards. In collaboration with Learner Services, the LRCs facilitate access to career information via Internet. Also, the LRCs assist students with basic software applications’ support and information techniques for accessing the Library’s online databases and other...
external information resources via Internet. The LRCs may provide additional services such as laptop loans paralleling programs available at the Main Campus.

For information and appointments, please contact the Learning Resource Centers at the following sites:
- Downingtown Campus – 484-237-6224
- Exton Center – 610-450-6511
- Malin Road Center – 610-359-7391
- Southeast Center – 610-957-5725

**The Math/Science Learning Center (Room 1180)**

The Math/Science Learning Center offers students instructional resources, free tutoring and testing for all for science and math courses. Computers are equipped with numerous math tutorials and science programs, and the NSF lab in the center has Internet access on all computers. Help is available from staff in accessing the math programs. Testing services are available for make-up tests and for special testing conditions. In addition, seven individualized math courses are taught in the center by our faculty in a self-paced format. Students in the courses have access to instructional software, videos, tutoring and testing support. For hours, call 610-359-5299. For other information, call 610-359-5076.

**New Choices/New Options**

New Choices is a FREE program that assists single parents, displaced homemakers, and individuals in transition in achieving economic security. Guidance is provided in determining career interests, exploring career and training opportunities and preparing for success in today’s job market. Non-credit “computer basics” and math review classes are included. New Options offers guidance, internships, tuition support, and job placement help for students interested in careers non-traditional to gender. (Example: women/engineering; men/nursing.) Classes are offered in January, April and September at the Marple Campus, the Southeast Center and Downingtown or Exton campuses. Evening classes are offered at the Marple campus. For additional information, call 610-359-5232 or visit room 1301 at the Marple Campus.

**Library**

The College’s library on the Main Campus offers a variety of resources and services to support the curriculum and information needs of the students, faculty, and staff. Located on the fourth floor of Founders Hall, the library collection contains over 50,000 items including books, videos, audio CDs, microforms, and other media. While the library subscribes to over 250 periodicals in hard copy, access to an additional 13,000+ periodicals is gained through online database subscriptions. As well, numerous computers and laptops are available in both the library and the library computer/group study and instruction labs for research, academic work, Internet access, and email. Materials are accessed through an online catalog linked to the library website at http://www.dccc.edu/library. Items not available in the College’s library may be obtained through reciprocal borrowing with colleges in a tri-state area consortium or through a national inter-library loan program. As well, students at satellite campuses are served through an Intra-Campus Borrowing program. Community members are welcome and may borrow for a fee. All library transactions require a valid College ID which may be obtained at the library or any of the off-campus Learning Resource Centers. For more information about the library and its programs, please call 610-359-5326.

**Student Activities**

The College supports a variety of clubs, organizations and special events to enrich the lives of students. The Campus Life Office coordinates the activities of the Student Government Association, literary magazine, radio station, theatre and academic and special-interest clubs. Many opportunities are available for social interaction and the development of leadership and career-related skills through social, cultural and recreational activities and community service projects. Trip programs are also featured.

The Campus Life Office, at the Marple Campus, (610-359-5341) can help you join a club or organization or form a new one. For more information, visit our website: www.dccc.edu and click on “Student Services” then “Campus Life.” In Chester County, call 484-237-6210.

**Transfer Office**

The Transfer Office, located in the Career and Counseling Center (Room 1325, 610-359-5060) offers valuable resources to students who plan to transfer to a four year college or university. College guides, college catalogs, course equivalency guides, transfer agreements, transfer counselors and other transfer information are available. Students planning to transfer are encouraged to utilize the Transfer Office early, preferably within their first semester. Appointments are necessary. Transfer Counseling is also available at the Southeast Center (610-957-5700), the Downingtown Campus (484-237-6210) and at the Exton Center (610-450-6510).

**Transitional Programs**

For students seeking to remedy individual skill deficiencies, courses are offered in mathematics, reading/study skills and writing. These courses are required for students who, based on their placement scores, would not otherwise be successful in college-level courses. These courses are a prerequisite for many 100-level courses. No credit toward a degree is awarded for transitional courses.

**Writing Center**

The Writing Center has a professional staff of tutors who assist students in achieving success with any writing assignment. Their “writing across the curriculum” approach helps students with outlining and organizing essays, writing business communications, preparing lab reports and compiling research. The Center’s IBM and Mac computers are available to students for word processing documents. Make an appointment today.

**PA CareerLink**

PA CareerLink is a one-stop resource center connecting job seekers with employers through technology and individual assistance. PA CareerLink team members represent the Bureau of Workforce Development Partnership, the Delaware County Office of Employment and Training, the Office of Vocational Rehabilitation, Veterans Employment and Training Services, and the Delaware County Community College. Unemployment Compensation claims and appeals may be filed using dedicated equipment. Students, graduates and members of the community who seek labor market information, employment opportunities and support services are encouraged to visit the PA CareerLink in the Workforce Entry Center on the Main Campus.

**Workforce Entry Center (WEC)**

The Workforce Entry Center is a state-of-the-art facility focused on local workforce development issues. Designed and staffed in partnership with PA CareerLink, the center serves those seeking entry or re-entry into the workforce, career changers, employers, educators and the community at large. Computer workstations, resource areas and office equipment are available for self-directed employment related activities. Career development workshops and individual career evaluation and guidance services are available. The Workforce Entry Center, in partnership with Student Employment and Co-op Services, serves as a gateway to career resources for students, educators and the community. For information, call the WEC at 610-723-1220 or visit www.dccc.edu/wec.
Tuition
(as of Fall 2008)

<table>
<thead>
<tr>
<th>Category</th>
<th>Per Credit Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residents of sponsoring school districts</td>
<td>$90</td>
</tr>
<tr>
<td>Pennsylvanians residing in an area that does not sponsor</td>
<td>$180</td>
</tr>
<tr>
<td>Non-Pennsylvania residents</td>
<td>$270</td>
</tr>
</tbody>
</table>

The College reserves the right to change without notice the tuition and fees herein stated. (Tuition and fees do not include the cost of textbooks.)

Fees

Application Fee (non-refundable)
A $25 fee is charged when applying for enrollment in credit courses. The fee is effective for two years from the admission term. If the student does not register within this period, an additional application and fee will be required.

Instructional Support Fee
Instructional support fees are charged to support the cost of technology and/or the cost of unusual staffing, supply or facility costs associated with the course.
Credit courses are charged either $26.00, $31.00 or $36.00 per credit hour.

Plant Fee
A plant fee is charged to all students who do not reside in a school district that sponsors Delaware County Community College.
The plant fee for non-sponsors who live in Pennsylvania is $3 per credit hour.
Plant fee for out-of-state students is $6 per credit hour.

Student Activity Fee (non-refundable)
Per credit hour: $2

Maintenance Fee
A per-credit hour maintenance fee may be charged to all students who do not reside in a sponsoring school district of the county.

Records Processing Fee (non-refundable)
This fee is charged each semester to students to cover the cost of transcripts, enrollment/payment verification, early registration, drop/add processing and parking lot services.
College credit courses: $20/term
Non-credit courses: $5/term

Payment Plan Fee (non-refundable)
A $30 fee is charged for deferring payment of tuition and fees through the College’s Payment Plan. The payment plan is limited to credit courses and is not available to international students. Payments and due dates vary by term. Specific information about the plan may be obtained from the cashier at 610-359-5118.

Late Registration Fee (non-refundable)
A $20 fee may be charged to all students who register for courses after the announced registration dates or during the designated late registration period.

Check Service Fee
A $25 fee is charged each time a check is returned by the bank.

Commencement Fee (non-refundable)
A $25 fee is charged to all students who notify the College of their eligibility to graduate by filing the appropriate application. The fee covers the cost of completion credentials, rental of cap and gown, and other commencement expenses. This fee is assessed only once per degree.

Certificate of Competency Fee (non-refundable)
A $10 fee is charged to all students who anticipate completing Certificate of Competency program requirements and file the appropriate application form. The fee covers the cost of completion credentials. For concurrent certificates, additional forms and fees apply.

International Fee (non-refundable)
A $35 per credit hour International Fee is charged to students who are citizens of a country other than the United States and who enter on non-immigrant visas. This fee is used to support services to international students at DCCC.

Payment Policy
All tuition and fees are payable at time of registration unless the student participates in the College’s Tuition Payment Plan (see below). The College accepts American Express, VISA, MasterCard, Discover Card, cash, money orders and personal checks. The Exton, Southeast and Malin Road Centers do not accept cash.
Students will not receive grade reports or transcripts and will be barred from registration or commencement until financial obligations are settled to the satisfaction of College officials.

Tuition Payment Plan
Students in credit courses may pay tuition in a maximum of four equal monthly payments. International students are not eligible for the tuition payment plan. Information about the plan is available from the cashier or by calling 610-359-5118.
Tuition and Fee Refund

To be eligible for any refund, the student must officially withdraw from the course or courses. Contact the Records Office for details. A refund will not be issued that is greater than 100% of tuition and refundable fees minus any non-refundable fees and required deposits. Students who receive federal financial aid and withdraw before completing 60% of the semester will have all or a portion of that aid returned to the federal fund before any refund is issued (see financial aid section of this catalog). Refund of eligible payments will be made according to the following schedule:

<table>
<thead>
<tr>
<th>Time of Withdrawal During Semester</th>
<th>% Rate for Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the start of classes</td>
<td>100% (0% of class time)</td>
</tr>
<tr>
<td>Before end of one week of classes</td>
<td>80% (7% of class time)</td>
</tr>
<tr>
<td>Before end of two weeks of classes</td>
<td>60% (15% of class time)</td>
</tr>
<tr>
<td>Before end of three weeks of classes</td>
<td>40% (20% of class time)</td>
</tr>
<tr>
<td>September 22-October 30</td>
<td>W Grade</td>
</tr>
</tbody>
</table>

*Refund for summer sessions, special sessions and all irregularly scheduled sessions and courses is determined by the percentage of class time elapsed.

FINANCIAL AID

How to Apply for Financial Aid

Students must reapply for each academic year. An academic year, for financial aid awarding, covers the calendar period July 1st through June 30th, and typically includes the terms Second Summer Session, Fall Semester, Spring Semester and First Summer Session.

Step 1: Apply for admission to Delaware County Community College. All Financial Aid recipients must be admitted to an approved academic program. All DCCC certificate and associate degree programs of 16 or more credits are approved for federal financial aid and all associate degree programs are approved for federal and Pennsylvania state aid. To apply, please go to the web site http://www.dccc.edu/prospective/gettingstarted/ or call 610-359-5050.

Step 2: Most, eventually all, financial aid processing is being done electronically over the Internet. It is the fastest and most accurate way to apply for and receive your aid. Therefore we strongly recommend that you apply for a PIN at http://www.pin.ed.gov. The PIN will represent your signature on several important federal aid documents such as the Free Application for Federal Student Aid (FAFSA) and the Master Promissory Note (MPN) (more about those later). If you are a dependent student one of your parents should apply for a PIN.

If you do not have Internet access you can pick up the paper version of any of the forms mentioned in this section of the catalog at the Financial Aid Office on the Main Campus, the Southeast Center or the Downingtown Campus. You can also access the website from any of the public libraries in Delaware and Chester Counties, including the library on the Main campus. You may also use our kiosks located on the Main, Downingtown and Southeast Center campuses.

Step 3: Complete a Free Application for Federal Student Aid (FAFSA). This is the basis for all need-based financial aid, federal and state. The most efficient way to complete this form is online. Please go to the web site http://www.fafsa.ed.gov and follow the instructions. The College will electronically receive your eligibility information in approximately two weeks after you submit your FAFSA. Information from the paper version will electronically arrive at the College approximately two weeks after you submit your FAFSA. No federal or state aid can be credited to your account until a complete FAFSA is on file in our Financial Aid Office. Our SCHOOL CODE NUMBER is 007110.

Step 4: Do an online nationwide scholarship search at http://www.educationplanner.com or go to your local public library.

Federal Selective Service Requirement

All male students born after January 1, 1960 must register with the Selective Service System between their 18th and 26th birthdays or they will not be eligible to participate in any Federal Student Financial Aid programs. This requirement applies to all male U.S. citizens and to male non-citizens who enter the United States before their 26th birthday.

Important points:
• It is too late to register after your 26th birthday; therefore if you have not registered by that date you cannot receive Federal Student Aid.
• Male non-citizens who are not registered with the Selective Service System must prove that they did not enter the United States until after their 26th birthday.
• Males who are currently serving in the armed services and are on active duty (not members of the Reserves or the National Guard) are exempt from this requirement. (See below)
• Veterans of the armed services are not exempt from this requirement and must have registered with the Selective Service System between their 18th and 26th birthdays.
How Financial Aid is Awarded
The amount of financial assistance a student receives is determined by the student's demonstrated need according to the following formula:

\[
\text{Cost of Education minus Expected Family Contribution (EFC)} = \text{Demonstrated Need}
\]

Cost of Education is calculated for the 2007-2008 academic year, two semesters (fall and spring), on the basis of full-time enrollment, according to the following table:

<table>
<thead>
<tr>
<th>Dependent/Non-sponsoring</th>
<th>Dependent/Non-sponsoring</th>
<th>Independent/Sponsoring</th>
<th>Independent/Non-sponsoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition &amp; Fees</td>
<td>3,640</td>
<td>3,640</td>
<td>6,340</td>
</tr>
<tr>
<td>Books and Supplies</td>
<td>1,350</td>
<td>1,350</td>
<td>1,350</td>
</tr>
<tr>
<td>Personal Expenses</td>
<td>1,000</td>
<td>1,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Living Allowance</td>
<td>1,300</td>
<td>1,300</td>
<td>5,850</td>
</tr>
<tr>
<td>Transportation</td>
<td>1,060</td>
<td>1,060</td>
<td>1,060</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8,470</strong></td>
<td><strong>11,100</strong></td>
<td><strong>16,600</strong></td>
</tr>
</tbody>
</table>

A student's aggregate need-based aid cannot exceed “Demonstrated Need.”

If a student does not enroll full-time, enrolls in fewer than or more than two semesters or enrolls in ineligible courses, the Cost of Education will be calculated differently. If you have any questions, please contact the Financial Aid Office at finaid@dccc.edu

**The U.S. Department of Education (USDE) determines whether a student is dependent or independent based on information you submitted on your Free Application for Federal Student Aid (FAFSA). The Registrar's Office of the College determines your residency status.**

After financial aid eligibility is determined and an aid package is developed, the Financial Aid Office will mail an Award Letter to the student. The award will also be available at http://www.dccc.edu/studentrecords

Statement of Satisfactory Academic Progress Policy for DCCC and Federal Assistance Programs
USDE regulations require that all students meet minimal quantitative and qualitative standards of academic progress toward a degree in order to continue receiving federal financial assistance. Federal SFA funds are: the Federal Pell Grant, Federal SEOG Program, Federal Work/Study Program, and the Stafford Loan Program. The College has adopted the following standards of satisfactory academic progress to comply with this federal requirement. These standards are for financial aid purposes only and neither replace nor override any of the College's other academic policies

1. A student is required to complete, with a passing grade, 67% of all credits attempted at Delaware County Community College. This quantitative standard is calculated as “number of credits successfully completed” divided by “number of credits attempted”. Successful completion of a course is indicated by a grade of A, B, C, D, or P or HP; unsuccessful completion is indicated by a grade of E, F, W, IN, NP, IP or NR. Audited classes are not considered nor are courses completed at another institution and transferred into Delaware County Community College.

2. A student must attain a specific cumulative grade point average upon completion of a specific number of credits. This qualitative requirement is set as follows:
   - 15 credits earned or below – 1.50 minimum Grade Point Average (GPA)
   - between 16 credits and 30 credits earned – 1.75 minimum GPA
   - between 31 credits and 45 credits earned – 1.90 minimum GPA
   - between 46 credits and 90 credits earned – 2.00 minimum GPA
3. Federal regulations also state that a student is not eligible to receive federal financial assistance after having attempted 150% of the required credits for a degree. A typical Associate Degree at Delaware County Community College requires completing approximately 60 credits; therefore, a student can not receive financial assistance after having attempted 90 credits, regardless of the student's completion rate (number 1 above) or grade point average.

Reestablishing Satisfactory Progress
A student who has not met either requirement 1 or 2 listed above may reestablish his/her eligibility to receive federal financial assistance by enrolling at the College at his/her own expense and completing a sufficient number of courses at a sufficiently high grade point average to meet the standards. To be reinstated, a student must submit a letter of appeal (see below). Classes taken at other colleges or universities will not be taken into consideration for the purpose of financial aid reinstatement.

Right to Appeal
A student who has been determined ineligible to receive federal financial assistance for failure to meet the above standards of satisfactory academic progress may submit an appeal in writing to the Financial Aid Office. Appeals will be granted only where mitigating circumstances exist such as if the student became very ill, was severely injured or suffered the death of a parent, child or spouse. A waiver may also be granted if there has been a lapse of four years or more between a prior enrollment at the College and the term for which financial aid is sought. Appeals, for any reason, can only be considered if they are received in the Financial Aid Office one month prior to enrollment or within one month after the time that the student is sent notification of failure to make satisfactory academic progress.

Minimal Satisfactory Academic Progress Policy for Pennsylvania State Grant
Delaware County Community College is required to insure that a student receiving a Pennsylvania State Grant is making "Satisfactory Academic Progress." This process is similar to, but slightly different from, the federal process listed above. Before the PA State Grant is credited to an account, the Financial Aid Office must check to see if the student received any prior State Grants. This is done using a "Cumulative Grant Counter" supplied by PHEAA. The Cumulative Grant Counter is assigned to a recipient based on prior grants received. A student is assigned a .25 Grant Counter for a part-time grant received and a .50 Grant Counter for a full-time grant received during any prior semester.

For example; if a student enrolls for six credits in the fall semester of 1999 and receives a part-time State Grant and then enrolls for 12 credits in the spring semester and receives a full-time State Grant, the Cumulative Grant Counter would be set at .75 (.25 fall + .50 spring). At this level the student must have earned at least 18 total credits and have a least a 1.50 GPA (see chart below). The student in this example would have had to pass all the courses attempted and have a 1.50 GPA to receive a subsequent State Grant. An "F" grade or a withdrawal would have to be made up in a semester without State Grant aid before the student would be eligible for further State Grants.

See chart below for progress requirements for the PA State Grant:

<table>
<thead>
<tr>
<th>Cumulative Grant Counter</th>
<th>Minimum Required Credits Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>.25</td>
<td>6</td>
</tr>
<tr>
<td>.50</td>
<td>12</td>
</tr>
<tr>
<td>.75</td>
<td>18</td>
</tr>
<tr>
<td>1.00</td>
<td>24</td>
</tr>
<tr>
<td>1.25</td>
<td>30</td>
</tr>
<tr>
<td>1.50</td>
<td>36</td>
</tr>
</tbody>
</table>

Delaware County Community College
To receive a PA State Grant beyond the 2.00 counter requires special circumstances defined by the Pennsylvania Higher Education Assistance Agency. Contact the Financial Aid Office at Delaware County Community College for details if more than four full-time semesters or eight part-time semesters is needed to complete the associate degree.

If the Financial Aid Office determines that a student has made Satisfactory Academic Progress or has not received prior grants, we may still have to make adjustments to the PA State Grant. The information used to determine eligibility must agree with actual enrollment i.e. residency status (sponsoring or non-sponsoring) and enrollment status (full time, 1/2 or more credits per semester or part-time, between 6 and 11 credits per semester).

**Refund to Federal Programs When the Student Withdraws**

The Higher Education Amendments of 1998, Public Law 105-244 creates a formula to determine the amount of Federal Student Financial Aid (SFA) Funds a student has earned when he or she completely ceases attendance without finishing the payment period (semester or summer term) for which the funds were awarded. Federal SFA funds are: the Federal Pell Grant, Federal SEOG Program, Federal Work/Study Program, and the Stafford Loan Program. Up through the 60% point in each payment period, this formula (see "amount of federal student assistance earned" below) is used to determine how much federal financial assistance the student has earned at the time of withdrawal. After the 60% point in the payment period, a student is considered to have earned 100% of the federal financial aid program funds.

This schedule applies only to the amount of SFA funds that a student, who withdraws from all courses they enrolled in during any payment period, may keep. The schedule does not apply to how much the College may charge for these courses.

The student’s withdrawal date shall be:

- The date the student began the College’s official withdrawal process, or
- The date the College registrar received official notification from the student of her and his intent to withdraw. This can be in the form of a letter from the student, or another individual with written authorization from the student.
- Or if the student does not follow the College’s official withdrawal process nor provide satisfactory official notification of withdrawal, then the date of withdrawal shall be set as the mid-point of the payment period.

The calculation of amount of federal SFA assistance earned shall be:

- If the student’s withdrawal date is on or before the 60% point of the payment period for which financial assistance was awarded, the percentage of total SFA earned is equal to the percentage of the payment period that was completed.
- If the day the student’s withdrawal date occurs after the student has completed 60% of the payment period, the percentage earned is 100%. The amount not earned (the complement of the percentage earned) must be returned to the U.S. Department of Education.

The calculation of the percentage of the payment period completed shall be:

- Total number of calendar days in the payment period for which the assistance is awarded divided into the number of calendar days completed as of the day the student withdrew.

The calculation to determine who pays the repayment:

- If the student has not received a refund of SFA funds, the College repays the entire amount due.
- If the student has received SFA funds, the College must repay the lesser of:
  1. The full amount of the unearned funds or
  2. The total institutional charges multiplied by the “unearned percentage.”

The student pays the remainder.

**Order of the return of SFA funds:**

- Unsubsidized Stafford Loan
- Subsidized Stafford Loan
- Federal Pell Grant
- Federal Supplemental Educational Opportunity Grant

**Leave of Absence Policy**

Delaware County Community College does not permit students to take an extended leave of absence during a semester. If a student experiences a sudden, unforeseen circumstance making it temporarily impossible for her/him to continue her/his studies during a particular semester, that student must formally withdraw from the College for that semester through the Student Records Office. If the student is unable to come to the Student Records Office, the student’s parent or spouse may initiate the withdrawal with written authorization from the student.

Timing of the withdrawal will affect the amount of charges/refund accessed by the College and may affect the amount of federal Title IV financial aid that the student will be able to retain. See the section of the college catalog titled “Tuition and Fees” for further details.

**Financial Aid Programs**

**NEED BASED PROGRAMS**

**Federal Pell Grant**

A Federal Pell Grant does not have to be repaid. Pell Grants are awarded only to undergraduate students who have not earned a bachelor’s degree. To determine if a student is eligible financially, the U.S. Department of Education uses a standard formula, established by Congress, to evaluate the information you report on your FAFSA. The formula produces an Expected Family Contribution (EFC) number. The Student Aid Report (SAR) contains this number, in the upper right portion of page 1, and will tell you if you’re eligible for a Pell Grant; Delaware County Community College will tell you the amount you are eligible for on your award notification. Grants for the 2007-2008 award year (July 1, 2007 to June 30, 2008) will be between $200 and $4,050. You can receive only one Pell Grant in an award year. How much you get will depend on your EFC, on your cost of attendance, whether you’re a full-time or part-time student, and whether you attend school for a full academic year or less. You may not receive Pell Grant funds from more than one school at a time. The College will credit the Pell Grant funds to your tuition account. Your Award Letter will tell you when your grant will be paid and how much your award will be. If you’re otherwise eligible, you may receive a Pell Grant by enrolling less than half-time (3 to 5 credits); however, you won’t receive as much as if you were enrolled full time.

**Federal SEOG Program**

A Federal Supplemental Educational Opportunity Grant (FSEOG) is for undergraduates with exceptional financial need—that is, students with the highest demonstrated need—and gives priority to students who receive Federal Pell Grants. An FSEOG doesn’t have to be paid back. The U.S. Department of Education guarantees that each participating school will receive enough money to pay the Federal Pell Grants of its eligible students. There’s no guarantee every eligible student will be able to receive a FSEOG; students at the College may be awarded an FSEOG based on the availability of funds. FSEOG awards will be between $100 and $500 a year, depending on when you apply, your level of need, the availability of funds and our awarding policies. When all the conditions of the award are met, the Financial Aid Office will credit your account.
Federal Work/Study Program
The Federal Work-Study Program provides jobs for students with financial need, allowing them to earn money to help pay education expenses. The program encourages community service work and work related to your course of study. Your Federal Work-Study wages will be at least the current federal minimum wage, but in most jobs at the College it will be higher. Your total Federal Work-Study award depends on when you apply, your level of need, and the funding level at the College. Student/Workers will be paid by the hour on a bi-weekly basis. Your Federal Work/Study job may be on campus or off campus. If you work off campus, your employer will usually be a private nonprofit organization or a public agency, and the work performed must be in the public interest. The amount you earn can’t exceed your total Federal Work-Study award. When accepting work hours you should consider your class schedule and your academic progress as well as your financial need.

PHEAA State Grant
The State Grant Program provides grants to eligible Pennsylvania residents who are in need of financial aid to attend a PHEAA-approved post-secondary school as undergraduate students. Those who apply in 2007-2008 may receive up to $3,300 as a full-time student at the College. Students enrolled on a half-time basis (at least six credits or its equivalent) receive up to $1,650. Students enrolled in summer study may also be eligible for a summer State Grant, provided they are registered in both Summer I and Summer II sessions. Major eligibility requirements are:
• Meet financial need criteria.
• Be enrolled at least half-time in a PHEAA-approved undergraduate two-year program of study leading to an Associate Degree.
• Be a high school graduate or the recipient of a GED.
• Demonstrate academic progress for continued aid.
• Be a Pennsylvania resident.

Application procedure & deadlines:
To be eligible a student must file a Free Application for Federal Student Aid (FAFSA) by the appropriate date:
• May 1st immediately preceding the academic year for all renewal applicants and new applicants who plan to enroll in an undergraduate Associate Degree, college transfer program.
• August 1st immediately preceding the academic year if you are a first-time applicant who plans to enroll in an Associate in Applied Science, terminal non-transferable, program.

All students are urged to apply even if the deadlines have passed, since late applications are considered if funds permit.

For more information about the Pennsylvania State Grant go to the Internet site http://www.pheaa.org/index.html

Pennsylvania New Economy Technology Scholarship Program
Technology Scholarships provide up to $1,000 per year, based on total educational costs, to Pennsylvania high school graduates who don’t seek a four-year education but do want to succeed in a technology-based economy. Students enrolled part-time are eligible to be considered for a scholarship that covers up to 20 percent of their tuition and mandatory fees. To qualify, a student must:
1. Be a resident of the Commonwealth of Pennsylvania;
2. Be a high school graduate;
3. Be enrolled in an approved science or technology program at an approved Pennsylvania community college;
4. Maintain at least a 3.0 cumulative grade point average;
5. Begin employment in the state within one year after completion of studies, one year for each year that the scholarship was awarded;
6. Apply for a Federal Pell Grant and a Pennsylvania State Grant.

For more information about the Pennsylvania New Economy Technology Scholarship go to the Internet site http://www.pheaa.org/students/s2.shtml

Federal Stafford Loan Program
Federal Stafford Loans are long-term, low-interest loans made to a student by a private lending institution such as a bank. To be eligible for a Stafford Loan a student must:
• Complete a Free Application for Federal Student Aid for the appropriate academic year.
• Be a US citizen or eligible non-citizen.
• Be accepted for admissions to DCCC in a federally approved program and, if enrolled, be making satisfactory academic progress.
• Be enrolled or planning to enroll as at least a half-time student (six credits or more) in each term for which loan funds are to be awarded.
• Not be in “Default” on an education loan or owe any education grant refund.

Stafford Loan Application Procedure
The student must complete the FAFSA and a Stafford Loan Instruction Sheet, available at the College Financial Aid website. Our Financial Aid Office will then electronically certify the loan with the Pennsylvania Higher Education Assistance Agency (PHEAA). They will send a form called the Master Promissory Note (MPN) that must be signed and returned to PHEAA. When PHEAA receives the MPN they will instruct the student’s bank to send a check to DCCC made jointly payable to the College and to the student.

Definition of an Academic Year for Federal Student Financial Aid
For federal Financial Aid purposes, the College defines its Academic Year as at least 24 credit hours and 30 weeks of instruction time. If you are enrolled in a Certificate Program of less than 24 credits, Federal Regulations require that the College’s Financial Aid Office pro-rate the freshman annual loan limit based on the number of credits in the program of study. Note: regardless of the length of time it takes you to complete your program of study, you can never exceed this pro-rated annual loan limit.

Stafford Loan Disbursement
All Federal Stafford Loans are disbursed in two nearly equal disbursements during a loan period. For the traditional academic year, the Fall Semester and Spring Semester, the most common borrowing period, the first disbursement will occur during the Fall semester and the second disbursement will occur during the Spring semester. For a single semester or term, Summer II, Fall, Spring or Summer I, the first disbursement will occur at the beginning of the semester and the second disbursement will occur at the half-way point of the semester.

Our Cashier’s Office will be notified that the loan is in process and they will wait for payment for tuition and fees (up to the amount of the loan) until your loan is disbursed.

These disbursements are sent to our Cashier’s Office by the Pennsylvania Higher Education Assistance Agency by Electronic Fund Transfer (EFT). When your funds arrive we will send you a ‘Notice of Disbursement’ postcard or e-mail. This notice directs you to the Student Records Access on our website, where you can see what type of loan was credited to your account and what amount is being disbursed. YOU MAY CANCEL THE LOAN WITHIN TEN DAYS OF THE DATE OF THIS DISBURSEMENT. To cancel you must submit written notification to the FAO on the Main Campus in Media that you want to cancel your loan.

If the disbursement exceeds the charges on your account the Cashier will make a check payable to you and available in the Cashier’s Office fourteen days after your account is credited, or fourteen days from the end of the refund period, whichever is greater.

These processes apply whether the loan is subsidized or unsubsidized. Disbursement dates may be affected by the time that the application process is completed.
Subsidized Stafford Loan vs. Unsubsidized Stafford Loan

Eligibility for a Subsidized Stafford Loan is calculated as:

Cost of Education minus EFC minus other aid = eligibility.

If the student has eligibility the federal government will pay the interest on their Stafford Loan while they are in school as at least a half-time student. For the Unsubsidized Stafford Loan the calculation is:

Cost of Education minus other aid = eligibility.

The EFC is not part of the calculation (although the student must still submit the FAFSA form). With the unsubsidized Stafford Loan the student is expected to pay the interest while the student is enrolled.

With the Master Promissory Note the student will receive a form entitled Instructions and Notices that will describe the differences in the two loan forms, the repayment options and deferral processes in greater detail. Please read it carefully.

NON-NEED BASED PROGRAMS

Federal PLUS Loan

The PLUS loan is a loan to the parent(s) of a student; it is not the student’s loan as are the two Stafford Loans mentioned above. Parents who do not have a bad credit history can borrow a PLUS Loan to pay the education expenses of a child who is a dependent student enrolled at least half time in an eligible program at Delaware County Community College. Parents will fill out an application, which is available in the Financial Aid Office 610-359-5330. To be eligible to receive a PLUS Loan, parents generally will be required to pass a credit check. Parents cannot be turned down for having no credit history-only for having an adverse one. Parents who don’t pass the credit check might still be able to receive a loan if someone, such as a relative or friend who is able to pass the credit check, agrees to endorse the loan. An endorser promises to repay the loan if your parents fail to do so. Parents might also qualify for a loan even if they don’t pass the credit check as long as they can demonstrate that extenuating circumstances exist. Students and parents must also meet other general eligibility requirements for federal student financial aid. The yearly limit on a PLUS Loan is equal to a student’s cost of attendance minus any other financial aid. The College will receive the money in at least two installments. No one payment may exceed half of the loan amount. Parents will be required to endorse a disbursement check and send it back to the College. The college will then apply the money to your tuition, fees and other charges. If any loan money remains, parents will receive the amount as a check. The interest rate is variable (adjusted annually), but it will never exceed 9%. Parents will be notified of interest rate changes throughout the life of their loan. Interest is charged on the loan from the date the first disbursement is made until the loan is paid off. Your bank will tell you a loan repayment schedule before the loan process is completed. There is no grace period for these loans. Interest begins to accumulate at the time the first disbursement is made, and parents will begin repaying both principal and interest while their student is in school.

The PLUS Loan is a loan to the parent(s) of a student; it is not the student’s loan as are the two Stafford Loans mentioned above. Parents who do not have a bad credit history can borrow a PLUS Loan to pay the education expenses of a child who is a dependent student enrolled at least half time in an eligible program at Delaware County Community College. Parents will fill out an application, which is available in the Financial Aid Office 610-359-5330. To be eligible to receive a PLUS Loan, parents generally will be required to pass a credit check. Parents cannot be turned down for having no credit history-only for having an adverse one. Parents who don’t pass the credit check might still be able to receive a loan if someone, such as a relative or friend who is able to pass the credit check, agrees to endorse the loan. An endorser promises to repay the loan if your parents fail to do so. Parents might also qualify for a loan even if they don’t pass the credit check as long as they can demonstrate that extenuating circumstances exist. Students and parents must also meet other general eligibility requirements for federal student financial aid. The yearly limit on a PLUS Loan is equal to a student’s cost of attendance minus any other financial aid. The College will receive the money in at least two installments. No one payment may exceed half of the loan amount. Parents will be required to endorse a disbursement check and send it back to the College. The college will then apply the money to your tuition, fees and other charges. If any loan money remains, parents will receive the amount as a check. The interest rate is variable (adjusted annually), but it will never exceed 9%. Parents will be notified of interest rate changes throughout the life of their loan. Interest is charged on the loan from the date the first disbursement is made until the loan is paid off. Your bank will tell you a loan repayment schedule before the loan process is completed. There is no grace period for these loans. Interest begins to accumulate at the time the first disbursement is made, and parents will begin repaying both principal and interest while their student is in school.


Other Financial Aid Programs

Veterans Benefits

Delaware County Community College is approved for veteran’s benefits. Veterans, dependents of veterans who died of service-related injuries and children of veterans with disabilities that are total, permanent and service related may all be eligible to receive benefits. Students may inquire about their eligibility by calling the Veterans Administration at 888-442-4551 or by going to the Internet site http://www.gibill.va.gov/

Pennsylvania Army National Guard

If you join the Pennsylvania Army National Guard, they will pay all tuition and fees at Delaware County Community College. For more information go to the Internet site http://www.paguard.com/ or call 717-861-8626.

Office of Vocational Rehabilitation

This agency provides educational assistance to qualified disabled residents of Pennsylvania. For information call 610-525-1810, (610-525-5835 TTY), or visit the Internet site http://www.dli.state.pa.us/

AmeriCorps

AmeriCorps members train volunteers, tutor and mentor at-risk youth, build housing, clean up rivers and streams, help seniors live independently, provide emergency and long-term assistance to victims of natural disasters, and meet other community needs. After you successfully complete a year of AmeriCorps service, you will be eligible for an education award of $4,725. If you serve part-time, you’ll be eligible for a portion of that amount. If you already have student loans, you can use your education award to help pay them off. For more information call 215-597-2715 or visit the Internet site http://aMERICORPS.org/

Scholarships

There are a number of privately funded scholarships available to our students. Each scholarship has its own requirements and criteria for eligibility. More information can be obtained through the DCCC Educational Foundation or the Financial Aid Office. Examples of scholarships include:

American Association of University Women Scholarship
David Baldwin Memorial Endowed Scholarship
Boeing Engineering Technology Scholarship
Born Choosers Scholarship
John T. Carroll Memorial Scholarship
Charles W. Crist Memorial Scholarship
Chester Pike Rotary Club Scholarship
Kevin T. Coleman Memorial Scholarship
DCCC Alumni Legacy Scholarship
DCCC Memorial Scholarship
DCCC Student Government Association Scholarship
Delaware County Licensed Beverage Association Scholarship
J.R. Finio & Sons Scholarship
Charles Sweeney Memorial Scholarship
Sovereign Bank Scholarship
D. Barry Gibbons Scholarship
Louis W. Scott III Memorial Scholarship
Chester County Foundation Scholarship
Bob Luksa Memorial Scholarship
Richard D. DeCosmo Presidential Scholarship
Wyman’s Well Scholarship
UPS Scholarship
Mitchel Robbins Scholarship
Kreitzberg Family Endowed Scholarship
Murphey Family Scholarship
Masterson Family Scholarship
Catherine C. Mazzei Memorial Scholarship
Teresa K. Freda Endowed Scholarship
Priscilla Fox Pfizenmeyer Communication Arts Scholarship
Michael and Theresa Morochko Endowed Scholarship
Eganey-Kauffman Memorial Scholarship
Marc A. Bender Endowed Scholarship
Sunoco Process Control Technology Scholarship
Flora Music Scholarship
Marian Heisler Award
Soroptimist Scholarships
Phyllis Wexler Memorial Endowed Scholarship
Independence Nursing Foundation Scholarship
Phi Theta Kappa Scholarships

Tax Credits for Higher Education Expenses

Hope Scholarship
A Hope Scholarship Credit is not a scholarship. It is a credit against federal taxes, which may be claimed for the tuition and related expenses of each student in the taxpayer’s family (i.e., taxpayer, taxpayer’s spouse, or an eligible dependent). These students must be enrolled at least half-time in one of the first two years of post-secondary education, in a program leading to a degree, certificate, or other recognized educational credential. The amount that may be claimed is generally equal to 100% of the first $1000 of out-of-pocket expenses plus 50% of the next $1000 of out-of-pocket expenses, up to a maximum of $1500 per year per student.

Lifetime Learning Credit
The Lifetime Learning Credit is another tax credit for higher education. The amount of the credit is equal to 20% of the first $10,000 of qualified tuition and related expenses paid by the taxpayer. This tax credit is being phased in gradually. For tax years beginning before January 1, 2003, the tax credit is limited to the first $5,000 of qualified tuition and related expenses. Thus the credit is up to $1,000 through the year 2002 and $2,000 thereafter. The Lifetime Learning credit does not vary according to the number of students. This is in contrast with the HOPE tax credit, which is based on the number of eligible students in the household. This means that if you have multiple children in school at the same time and your tuition bills total more than $10,000, you only get the credit for the first $10,000 paid. You don’t get another credit for each additional child. The credit is relative to the total amount of tuition paid, irrespective of the number of children in school. Qualified tuition and related expenses includes expenses for any course of instruction at an eligible educational institution to acquire or improve job skills. This means that the credit may be used for part-time study, not just students enrolled half-time. Unlike the HOPE tax credit, the Lifetime Learning tax credit may be claimed for an unlimited number of years.

For more information about these tax credits please go to http://www.ed.gov/inits/HOPE/

Flexible Payment Options
Delaware County Community College accepts VISA, MasterCard, Discover, cash, money orders and personal checks for payment of tuition and fees.

Tuition Payment Plan
The College offers a tuition payment plan for students enrolled in credit courses, regardless of the number of credits. The date the student registers for classes determine how many payments can be arranged. A maximum of four equal monthly payments is possible. A non-refundable $30 enrollment fee will be charged to payment plan participants. For specific due dates for a particular semester contact the Cashier’s Office at 610-359-5118.
International students and students enrolled in non-credit courses are not eligible for the tuition payment plan.

Financial Aid Resources on the Internet
http://www.finaid.org
The Smart Student’s Guide to Financial Aid
A financial aid overview.

http://www.students.gov
The Student Gateway to the US Government
Federal student aid information and more.

http://www.pheaa.org
Pennsylvania Higher Education Assistance Agency
Financial Assistance for Pennsylvania Residents.

Frequently Requested Telephone Numbers
1-800-4-FED-AID (1-800-433-3243)
Federal Financial Aid
General information about federal student aid programs.

1-800-692-7435
Pennsylvania Higher Education Assistance Agency (PHEAA) Grant Division
Information about the Pennsylvania State Grant

1-800-692-7392
Pennsylvania Higher Education Assistance Agency (PHEAA) Loan Division
Information about Stafford Loan Processing.
Letter grades will be distributed at the end of each semester. Student achievement is measured by the student’s grade point average. The GPA is an indication of the quality of the work a student has done at the College in one semester.

The following letter grades are included in the computation of a student’s grade point average (GPA).

<table>
<thead>
<tr>
<th>Letter Grades</th>
<th>Meaning</th>
<th>Grade Points Per Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Excellent</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>Above Average</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>Average</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>Below Average</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>Failing</td>
<td>0</td>
</tr>
</tbody>
</table>

Letter grades that do not count in computation of a student’s GPA:

- AU . . . . Audit: The only grade given when a course is audited and carries no credit.
- CP . . . . Collegiate Partnership: Credit awarded for courses certified by DCCC faculty for which a grade equivalent of “C” or better was earned.
- IN . . . . Incomplete: This grade is given when extenuating circumstances prevent the student from completing the course work during the regular session. The incomplete work must be completed before the end of the next College session. Do not re-register for the class. “Incomplete” changes to “F” if not completed by the next semester.
- HP . . . . High Pass: The student has completed the course requirements and has demonstrated excellence in meeting the course competencies.
- P . . . . Pass: The student has completed the course requirements and has demonstrated proficiency in meeting the course competencies.
- NP . . . . No Pass: The student has not completed the course requirements and/or has not demonstrated proficiency in meeting course competencies.

**Note: Instructors of transitional and developmental courses will define in their course syllabi the grading criteria that constitute an HP, P, or NP.

IN PROGRESS GRADE FOR INDIVIDUALIZED COURSES ONLY

- IP . . . . In Progress: Only students enrolled in individualized classes may receive the IP grade. Students receiving this grade have partially met course requirements in a satisfactory manner but must re-register and pay the tuition in order to complete the course. If the student does not register and successfully complete the course in the following semester, excluding summer sessions, the IP grade will change to an NP grade.
- W . . . . Withdraw: The grade given to a student who is authorized to withdraw from a course during the authorized withdrawal period. This grade is also given when an instructor withdraws a student for poor attendance.
- T . . . . Transfer: The grade is given for a course that is transferred into the College.
- CR . . . . Credit: Credit awarded for passing courses by exam or transfer.
- NR . . . . No Record: Grade not reported by instructor.

Developmental and transitional courses will be awarded the following grades: HP, P, IP, NP, W, IN and CR.

These grades do not count in the computation of a student’s GPA.

Grade Point Average

A student’s grade point average is calculated as follows:

1. Determine the quality points earned in each course: multiply the number of points by the number of credits given for each course.
2. Divide the sum of the grade points by the total number of graded or GPA credit hours.

The result is the grade point average.

Auditing a Course

Persons eligible to enroll in a course for credit may also enroll in that course as auditors, if they receive the approval of the appropriate dean. Auditors pay the regular tuition and fee charge applicable to the credit students. They are expected to attend all lecture and laboratory classes but are not required to take examinations or submit term papers. Students auditing a course will receive only the grade of “AU” and no credit. The Petition to Audit must be submitted prior to the end of the first week of class.

Academic Bankruptcy

A student may declare academic bankruptcy for a period in his/her past that does not reflect his/her current capability for performance.

Any returning student who has not attended Delaware County Community College for two consecutive years may request that “F” and/or “D” grades of courses prior to readmission be excluded from the grade point average, although the courses and grades remain in the transcript. A written request to the Provost must specify that the student does not wish any of the excluded grades to be used in any way toward fulfilling degree requirements. The College, in return for this declaration of academic bankruptcy, will exclude grades and courses as requested. This request will be considered only after the returning student completes at least 24 credits of graded course work with a GPA of 2.7 or above.

Academic bankruptcy may be approved only once for any individual student and is irrevocable.

Delaware County Community College Policy on Student Confidentiality

As outlined in the Family Education Rights and Privacy Act (FERPA), a student has the right to have his or her educational records remain confidential. FERPA affords students certain rights with respect to their educational records. They are:

1. The right to inspect and review the student’s education records within 45 days of the day the College receives request for access.
2. The right to request the amendment of education records that students believe are inaccurate.
Students may ask the College to amend a record they believe is inaccurate or misleading. They should write to the College official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate.

FERPA was not intended to provide a process to question substantive judgments, which are properly recorded. The rights of challenge do not apply, for example, to an argument that a student deserved a higher grade in a course if the grade recorded is the grade submitted by the faculty member. See the College catalog for policies applying to grade appeals.

If the College decides not to amend the record as requested by the student, the College will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Students who wish to appeal the decision should direct their request for an appeal to the Office of the Associate Vice President for Enrollment Management. The College will provide the student with specific information regarding the hearing procedures upon the receipt of a request for a hearing.

3. The right to consent to disclosures of personally identifiable information contained in a student’s education records, except to the extent that FERPA authorizes disclosure without consent.

One exception that permits disclosure without consent is disclosure to school officials with legitimate educational interests. A school official is a person employed by the College in an administrative, supervisory, academic, research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the College has contracted (such as an attorney, auditor, collection agent, insurance agent, or official of the National Student Loan Clearing House); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks.

A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.

The College may disclose education records without consent in certain other circumstances:

- to comply with a court order or certain types of subpoenas
- to appropriate parties in a health or safety emergency
- to officials of another school, upon written request, in which a student seeks or intends to enroll
- in connection with a student’s request for or receipt of financial aid, as necessary, to determine the eligibility, amount or conditions of the financial aid, or to enforce the terms and conditions of the aid
- to certain officials of the U.S. Department of Education, the Comptroller general, to state and local educational authorities, in connection with certain state or federally supported programs
- to accrediting organizations to carry out their functions
- to organizations conducting studies for or on behalf of the College
- the results of an institutional disciplinary proceeding against the alleged perpetrator of a crime of violence may be released to the alleged victim of that crime with respect to that crime

4. The right to file a complaint with the U.S. Department of Education concerning alleged failures of the College to comply with the requirements of FERPA. Contact the office that administers FERPA at: Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Ave. SW, Washington DC, 20202-4605.

5. The College designates the following as public or Directory Information that may be released without a student’s written consent, unless the student specifies to the contrary as described below:

- student name, address, phone number and email address
- major field of study and degree sought or completed
- dates of attendance
- degrees and awards received
- expected date of completion of degree requirements and graduation
- full or part time enrollment status and classification (freshman or sophomore)
- most recent previous education agency or institution attended
- participation in officially recognized activities and sports
- height and weight of athletic team members
- date of birth

Delaware County Community College will release only the following directory information to telephonic requests: student name, degree sought or completed, expected dates of completion of degree requirements or graduation, and enrollment status.

6. Students may restrict the release of Directory Information, except to school officials with legitimate educational interest and those listed in #3 above.

A student must make the request in writing at the Student Records Office within two weeks of the beginning of the semester. Requests are valid for one year from the date of submission. Students must understand that withholding directory information prevents the College from verifying attendance or graduation to potential employers, publishing the student’s name in a graduation program or dean’s list, and makes athletes ineligible to participate in any activity requiring publication of a team roster.

For purposes of compliance with FERPA, the College considers all students independent.

Notification of Rights under FERPA

The College notifies students of their rights under FERPA through the Delaware County Community College Catalog, the Delaware County Community College Student Handbook and communications to new students from the Dean of Students Affairs. FERPA information is also on the College’s website @ www.dccc.edu.

Notice of Publication of Campus Crime Statistics and Graduation Rates

As required by the College and University Security Information Act, security information and campus crime statistics are published every year. They are also available from the Security Office.

In addition, as required by Student Right to Know legislation, graduation and transfer rates are available on the College’s Web site.
Many Delaware County Community College students transfer to four-year colleges and universities. The College’s Transfer Office is set up to help students with the transfer process. Counselors can answer your questions or guide you step-by-step through the transfer process.

Each year over 1,200 of our students transfer successfully to hundreds of colleges and universities throughout the United States.

It is important to begin planning for transfer as soon as you enroll at the College. Many courses you take will fill general education requirements for graduation at your transfer college. Depending on the major you select at your transfer institution, it will be important for you to take your prerequisites here so you can move into your chosen major with ease. The Transfer Office has transfer guides for many colleges and universities, transfer agreements with the schools most often selected for transfer by DCCC students, transfer counselors to assist with the transfer process, and a wealth of other information.

In particular, the College offers Dual Admission and Core-to-Core programs for a variety of colleges and universities within the Philadelphia, Delaware County, and Chester County areas. Dual Admission entitles students to be admitted into a bachelor’s degree program at another college or university provided they earn an approved associate’s degree from Delaware County Community College. Students who choose to participate in a Dual Admission program receive distinct advantages such as waived application fees, scholarship eligibility, and invitations to college-sponsored events. The Core-to-Core program enables our students who complete an approved A.A. or A.S. degree to satisfy the transfer institution’s general education requirements, unless a specific course or two are required. The colleges and universities that offer Dual Admission and/or Core-to-Core programs are Albright College, Alvernia College, Cabrini College, Chestnut Hill College, Eastern University, Immaculata University, Neumann College, Peirce College, Rosemont College, Saint Joseph’s University (University College), and Temple University.

In addition to the Dual Admission programs, Delaware County Community College has also created special partnerships with other colleges and universities. Strayer University offers a Guaranteed Admission agreement, Villanova University offers a Guaranteed Admission and Core-to-Core agreement (Part-Time Studies), and West Chester University offers a Letter of Intent Program.

Furthermore, the State System of Higher Education has created an Academic Passport for Pennsylvania community college students. This Passport allows graduates in college parallel majors to maximize the number of credits accepted and applied to a degree at one of the 14 universities in the State System of Higher Education.

Nine DCCC Associate degree programs are specifically designed to parallel the first two years at a four-year college or university: Behavioral Science, Business Administration, Communication, Arts, Computer Information Systems, Education, Engineering, Liberal Arts, Natural Science, and Science for Health Professions. Career programs, with planning, can also prepare students for possible transfer, including programs such as Nursing, Graphic Design, Early Childhood Education, Administration of Justice, and Hotel and Restaurant Management. It is important to know which courses in these programs will transfer. Check out the Pennsylvania Transfer and Articulation Center (www.PATRAC.org) to search for transferable courses, find information about participating institutions and get step-by-step instructions for transferring to Pennsylvania’s State Universities and Community Colleges.

Contact the Transfer Office in the Career and Counseling Center on the Main Campus at 610-359-5060. Transfer Services are also available at the Southeast Center and the Chester County locations.
These associate degree programs are designed to transfer to a bachelor’s degree at a four-year college or university. Transfer of credit to a four-year college is decided by the accepting institution. It is important that students take courses that transfer to their future major. The Transfer Office can help you select appropriate courses to meet your transfer goals.

The semester sequences listed in this section include both requirements and electives for the associate degree and are the recommended sequences for full-time study. Part-time students should take note of these sequences and meet with an advisor to plan course schedules that fulfill degree requirements and meet individual scheduling needs.

Behavioral Science, Associate in Science

The Behavioral Science program is designed for students planning to earn at least a bachelor’s degree in a behavioral science area such as anthropology, psychology or sociology. Concentration in the program develops knowledge of human thought and behavior, both individual and collective.

The Behavioral Science associate degree program is an excellent choice for students who want to gain a broad and varied educational experience as well as for those who plan in-depth study leading to a professional career.

The curriculum focuses on developing the solid foundation of knowledge, skills, attitudes and values required for transfer after completion of the associate degree. It prepares students to delve more deeply into variables such as heredity, environment and learning that influence human behavior.

Upon successful completion of this curriculum, students should be able to:
- Give a brief overview of the sciences of psychology and sociology.
- Delineate the major methodologies for studying human behavior.
- Explain the nature of the affective and cognitive domains as they apply to human behavior.
- Describe three major approaches concerning human development.
- Cite significant psychological and sociology aspects of human development from the prenatal stage through death and dying.
- Detail the socialization process.
- List the causes, classification, treatment of and social responses to mental illness disorder behavior.
- Delineate major influences that impinge socially and psychologically on the individual in today’s complex and diverse society.

General Education Core

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 100</td>
<td>English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>ENG 112</td>
<td>English Composition II</td>
<td>3</td>
</tr>
<tr>
<td>HIS 130</td>
<td>Western Civilization I</td>
<td>3</td>
</tr>
<tr>
<td>HIS 140</td>
<td>Western Civilization II</td>
<td>3</td>
</tr>
<tr>
<td>COMM 100</td>
<td>Introduction to Interpersonal Commun.</td>
<td>3</td>
</tr>
<tr>
<td>Humanities</td>
<td>Elective</td>
<td>9</td>
</tr>
<tr>
<td>*Lab Science</td>
<td>Elective</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics</td>
<td>Elective</td>
<td>6-10</td>
</tr>
<tr>
<td>Open Elect.</td>
<td>(SOC &amp; PSY)</td>
<td>6</td>
</tr>
<tr>
<td>Anthropology</td>
<td>Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours Required: 44-48

Behavioral Science Core

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 140</td>
<td>General Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 215/</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>PSY 225</td>
<td>Experiences in Diversity</td>
<td>3</td>
</tr>
</tbody>
</table>

Any three courses (nine credits) in one of the following areas:

Anthropology Option (BANT)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 180</td>
<td>Sociology of Marriage and the Family</td>
<td>3</td>
</tr>
<tr>
<td>SOC 210</td>
<td>Cultural Anthropology</td>
<td>3</td>
</tr>
</tbody>
</table>

And any two of the following three courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUM 160</td>
<td>Introduction to World Religions</td>
<td>3</td>
</tr>
<tr>
<td>HUM 171</td>
<td>Western Myths</td>
<td>3</td>
</tr>
<tr>
<td>HUM 173</td>
<td>Eastern Mythology</td>
<td>3</td>
</tr>
</tbody>
</table>

Psychology Option (BPSY)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 200</td>
<td>Personality Theories</td>
<td>3</td>
</tr>
<tr>
<td>PSY 215</td>
<td>Industrial Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 220</td>
<td>Abnormal Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 221</td>
<td>Social Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 235</td>
<td>Educational Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

But no more than three credits from the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 210</td>
<td>Lifespan Human Development</td>
<td>3</td>
</tr>
<tr>
<td>PSY 241</td>
<td>Child Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 290</td>
<td>Adulthood and Aging</td>
<td>3</td>
</tr>
</tbody>
</table>

Sociology Option (BSOC)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 120</td>
<td>Social Problems</td>
<td>3</td>
</tr>
<tr>
<td>SOC 180</td>
<td>Sociology of Marriage and the Family</td>
<td>3</td>
</tr>
<tr>
<td>SOC 210</td>
<td>Cultural Anthropology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 220</td>
<td>Social Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

Business Administration, Associate in Science

The Business Administration program provides students with the necessary courses to transfer to a four-year college or university to pursue a baccalaureate degree in business. Students in this program may prepare for specialization in accounting, international business, economics, finance, human resource management, management, marketing, or other related careers. Students enrolled in this program are strongly encouraged to consult the Transfer Office as early as possible to ensure choosing electives that will be most acceptable to transfer institutions. The Associate in Science degree is awarded at the completion of the program.

Upon successful completion of this curriculum, students should be able to:
- Record financial transactions, perform calculations, and prepare financial statements in accordance with the principles and concepts established by the Financial Accounting Standards Board and the Internal Revenue Service.
- Analyze and interpret financial statements.
• Discuss how financial statements and other accounting information are used by management to plan, control, and make discussions about business.
• Use computer terminology when discussing business computer applications.
• Demonstrate fundamental software, applications skills in word processing, spreadsheets, presentation software, database management, communication, and research.
• Discuss the business skills and common body of knowledge necessary for future study in the areas of management, marketing, finance, accounting, and management information systems.
• Discuss fields of specialization in the areas of business administration.
• Develop a perspective toward leadership, human behavior, and ethical principles in business.
• Apply basic economic principles in the business decision-making process.

General Education (42-45 Core Credits)

ENG 100  English Composition I .............................. 3
ENG 112  English Composition II ............................ 3
ECO 210  Macroeconomics .................................... 3
ECO 220  Microeconomics ..................................... 3
______ History or Foreign Language ......................... 6
______ Science Electives ........................................ 7-8
______ Mathematics Sequence Electives .................... 6-10
______ Social Science Elective ............................... 3
______ Humanities Elective .................................... 3
______ Social Science or Humanities Elective .............. 3

40-45

Business Core (9 Credits)

ACC 111  Financial Accounting ............................... 3
ACC 112  Managerial Accounting ............................ 3
DPR 100  Introduction to Computers ........................ 3

9

Accounting Option (BUAC) (12 Credits)

ACC 115  Computerized Accounting .......................... 3
BUS 232  Principles of Finance ................................ 3
______ Business Elective ........................................ 3
______ Business Elective ........................................ 3

12

Marketing Option (BUMR) (12 Credits)

BUS 230  Principles of Marketing ............................. 3
BUS 231  Principles of Advertising ........................... 3
______ Business Elective ........................................ 3
______ Business Elective ........................................ 3

12

Management Option (BUMG) (12 Credits)

BUS 210  Principles of Management .......................... 3
BUS 215  Human Resource Management .................... 3
______ Business Elective ........................................ 3
______ Business Elective ........................................ 3

12

General Business Option (BUAD) (12 Credits)

______ Business Elective ........................................ 3
______ Business Elective ........................................ 3
______ Business Elective ........................................ 3
______ Business Elective ........................................ 3

12

Sports Management Option (BUSS) (12 Credits)

BUS 232  Introduction to Sports Management ................ 3
BUS 236  Principles of Sport Marketing ..................... 3
BUS 199  Co-op Internship or Business Elective ............. 3
______ Business Elective ........................................ 3

12

Total Hours Required: 61-66

NOTE: Students who have had experience in the above areas may be awarded credit through the College's Credit for Prior Learning program. Business electives for this degree should be chosen from the following courses: BUS 210, BUS 100, BUS 101, BUS 111, BUS 130, BUS 199, BUS 210, BUS 211, BUS 212, BUS 214, BUS 215, BUS 220, BUS 230, BUS 231, BUS 232, BUS 236, BUS 241, BUS 243, DPR 105, DPR 111 and DPR 113.

Under special circumstances, other courses in accounting, business and computer information systems may be permitted as electives when recommended by the advisor and approved by the Associate Dean, Business/Computer Information Systems.

Mathematics courses chosen should be in one of the following sequences to meet requirements for the associate in science degree: MAT 130 and 131, MAT 140 and 141 or MAT 160 and 161. Most four-year colleges prefer the MAT 130 and MAT 131 sequence for business majors.

The General Business Option should be selected by students transferring to four-year colleges accredited by the American Assembly of Collegiate Schools of Business. Students should check with their advisor or the Transfer Office for a list of these schools. We recommend that students become familiar with program requirements of the transfer institution they plan to attend.

Communication Arts, Associate in Arts

This curriculum is designed for students who wish to continue academic study in the field of communication including, but not limited to, theatre, journalism, public relations, advertising, interpersonal communication, corporate communication and mass communication. The Communication Arts major at Delaware County Community College blends the theoretical with the practical. Students must choose an option within the major: theatre, journalism or communication studies.

All Communication Arts majors take core courses required for the associate in arts degree as well as for the bachelor of arts degree from most transfer institutions. In addition, students select specialized courses and related electives. When selecting Communication Arts electives, the student should consult four-year transfer institution requirements.

Upon completion of this curriculum, students should be able to:
• Apply the basic theory and principles of human communication.
• Communicate effectively using critical thinking and organization.
• Describe the impact of communications practitioners and recognize the moral and ethical responsibilities inherent in the application of communication theory and technology.
• Recognize the varied contributions made by the objective observer & recorder.
• Demonstrate the importance of the artist and the arts to American culture.
• Develop and employ a perspective on the present through the study of ancient and past civilizations and cultures.

All Communication Arts students are required to take the general education course core courses listed below. These courses are necessary for transfer since they form the basis for all Communication Arts degree requirements. In addition, students select 12 credits from those courses required or recommended for the students' chosen option. When carefully chosen, the general humanities, social science, science/math and open electives provide the foundation necessary for success in an advanced transfer program.

General Education Core (60-66 Credits)

ENG 100  English Composition I .............................. 3
ENG 112  English Composition II ............................ 3
HIS 130  Western Civilization I ............................. 3
HIS 140  Western Civilization II ............................ 3
COMM 100  Introduction to Interpersonal Communication . 3
COMM 104  Introduction to Mass Communication ......... 3
______ Humanities (Foreign Language courses strongly recommended) .......... 12
______ Science or Mathematics Electives .................. 9-15
______ Social Science Electives ............................. 6
______ Open Elective .......................................... 3
______ Option Requirements and Option Electives .......... 12

60-66
Communication Arts Degree Program

1. Theatre Option (THEA): Students will select from the following courses to meet the option requirement and prepare for a theatre degree in performance, design, direction, administration, or education. Although these courses are oriented primarily toward stage performance, they apply to television and film as well. Students enrolled in the theatre option, in order to graduate, will participate in at least one Delaware County Community College drama presentation.

   Students select from the following courses to meet the Theatre Option requirements: 12 credits
   DRA 100 Introduction to Theatre (Required)
   DRA 110 Acting I (Required)
   DRA 111 Acting II
   DRA 112 Voice Enhancement
   DRA 115 Set Design and Construction
   DRA 120 Theatre Make-Up
   DRA 200 Modern Drama
   ENG 222 Introduction to Shakespeare
   HUM 141 Film Language
   HUM 142 American Cinema
   MUS 127 Survey of American Musical

   Students may also select from the above courses to meet humanities and open elective requirements.

II. Journalism Option (JOUR): This option is intended to prepare students for a career in the print media field. Students contemplating a career in newspaper writing, photojournalism, public relations, and newswriting for the electronic media should elect this option.

   Students select from the following courses to meet the Journalism Option requirements: 12 credits
   ENG 130 Fundamentals of Journalism I (Required)
   ENG 131 Fundamentals of Journalism II (Required)
   ENG 205 Creative Writing
   ART 160 Black and White Photography I
   ART 161 Black and White Photography II
   ART 162 Black and White Photography III
   ART 166 Black and White Digital Negative
   ART 169 Medium and Large Format Photography
   BUS 231 Principles of Advertising
   COMM 115 Introduction to Public Relations

   Students may also select from the above courses to meet humanities and open elective requirements.

III. Communication Studies Option (COMM):

   This concentration is designed for students interested in pursuing an undergraduate degree in Communication Studies. Completing this option prepares students for further study at the baccalaureate level or for career enhancement.

   Students must complete 6 credits in speech communication (COMM) and 6 additional credits from the following list to meet the Communication Studies Option: 12 credits
   COMM 105 Small Group Communication
   COMM 111 Public Speaking
   COMM 115 Introduction to Public Relations
   COMM 200 Argumentation and Debate
   HUM 141 Film Language
   HUM 142 American Cinema
   BUS 230 Principles of Marketing
   BUS 231 Principles of Advertising

   Students may also select from the above courses to meet humanities and open elective requirements.

First Semester
   ENG 100 English Composition I ............................................. 3
   COMM 100 Introduction to Interpersonal Communication ............. 3
   HIS 130 Western Civilization I ............................................. 3
   ________ Humanities or Foreign Language Elective ..................... 3-5
   ________ Science or Mathematics Elective ............................ 3

   Total Hours Required 15-17

Second Semester
   ENG 112 English Composition II ......................................... 3
   HIS 140 Western Civilization II ......................................... 3
   COMM 104 Introduction to Mass Communication ....................... 3
   ________ Open Requirement or Option Elective ....................... 3
   ________ Humanities or Foreign Language Elective .................. 3
   ________ Science or Mathematics Elective ............................ 3

   Total Hours Required 15

Third Semester
   ________ Option Requirements or Option Electives .................... 6
   ________ Humanities or Foreign Language Elective .................. 3
   ________ Social Science Elective ......................................... 3
   ________ Science or Mathematics Elective ............................ 3

   Total Hours Required 15-17

Fourth Semester
   ________ Option Requirements or Option Elective .................... 3
   ________ Humanities or Foreign Language Elective .................. 3
   ________ Social Science Elective ......................................... 3
   ________ Open Elective ...................................................... 3
   ________ Science or Mathematics Elective ............................ 3

   Total Hours Required 15

Total Hours Required 60-66

Computer Information Systems, Associate in Science (DPRS)

The curriculum in Computer Information Systems is a two-year program for students who plan to continue their studies toward the bachelor's degree at a four-year college or university. Students in this major apply their knowledge of computer science to the world of business and industry. Programs at four-year institutions may be listed as Computer Science, Computer Information Systems, Computer Information Science, Management Information Systems or Information Technology. The associate in science degree will be awarded upon successful completion of this program.

Upon successful completion of this curriculum, students should be able to:
   • Analyze problems in terms of the requirements of the computer and the business or industry results required.
   • Use detailed program logic to solve business and industry problems.
   • Develop detailed business computer applications programs using popular computer languages and provide documentation for the programs.
   • Use debugging techniques, a computer system library, software aids and utilities in the development of computer applications programs.
   • Communicate effectively using appropriate business and computer terminology in a business or industry environment.
   • Maintain general accounting records for a department within a business organization.
   • Discuss the economic environment in which business function.
   • Discuss the relationship between the information technology department and other departments in a business.

See Electives Listing, page 73.
First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
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<tbody>
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<td>ENG 100</td>
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<tr>
<td>BUS 100</td>
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<td>MAT 130*</td>
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<td>DPR 108</td>
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Total: 16

Second Semester

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<td>MAT 131*</td>
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<td>DPR 222</td>
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Total: 15

Third Semester

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<td>DPR 212</td>
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Total: 15

Fourth Semester

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<th>Course</th>
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<td>ECO 220</td>
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<td>DPR 105</td>
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<td></td>
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</tbody>
</table>

Total: 15

Total Hours Required: 63

*Students are required to take two sequential mathematics courses. The following sequential mathematics courses may be substituted: MAT 150 and MAT 160 and MAT 161.

Education, Associate in Arts (EDUC)

The Education curriculum was developed to meet the needs of current and prospective students interested in transferring to a four-year institution for the purpose of receiving a PA Public School Teacher’s Certification. Areas of certification include ECE, elementary, secondary, special ed, or any combination of any of these two majors. Among colleges and universities there are variances within the first two years at some schools contingent upon the area of PA Public School Certification pursued. Additionally, each of these areas of certification involve different course selections. All of these conditions necessitate working closely with a transfer counselor in the Career and Counseling Center to ensure a seamless transfer process to a four-year institution. Reports from DCCC’s Career and Counseling Center regarding appropriate course for the Transfer Institution.

Education program. It is recommended that students prepare and take the PRAXIS exam requirements. Information may be obtained from the Career and Counseling Center.

This curriculum is designed for students transferring to a four year degree in education. All education majors should apply to the four-year college or university up to one year before they plan to attend. Most colleges and universities require a 3.0 or higher grade point average to be accepted into the Education program. It is recommended that students prepare and take the PRAXIS test after 45 credits.

Engineering, Associate in Science Degree (EGR)

The Engineering program is a two-year preparatory curriculum for students who plan to continue their education at a four-year institution and complete their major in an engineering science field.

Upon successful completion of this curriculum, students should be able to:

- Determine the specifications and parameters of engineering problems.
- Apply physical principles and laws to engineering problems.
- Apply modern analytical tools to engineering problems.
- Present technical information in oral, written or graphic form.
- Identify cultural, social and personal factors influencing engineering professions and career development.

Proposed Curriculum

**First Semester (15 Credits)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
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<td>PSY 140</td>
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<td>DPR 100</td>
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<th>Course</th>
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<tr>
<td>English Composition I</td>
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<tr>
<td>General Psychology</td>
<td>3</td>
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<tr>
<td>Introduction to Computers</td>
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<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics/Science Electives</td>
<td>9</td>
</tr>
<tr>
<td>Social Science Elective</td>
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</table>

**Second Semester (17 Credits)**

<table>
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<th>Credits</th>
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<tbody>
<tr>
<td>ENG 112</td>
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</tr>
<tr>
<td>EGR 150</td>
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<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>English Composition II</td>
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</tr>
<tr>
<td>Engineering Topics</td>
<td>1</td>
</tr>
<tr>
<td>Mathematics/Science Electives</td>
<td>13</td>
</tr>
</tbody>
</table>

*Math, Social Science and Public Speaking requirements vary considerably among transfer institutions. Students should consult the Career and Counseling Center regarding appropriate course for the Transfer Institution.

Hours: 29
Third Semester (16-18 Credits)

- Engineering Curriculum Options .............................. 6-8
- Mathematics/Science Electives .............................. 7
- Social Science Elective ...................................... 3

Fourth Semester (15-17 Credits)

- Engineering Curriculum Option .............................. 3-5
- Humanities Electives (2) ...................................... 6
- Mathematics/Science Elective .............................. 3
- Social Science Elective ...................................... 3

Total Hours Required: 63-67

*Students in the Computer Option should take DPR 108 in the first year.

Liberal Arts, Associate in Arts (LA)

The Liberal Arts curriculum provides the core liberal arts component of most bachelor's degree programs and prepares students for transfer to four-year colleges or universities. This program offers a course of study for students whose goal is an undergraduate degree in areas such as: education, foreign language, communications, the social and behavioral sciences, philosophy and the arts. Since curriculum requirements of other institutions vary, students should meet with a transfer advisor at DCCC to obtain information concerning entrance requirements for the specific school and program in which they are interested.

Upon successful completion of this curriculum, students should be able to:

- Demonstrate an ability to evaluate, analyze and synthesize ideas gained through interaction with a variety of sources.
- Use research methods and documentation skills to collect, organize and present data.
- Organize a series of logically developed ideas with a thesis leading to a reasonable conclusion.
- Employ standard English usage to present assertions in oral and written form.
- Apply critical thinking and information literacy skills to understand concepts in the arts, literature, natural and social sciences, business and mathematics.

Students considering an advanced degree in education, behavioral science or communication arts should also review the DCCC catalog for these degree programs. Successful completion of Delaware County Community College's Liberal Arts program leads to the awarding of an Associate in Arts degree.

Open Electives must be selected from the college-transfer courses on Electives Listing on Page 70.

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 100 English Composition I</td>
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</tr>
<tr>
<td>HIS 130 Western Civilization I</td>
<td>3</td>
</tr>
<tr>
<td>COMM 100 Introduction to Interpersonal Communication</td>
<td>3</td>
</tr>
<tr>
<td>*Mathematics Elective</td>
<td>3-5</td>
</tr>
<tr>
<td>Open Elective</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENG 112 English Composition II</td>
<td>3</td>
</tr>
<tr>
<td>HIS 140 Western Civilization II</td>
<td>3</td>
</tr>
<tr>
<td>Foreign Language or Other Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td>*Mathematics Elective</td>
<td>3-5</td>
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<tr>
<td>Open Elective</td>
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Third Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>HIS 110 American History I (or)</td>
<td>3</td>
</tr>
<tr>
<td>HIS 120 American History II</td>
<td>3</td>
</tr>
<tr>
<td>POL 120 American National Government (or)</td>
<td>3</td>
</tr>
<tr>
<td>POL 130 American State and Local Government</td>
<td>3</td>
</tr>
<tr>
<td>Foreign Language or Other Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td>*Natural Science Elective</td>
<td>4</td>
</tr>
<tr>
<td>Open Elective</td>
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</table>

Fourth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign Language or Other Humanities Language</td>
<td>3</td>
</tr>
<tr>
<td>*Natural Science Elective</td>
<td>4</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Open Elective</td>
<td>6</td>
</tr>
</tbody>
</table>

Co-op/Internship or Equivalent: 3 if possible

Total Hours Required: 62-66

*Natural science/math electives must total a minimum of 14 credits and must be achieved by taking MAT 120 and MAT 121 or higher-level math and two laboratory science courses.

Suggested **Engineering Curriculum Option Electives**, by transfer discipline:

(Select any three courses.) Students are strongly encouraged to consult with both the DCCC Transfer Office as well as their academic advisor prior to selecting Engineering Curriculum Option courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Chemical</th>
<th>Civil</th>
<th>Computer</th>
<th>Electrical</th>
<th>Mechanical</th>
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<tr>
<td>CHE 200 Organic Chemistry I</td>
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<td>CHE 201 Organic Chemistry II</td>
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<tr>
<td>DPR 108 Intro. to Computer Science</td>
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<td>DPR 212 Data Structures &amp; Algorithms</td>
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<td>DPR 226 Object Oriented C++</td>
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<tr>
<td>EGR 100 Engineering Graphics</td>
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<td>EGR 200 Engineering Mechanics I</td>
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<td>EGR 210 Engineering Circuits</td>
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<td>EGR 220 Engineering Thermodynamics</td>
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<tr>
<td>MAT 200 Linear Algebra</td>
<td></td>
<td></td>
<td>x</td>
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</table>
Natural Science, Associate in Science (NSCI)

The Natural Science curriculum is designed to prepare students to continue study at four-year institutions in fields such as biology, microbiology, chemistry, and physics. The curriculum provides an academic foundation to prepare students for careers in areas such as molecular biology, biotechnology, ecology, industrial chemistry, chemical technology, medicine, dentistry, pharmacy, wildlife biology, and secondary education.

Upon successful completion of this curriculum, students should be able to:
• Demonstrate an understanding of scientific principles and concepts.
• Apply scientific principles and concepts in the solution of problems and experiments.
• Perform selected tasks relative to laboratory experiments in the natural sciences.
• Use information from scientific literature in completing course competencies.
• Interpret scientific data according to established standards.

See Electives Listing, page 73.

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 100 English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>__________ Laboratory Science Electives</td>
<td>8</td>
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<tr>
<td>__________ *Mathematics Electives</td>
<td>3-5</td>
</tr>
<tr>
<td>__________ Social Science Elective</td>
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</table>

17-19

Second Semester

<table>
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<td>ENG 112 English Composition II</td>
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<td>3-5</td>
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<td>__________ Social Science Elective</td>
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17-19

Third Semester

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<tr>
<td>__________ Communications/Humanities Elective</td>
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<td>__________ Business or Social Science Elective</td>
<td>3</td>
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<tr>
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13-16

Fourth Semester

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<tbody>
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<td>__________ Laboratory Science Electives</td>
<td>4-5</td>
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<tr>
<td>__________ Communications/Humanities Elective</td>
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<td>__________ Social Science Elective</td>
<td>3</td>
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<tr>
<td>__________ **Mathematics or Laboratory Science Elective</td>
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13-16

Total Hours Required: 60-70

*MAT 140 or above. If Calculus I and Calculus II (MAT 160 and MAT 161) are taken in the first and second semesters, the social science electives should be deferred until the third and fourth semesters.

**Not an open elective.

Science for Health Professions, Associate in Science (HSCI)

This program is designed for students who plan to transfer and continue their education in an allied health field at another institution. It provides the basic sciences needed for a variety of such programs, including Baccalaureate Nursing, Physical Therapy, Occupational Therapy, Physician Assistant and Pharmacy. Since admission requirements to other institutions vary, students should obtain information on entrance requirements for the specific school and program in which they are interested. Students are strongly encouraged to consult with both the Transfer Office at DCCC and their advisor regarding the best course selections for their transfer.

Upon successful completion of this curriculum, students should be able to:
• Use mathematics, read, write and speak in a manner consistent with his or her chosen health science career.
• Use the scientific method to gather data, interpret data and draw conclusions.
• Demonstrate laboratory skills, in basic sciences.
• Access printed and electronic resources to obtain information.
• Demonstrate cognitive and affective skills needed to respond to continuous changes and challenges in health science professions.
• Demonstrate the ability to approach current societal issues from a scientific perspective.
• Use cooperative skills to solve problems.

Requirements

<table>
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<tbody>
<tr>
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<tr>
<td>English Composition II</td>
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</tr>
<tr>
<td>Social Science Elective</td>
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<tr>
<td>Social Science/Business Electives</td>
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Recommended: PSY 140, DPR 100

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<td>Mathematics Electives</td>
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<td>Mathematics/Science Electives</td>
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Select from: MAT 140 or above (minimum 3 credits required) BIO 110, 111, 115, 117, 118, 200, 210, 220, 230, CHE 110 or above, PHY 110 or above

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<td>Mathematics or Laboratory Science Elective</td>
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<tr>
<td>Mathematics/Science Elective</td>
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Select from: MAT 140 or above (MAT 210 recommended), BIO 100 or above, CHE 106 or above, SCI 100

<table>
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<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>Open Electives</td>
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See Electives Listing, page 73

First Semester

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</thead>
<tbody>
<tr>
<td>ENG 100 English Composition I</td>
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<tr>
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<td>Laboratory Science Elective</td>
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<td>Mathematics Elective</td>
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16-18

Second Semester

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<tbody>
<tr>
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<td>Humanities Elective</td>
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<tr>
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<tr>
<td>Mathematics Elective</td>
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<td>Open Elective</td>
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16-17

Third Semester

<table>
<thead>
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<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Mathematics or Laboratory Science Elective</td>
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<td>Open Electives</td>
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14-17

Fourth Semester

<table>
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<tr>
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</tr>
<tr>
<td>Open Elective</td>
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</tr>
</tbody>
</table>

14-15

Total Hours Required 60-67
These associate degree programs are designed to prepare the student for the workplace.

The semester sequences listed in this section include both requirements and electives for the associate degree and are the recommended sequences for full-time study. Part-time students should take note of these sequences and meet with an advisor to plan course schedules that fulfill degree requirements and meet individual scheduling needs.

**Accounting, Associate in Applied Science (ACCT)**

The career program in Accounting prepares students for various entry-level positions in the field of accounting. It is strongly recommended that students who plan to pursue further studies at a four-year institution immediately after graduation take the Business Administration with the Accounting Concentration program.

Upon successful completion of this program, students should be able to:

- Perform all steps in the accounting cycle for business entities.
- Compute and record those amounts arising from representative transactions unique to partnerships or corporations.
- Analyze financial statements, recognize potential problem areas, and suggest appropriate actions to alleviate or eliminate problems.
- Prepare a federal income tax return and other tax forms for representative individuals including the person who is operating the business as a single proprietorship.
- Record representative cost accounting transactions and subsequently reflect the effect of these transactions in appropriate financial statements.
- Recognize special needs of businesses and design the records required to meet such needs.
- Prepare financial forecasts based on information from both internal and external sources.
- Prepare cash budgets.
- Prepare production budgets and subsequent variance reports.
- Demonstrate a knowledge of capital budgeting.
- Discuss the importance of ethical behavior in business operations.
- Demonstrate efficient utilization of appropriate accounting software.
- Apply basic economic principles in the business decision-making process.

See Electives Listing, Page 70.

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 100 English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 105 Business Math</td>
<td>3</td>
</tr>
<tr>
<td>BUS 100 Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>ACC 111 Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>DPR 100 Introduction to Computers</td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>ENG 112 English Composition II</td>
<td>3</td>
</tr>
<tr>
<td>ACC 112 Managerial Accounting</td>
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<tr>
<td>ACC 115 Computerized Accounting</td>
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<tr>
<td>BUS 243 Legal Environment of Business</td>
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<table>
<thead>
<tr>
<th>Third Semester</th>
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<tbody>
<tr>
<td>ACC 201 Introduction to Cost Accounting</td>
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<tr>
<td>ACC 202 Introduction to Tax Accounting</td>
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<tr>
<td>BUS 130 Business Communications</td>
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<td>Social Science Elective</td>
<td>3</td>
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<tr>
<td>Science Elective</td>
<td>4</td>
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<tr>
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<tbody>
<tr>
<td>*Accounting/Business Elective</td>
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<td>Humanities Elective</td>
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<tr>
<td>BUS 199 Co-op/Internship or Business Elective</td>
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<tr>
<td>Open Electives</td>
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<tr>
<td></td>
<td>15-16</td>
</tr>
</tbody>
</table>

Total Credits Required: 62-63

Students who have had experience in the above areas may be awarded credit through the College’s Credit for Prior Learning program.

*Recommended BUS/DPR courses from which the student should select are: Advanced Office (DPR 111), Data Base-Access (DPR 113), Principles of Management (BUS 210), Supervision (BUS 211), Organizational Behavior (BUS 214), Human Resource Management (BUS 215), Business Statistics (BUS 220), Principles of Marketing (BUS 230), Principles of Advertising (BUS 231), Principles of Finance (BUS 232). Applied Accounting (ACC 100) MAY NOT BE USED to meet any elective requirement in the program. A certificate in Professional Accounting is also available.

**Administration of Justice, Associate in Applied Science (ADJ)**

The Administration of Justice program gives students a broad perspective on the justice system. The program is designed to meet the educational needs of professionals who seek specific knowledge and skills for career enhancement as well as those seeking entry-level employment in a variety of areas within the justice system.

There are two elective options that give students the opportunity for career exploration: The Law Enforcement option focuses on contemporary police services, police-personnel supervision and traffic-accident reconstruction. The Corrections and Judicial option explores corrections, probation and parole; alternatives to incarceration; and community relations and the justice practitioner. The program serves as a respected and acceptable pre-law degree after continuing studies in a four-year degree program are completed. The program courses are of high transfer acceptability to most four-year Justice Studies programs.

Upon successful completion of this program, students should be able to:

- Identify the basic principles and procedures that govern the administration of justice in the American society.
- Describe the major systems that deal with the administration of justice in America.
- Define the principles and procedures involved in effective criminal investigation.
- Explain the fundamental concepts and principles of management employed in effective administration of justice.
- Develop strong observational and reporting skills.
- Critique policies and operations of criminal justice organizations constructively.
- Interpret legal safeguards guaranteed by the U.S. Constitution and other statutes.
- Respect the dignity and humanity of both victim and perpetrator of crime.
• Demonstrate the importance of personal integrity and ethical behavior within the criminal justice system.
• Evaluate crime causality and its relationship to the Administration of Justice.
• Comprehend the role of technology in the Administration of Justice.

See Electives Listing, Page

### First Semester Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 100</td>
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</tr>
<tr>
<td>ADJ 101</td>
<td>3</td>
</tr>
<tr>
<td>ADJ 110</td>
<td>3</td>
</tr>
<tr>
<td>DPR 100</td>
<td>3</td>
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<tr>
<td>SOC 100</td>
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<td>SOC 110</td>
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Total Credits Required: 15

### Second Semester Credits

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
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</tr>
<tr>
<td>ADJ 111</td>
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</tr>
<tr>
<td>ADJ 120</td>
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<td>ADJ 240</td>
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<td>PSY 140</td>
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Total Credits Required: 15

### Third Semester Credits

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<td>3</td>
</tr>
<tr>
<td>HIS 120</td>
<td>3</td>
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<tr>
<td>Math/Science Elective</td>
<td>3-4</td>
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<td>ADJ Elective</td>
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<td>Humanities Elective</td>
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Total Credits Required: 15-16

### Fourth Semester Credits

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Math/Science Elective</td>
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<tr>
<td>ADJ 261</td>
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<td>POL 100</td>
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<td>POL 130</td>
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<td>ADJ 199</td>
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<tr>
<td>Social Science Elective</td>
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Total Credits Required: 15-16

Total Credits Required: 60-62

Students who have experience in the above areas may be awarded credit through the College's Credit for Prior Learning program.

It is highly recommended that students intending to transfer to a four-year institution to pursue a Bachelor’s degree in Administration of Justice consult with a transfer counselor to insure that the institution to which the student is intending to transfer will accept the courses the student has selected.

### Architectural Technology, Associate in Applied Science (ARC)

The associate degree program in Architectural Technology prepares students for entry-level employment in professional offices, industries and businesses related to the architectural and building fields. Professional registration is available through continued education.

Upon successful completion of this program, students should be able to:
• Demonstrate knowledge of two- and three-dimensional design processes.
• Interpret architectural drawings.
• Demonstrate knowledge of sketches and technical drawings for basic structures.
• Understand and demonstrate knowledge of various building materials and methods of construction.
• Develop drawings using computer-aided drafting equipment.
• Contrast alternate mechanical/electrical systems relating to architectural design and discuss how they relate to a responsible attitude toward wise and efficient use of resources.
• Demonstrate knowledge of fundamental theory and skills in verbal, written and visual communications.
• Analyze the mechanics of a structural design.

The associate degree in applied science will be awarded after satisfactory completion of the four-semester program.

### First Semester Credits

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<td>*MAT 110</td>
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<tr>
<td>TCC 111</td>
<td>3</td>
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<td>TCC 112</td>
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<td>TCS 100</td>
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Total Credits Required: 16

### Second Semester Credits

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<td>PHY 100</td>
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<td>TCC 121</td>
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<tr>
<td>TCC 122</td>
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<td>ARC 121</td>
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Total Credits Required: 16

### Third Semester Credits

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<tr>
<td>PHY 101</td>
<td>3</td>
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<tr>
<td>TME 216</td>
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<tr>
<td>TCS 111</td>
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<td>ARC 215</td>
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Total Credits Required: 16

### Fourth Semester Credits

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<td>ARC 221</td>
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<td>ARC 226</td>
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<td>TCC 228</td>
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<tr>
<td>ARC 199</td>
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</tbody>
</table>

Total Credits Required: 15

*MAT 140, MAT 141 or MAT 160, MAT 161 may be elected instead.

### Automated Manufacturing/Robotics Technology, Associate in Applied Science (ROBO)

The Automated Manufacturing/Robotics Technology program is designed to prepare students for various fields within the manufacturing industry. Specific courses offer basic instruction in Computerized Numerically Controlled (CNC) programming of machine tools, integration of electro/mechanical systems for automation projects as well as the development of robotic work cells.

Upon successful completion of this program, students should be able to:
• Set up and operate conventional and computer numerically controlled machine tools.
• Prepare manual and computer-assisted programs for directing the operation of numerically controlled machine tools.
- Describe the structural and functional characteristics of various types of robots and automated systems.
- Define accident prevention procedures associated with the operation of automated equipment.
- Explain the aspects of flexibility associated with computerized automated systems.
- Identify methods and equipment needed to integrate a robotic work cell, or an automated system.
- Develop, write and modify programmable controller networks.
- Integrate automated materials handling, assembly, manufacturing and transfer equipment within a work cell.
- Document automation specifications in textual and graphical format.

### First Semester

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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</tr>
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<tbody>
<tr>
<td>ENG 110</td>
<td>English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>*MAT 110</td>
<td>Technical Mathematics I</td>
<td>4</td>
</tr>
<tr>
<td>TCC 111</td>
<td>Technical Communication</td>
<td>3</td>
</tr>
<tr>
<td>TCC 112</td>
<td>2-D CADD</td>
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<tr>
<td>TME 111</td>
<td>Machining Technology</td>
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**First Semester Credits:** 16

### Second Semester

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<th>Course Title</th>
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<tr>
<td>*MAT 111</td>
<td>Technical Mathematics II</td>
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<tr>
<td>PHY 100</td>
<td>Technical Physics I</td>
<td>3</td>
</tr>
<tr>
<td>TCC 121</td>
<td>Project Management Processes</td>
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<td>TCC 122</td>
<td>Two-Dimensional CADD</td>
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<td>TEL 101</td>
<td>DC Analysis</td>
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<tr>
<td>TDD 128</td>
<td>Detailing-Assembly Fixture Design</td>
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**Second Semester Credits:** 16-17

### Third Semester

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<tr>
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<th>Course Title</th>
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<tr>
<td>ENG 112</td>
<td>English Composition II</td>
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<td>PHY 101</td>
<td>Technical Physics II</td>
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<tr>
<td>TME 210</td>
<td>CNC Operations</td>
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<tr>
<td>TDD 216</td>
<td>Three-Dimensional CADD (or)</td>
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<td>TEL 200</td>
<td>Electro/Mechanical Systems</td>
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<tr>
<td>TME 212</td>
<td>Computer/Aided Machining</td>
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**Third Semester Credits:** 15

### Fourth Semester

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<td>Robotics and Programmable Controllers</td>
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<td>TME 222</td>
<td>Advanced Computer Aided Machining</td>
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<tr>
<td>TME 229</td>
<td>Fluid Power and Controls</td>
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</tbody>
</table>

**Fourth Semester Credits:** 16

**Total Credits Required:** 63-64

*MAT 140, MAT 141 or MAT 160, MAT 161 may be elected instead.

### Automotive Technology, Associate in Applied Science (AUTO)

The Associate in Applied Science degree program will prepare students for immediate career opportunities. The program is designed to provide the broad academic, technical education that is necessary to function in today’s automotive service industry. This program includes fundamental, basic, intermediate and advanced theories for testing, diagnosing malfunctions, evaluating and repairing automotive systems and components. Students will learn to apply new skills in specialized service work, business management, communications, decision-making, and social work habits. Career opportunities are unlimited within the automotive industry. Employment classification includes but is not limited to, automotive technicians, skilled in many areas and/or specializing in one or more areas of diagnosis and repair.

Other possible career paths include shop supervisor, service manager, parts managers, service writers, service dispatcher, auto sales person, automotive instructors, automotive company instructors, and parts line instructors.

With today’s increase of electronic components used on the automobile and the projected increase of electronics in the years to come, it is imperative that entering students have a background in electricity, mathematics, business skills, computer science and an understanding of the English language, both in reading and writing.

Upon successful completion of this program, students should be able to:

- Apply various automotive theories for, testing, diagnosing malfunctions, evaluating, and repairing automotive systems and components.
- Demonstrate proficiency in the use of basic and specialized tools.
- Interpret electronic and written service manuals, flat rate manuals, and technical service bulletins.
- Demonstrate proficiency in the use of electronic diagnostic equipment.
- Obtain the Pennsylvania Emission and Safety Inspector Certifications.
- Achieve employment as 2nd to 1st class automotive technician.
- Utilize shop tools, personal hand tools, and power tools.
- Identify and explain the starting system, its design, components, control circuits.
- Perform starting system testing.
- Inspect air induction system, exhaust system components, turbochargers and superchargers.
- Diagnose, service and repair anti-lock brake systems and automated traction control.
- Repair frames, suspension system components, McPherson’s Strut Systems, and independent suspension systems.
- Perform front suspension inspection, service, and component repairs.
- Analyze fuel injection system defects
- Determine the extent of repair and/or adjustments for correction of the fuel injection defects.
- Troubleshoot and repair the charging system.
- Diagnose, service, disassemble, measure and repair, the automotive engine.
- Differentiate between manual and automatic transmission/transaxles, power flow and hydraulic applications.

### First Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AUT 100</td>
<td>Introduction to Automotive Service Operation</td>
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<tr>
<td>AUT 101</td>
<td>Automotive Electricity and Electronics</td>
<td>4</td>
</tr>
<tr>
<td>AUT 102</td>
<td>Automotive Engines</td>
<td>4</td>
</tr>
<tr>
<td>ENG 100</td>
<td>English Composition II</td>
<td>3</td>
</tr>
<tr>
<td>DPR 100</td>
<td>Introduction to Computers</td>
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**First Semester Credits:** 16

### Second Semester

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<th>Course Title</th>
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<tbody>
<tr>
<td>AUT 103</td>
<td>Brake Systems</td>
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<tr>
<td>AUT 114</td>
<td>Steering and Suspension Systems</td>
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</tr>
<tr>
<td>AUT 115</td>
<td>Fuel 1 B II</td>
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<td>ENG 112</td>
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<tr>
<td>MATH 105</td>
<td>Business Math</td>
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**Second Semester Credits:** 16

### Third Semester

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<tr>
<td>AUT 151</td>
<td>Ignition Systems</td>
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<tr>
<td>AUT 152</td>
<td>Computer and Emission Diagnosis</td>
<td>3</td>
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<td>AUT 153</td>
<td>Manual Transmission/Transaxle and Clutches</td>
<td>3</td>
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<tr>
<td>COMM 105</td>
<td>Small Group Communication</td>
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</tr>
<tr>
<td>ACC 100</td>
<td>Applied Accounting</td>
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**Third Semester Credits:** 16
### Fourth Semester

<table>
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<tbody>
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<td>AUT 200</td>
<td>Automotive Automatic Transmission/Transaxle</td>
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<td>AUT 121</td>
<td>Engine Performance</td>
<td>3</td>
</tr>
<tr>
<td>AUT 201</td>
<td>Automotive Chassis and Security Systems</td>
<td>2</td>
</tr>
<tr>
<td>AUT 123</td>
<td>Power Train Controls</td>
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<td>POL 130</td>
<td>American State and Local Government</td>
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<tr>
<td>PHY 100</td>
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</table>

**Total Credits Required: 65**

### Business Management, Associate in Applied Science (BUSM)

The Business Management career program is designed to prepare students for supervisory positions in the retail, manufacturing, and service industries. Students planning to transfer immediately after graduation to pursue a bachelor’s degree in management are strongly advised to enroll in the Business Administration program.

Upon successful completion of this program, students should be able to:

- Use legal and ethical standards in dealing with human resources and effective communication.
- Explore career options in the field of business.
- Use computer application software to create business documents, spreadsheets, databases, and presentations.
- Use the Internet to research and to conduct business.
- Interpret financial information used in supervisory positions.
- Employ work methods that foster teamwork within an organization.
- Use established principles of supervision in dealing with supervised employees.
- Use human relations skills to motivate, train, and develop employees.
- Use legal and ethical standards in dealing with human resources and business resources.

### First Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
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<td>3</td>
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<tr>
<td>MATH 105</td>
<td>Business Math</td>
<td>3</td>
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<tr>
<td>BUS 100</td>
<td>Introduction to Business</td>
<td>3</td>
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<tr>
<td>ACC 100</td>
<td>Applied Accounting (or)</td>
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<tr>
<td>ACC 111</td>
<td>Financial Accounting</td>
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<tr>
<td>DPR 100</td>
<td>Introduction to Computers</td>
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**Total Credits:** 15

### Second Semester

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<td>BUS 211</td>
<td>Supervision</td>
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<td>BUS 214</td>
<td>Organizational Behavior</td>
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**Total Credits:** 15

### Third Semester

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<td>Human Resources Management</td>
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**Total Credits:** 15

### Fourth Semester

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<td>BUS 246</td>
<td>Teamwork</td>
<td>3</td>
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<td>BUS 199</td>
<td>Co-op/Internship/Business Elective</td>
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<td>Social Science Elective</td>
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</table>

**Acceptable Electives:**

- ACC 112 Managerial Accounting
- BUS 101 Introduction to International Business
- BUS 102 Introduction to E-Commerce
- BUS 103 Business Processes and Computer Technology
- BUS 110 Sales and Sales Supervision
- BUS 111 International Management
- BUS 149 Small Business Management
- BUS 216 Training & Development
- BUS 217 Compensation & Benefits
- BUS 218 Labor Relations
- BUS 230 Principles of Marketing
- BUS 231 Principles of Advertising
- DPR 111 Advanced Microsoft Office

### Computer-Aided Drafting and Design, Associate in Applied Science (DDT)

Drafting is the common language that scientists, engineers and technicians use to communicate. Accurate and detailed drawings are essential for communication of the concept and application of the designer’s plan, for documenting the production requirements, and for the creation of user’s guides, operation and service manuals.

The associate degree in Computer-Aided Drafting and Design (CADD) program provides the student with appropriate knowledge and skill to perform the professional CADD functions required for entry and professional growth in today’s modern businesses. Major emphasis is placed on presenting an integrated approach to the development of computer-aided drafting and design knowledge, concepts and skills. Instruction in the use of CADD software applications is presented in parallel with graphic theory and related fundamentals of technical design.

Upon successful completion of this program, students should be able to:

- Determine a methodology for approaching and solving a design/drafting problem with the aid of freehand sketching and a CADD system.
- Create two-and three-dimensional technical design models and drawings to determine solutions for defined customer problems.
- Apply the principles of descriptive geometry and graphic construction techniques to document a design intent.
- Utilize plane and solid geometric forms, as well as object viewing techniques including photorealistic rendering and animation, to describe and present a design.
- Develop technical designs for a variety of engineering, manufacturing, construction or facility management applications incorporating the use of working, multiview, assembly and solid model drawings.
- Communicate technical information effectively and efficiently in graphic, oral and written form.

The associate degree in applied science will be awarded after satisfactory completion of this four-semester program.
### Construction Management Technology, Associate in Applied Science (CTEC)

The program in Construction Management is intended to prepare graduates for employment in the construction industry as entry-level assistants to project managers, engineers, field superintendents, estimators, expediters, inspectors, and field engineers. Emphasis is placed on the development of knowledge and skills in modern information systems as they relate to construction planning and process management, while completing a basic survey of the theory and technology of the construction industry. The program has been designed to meet the needs of a variety of students. These students range from skilled trade workers who seek supervisory or management positions to recent high school graduates beginning a career in the field of Construction Management.

Upon successful completion of this program, students should be able to:
- Interpret construction specifications and drawings.
- Research methods and materials for construction projects under the supervision of an engineer or architect.
- Assemble basic information needed to estimate quantities and costs of construction materials and components.
- Evaluate accurate observations of construction projects for conformance with construction documents.
- Communicate effectively as a member of the construction project team.
- Provide to, and obtain from, the project schedule, information relevant to project management.
- Use contemporary information systems in the context of construction management.

### Course Schedule

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td>ENG 100</td>
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<td>*MAT 110</td>
<td>Technical Mathematics I</td>
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<td>TCC 111</td>
<td>Technical Communication</td>
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<td></td>
<td>TCC 112</td>
<td>CADD Graphics</td>
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<td>TME 111</td>
<td>Machining Technology</td>
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<td>*MAT 111</td>
<td>Technical Mathematics II</td>
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<td></td>
<td>PHY 100</td>
<td>Technical Physics I</td>
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<td>TCC 121</td>
<td>Project Management Processes</td>
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<td>TCC 122</td>
<td>2-D CADD</td>
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<td>TDD 128</td>
<td>Detailing, Assembly and Fixture Design</td>
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<td>ENG 112</td>
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<td>PHY 101</td>
<td>Technical Physics II</td>
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<td>TDD 216</td>
<td>Three Dimensional CADD</td>
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<td>TME 216</td>
<td>Statics and Strength of Material</td>
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<td>Advanced CADD</td>
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<td>TCS 100</td>
<td>Construction Blueprint Reading</td>
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<td>TDD 203</td>
<td>Kinematics (or)</td>
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<td>Architectural Graphics I</td>
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<td>TCC 228</td>
<td>Design Project Methods</td>
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<td>TDD 199</td>
<td>Co-op Internship</td>
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<td><strong>Total Credits Required</strong>: 63</td>
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</table>

*MAT 140, MAT 141 or MAT 160, MAT 161 may be elected instead.

### Early Childhood Education, Associate in Applied Science (ECE)

The Early Childhood Education program prepares students to work with young children in a variety of settings that require understanding of how children grow, learn and develop. Such trained personnel are in demand at day care centers, private nursery schools, Head Start centers, Montessori schools, church pre-school programs, public schools, hospitals and therapy centers.
Program emphasis is on working with normal children; however, problems relating to exceptional children, such as gifted, retarded, emotionally disturbed, culturally different and brain injured are considered.

The field experience and practicum (ECE 121, 122) provide opportunities for students to become involved in actual work with children and to share experiences with fellow students. In conjunction with class work, students are provided opportunities to observe children and present activities in the College’s ECE lab.

Graduates will be awarded the associate in applied science degree.

Upon successful completion of this program, students should be able to:

• Depict a responsible and professional attitude toward career goals.
• Demonstrate attitudes implicit in the commonly accepted principles and practices in early childhood education.
• Design a curriculum consistent with a recognized philosophy of early childhood education.
• Employ appropriate child behavior reporting techniques in an early childhood educational setting.
• Select and apply age-appropriate materials, equipment and activities for curricula designed to meet the needs of the normal, the culturally different and atypical children.
• Select and apply age-appropriate materials, equipment and activities for curricula designed to meet the needs of the normal, the culturally different and atypical children.
• Employ appropriate child behavior reporting techniques in an early childhood educational setting.
• Design a curriculum consistent with a recognized philosophy of early childhood education.
• Demonstrate attitudes implicit in the commonly accepted principles and practices in early childhood education.
• Manifest a responsible and professional attitude toward career goals.

See Electives Listing, Page 70.

First Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ENG 100</td>
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Second Semester

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<td>ECE 131</td>
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Third Semester

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<td>**PSY 140</td>
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<td>ECE 200</td>
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<tr>
<td>Science or Mathematics Elective</td>
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</table>

| Total Credits Required: 62-63 |

"SOC 110 may be substituted.

Electronic Commerce, Associate in Applied Science (ECM)

Electronic Commerce is the advertising, selling and buying of products and services—both retail to the consumers, and wholesale, from business to business—through the Internet. The program in Electronic Commerce is intended for small business owners and employees of companies that engage in electronic commerce to develop and deploy e-business solutions. The emphasis in the program is on the development of sound business and computer skills to participate in the growing world of electronic commerce. With this focus, the program teaches individuals how to attract people to the Web site, what to do with customers once they are on a Web site, how to provide customer service through the Internet, and how the Web site fits into a company’s larger goals and marketing scheme.

This program combines traditional liberal arts and business courses with hands-on computer skills. Emphasis in the program is on the management, marketing, advertising and legal implications of operating a business that conducts electronic commerce.

Upon successful completion of this program, students should be able to:

• Discuss electronic commerce concepts and practices.
• Identify terms used in electronic commerce and related technologies.
• Discuss the global impact of electronic commerce on business.
• Develop and maintain a Web page to market a product or service.
• Apply business principles to electronic commerce.
• Use computer software and applications to enhance business operations.
• Develop a supply chain strategy for a business operation.
• Discuss the legal, political and ethical issues associated with an international business that engages in electronic commerce.
• Develop a marketing plan for a business engaged in electronic commerce.

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENG 100</td>
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<td>BUS 100</td>
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<td>MATH 105</td>
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Second Semester

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<td>BUS 102</td>
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Third Semester

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<td>BUS 130</td>
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<td>IMM 120</td>
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<tr>
<td>BUS 243</td>
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<td>BUS 234</td>
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<tr>
<td>ACC 100</td>
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15

Delaware County Community College
Electronics Technology, Associate in Applied Science (ETEC)

The associate degree in Electronics Technology prepares students for employment as electronic technicians who work on a variety of highly specialized electronics equipment and products in locations from the original manufacturer to the final user. This work may include design, construction, testing, installation, maintenance and repair.

Upon successful completion of this program, students should be able to:
- Identify malfunctions in electrical and electro-mechanical instruments.
- Repair non-functioning electrical and electro-mechanical instruments.
- Calibrate scientific and industrial instruments.
- Use established maintenance procedures for scientific and industrial instruments.
- Test input/output parameters of electrical/mechanical devices.
- Assemble electrical and electro-mechanical devices.
- Identify electrical/electro-mechanical components, devices or systems in accordance with predetermined specifications.
- Present technical information in oral, written and graphic form, including use of microcomputers to manipulate content and access information.

The associate degree in applied science will be awarded after satisfactory completion of the four-semester program.

First Semester

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<td>TCC 111</td>
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Second Semester

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<td>PHY 110</td>
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Third Semester

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Fourth Semester

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<td>COMM 100</td>
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<td><strong>Total</strong></td>
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</tbody>
</table>

Total Credits Required: 61

A certificate program is also available. See page 60.

Emergency Management and Planning, Associate in Applied Science

The Emergency Management and Planning associate degree program is designed for individuals who are seeking careers that are related to management of emergency and catastrophic situations that are accidental, provoked or natural disasters. The primary focus of the program is to provide an educational vehicle and skill set for first responder professionals such as Firefighters, Law Enforcement Officers, Medical First Responders and Hazardous Materials Professionals to approach emergency situations in a uniform fashion. The technical core of the program focuses on the knowledge and skills required to effectively manage and mitigate emergency and disaster incidents. Individuals employed in the private sector as safety officers or security professionals can also develop and strengthen their skills and effectiveness by completing this program. The competencies and course content has been developed with significant consideration of the coursework developed by the Federal Emergency Management Agency (FEMA), state emergency management agencies and local emergency planning committees.

Upon successful completion of this program, students should be able to:
- Demonstrate skills as a first responder in fire fighting, law enforcement, medical responders or hazard materials technicians.
- Implement principles and best practices in incident management.
- Develop plans and procedures for dealing with various emergency situations.
- Identify the dangers associated with various emergency situations and apply the proper safety procedures for oneself and the public at large.
- Recognize the role of fellow first responders in emergency situations.
- Explain the psychology of terrorism. Implement appropriate procedures in dealing with terrorism threats, and incidents.
- Perform procedures and protocol for search and rescue operations.
- Communicate procedures effectively to mitigate emergency situations with first responder colleagues.
- Employ critical thinking and problem solving techniques relevant to emergency situations.

Students must complete the courses listed under the concentration selected for the Emergency Management and Planning degree.

Fire Science Concentration (EMF)

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<th>Course</th>
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Municipal Police Officer Concentration (EMP)

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</table>
MPT 206 Report Writing/Case Preparation .................................. 2
MPT 207 Emergency Response Training .................................... 3

Emergency Medical Technician Concentration (EMM)
EMS 100 Emergency Medical Technician .................................. 7
HMT 101 Hazardous Materials Communication .......................... 3
EMS 200 Pre-Hospital Emergency Care .................................... 3
EMS 201 Pre-Hospital Trauma Life Support ............................... 1
EMS 105 Critical Incident Stress Management ............................ 2
EMS 107 Emergency Vehicle Operator Course ......................... 1
_______ Open Elective ............................................................ 3
_______ Open Elective ............................................................ 3

Course Offering by Semester

First Semester
ENG 100 English Composition I .............................................. 3
COMM 100 Introduction to Interpersonal Communication .......... 3
CHE 105 Technical Chemistry ............................................... 3
_______ Concentration Courses ............................................ 3-9

Second Semester
ENG 112 English Composition II ........................................... 3
EMS 204 Incident Management ............................................. 3
EMS 134 Emergency Planning .............................................. 3
_______ Concentration Courses ............................................ 6

Third Semester
EMS 130 Leadership and Influence in Emergency Response .... 3
EMS 132 Search and Rescue ................................................ 3
MATH 105 Business Math .................................................... 3
_______ Social Science Elective ............................................ 3
_______ Concentration Courses ............................................ 3-6

Fourth Semester
EMS 136 Special Considerations .......................................... 3
ADJ 202 Terrorism: History, Threat and Response ................. 3
DPR 100 Introduction to Computers ..................................... 3
_______ Concentration Courses ............................................ 6-9

Total Credits Required: 60-64

Facility Management Technology, Associate in Applied Science (FTEC)

Most large corporate enterprises have individuals within their organizational structure charged with the duties of planning and operating the physical facility that houses the organization and its operations. For many companies, these facilities are the largest part of the corporate assets, and their management has become a critical corporate function. There is a growing recognition of the need for sophisticated skills and knowledge in performing this function. Today, the field of facility management is an emerging profession with strong potential for future growth and development.

The Philadelphia Chapter of the International Facility Management Association has joined with the College to develop the Facility Management Technology program. The goal is to provide educational programs for the continuing education and professionalization of current facility managers, and for the basic preparation of individuals seeking entry to this field.

The program combines studies in technical topics such as building systems, and planning and design documentation, with business and management related course work. There is also an opportunity for specialization or advanced study through the Facility Management career electives, as well as the opportunity for initial career exposure through a CSEL/internship.

Upon successful completion of this program, students should be able to:

• Interpret architectural drawings and specifications.
• Understand and demonstrate knowledge of various materials and systems of building operation and construction.
• Utilize computer systems for communication in technical drafting and documentation, project planning and management.
• Discuss basic principles of law and real estate practice in applications of facility management.
• Communicate with clarity and organization in a facility management environment, both orally and in writing.
• Apply basic knowledge and skills of facility management in the investigation and resolution of facility management problems requiring critical analysis.

First Semester
ENG 100 English Composition I .............................................. 3
MAT 110 Technical Mathematics I ......................................... 4
TCC 111 Technical Communication ...................................... 3
TCC 112 CADD Graphics .................................................. 3
TCS 100 Construction Blueprint Reading ................................ 3

Second Semester
MAT 111 Technical Mathematics II ....................................... 4
PHY 100 Technical Physics I ............................................... 3
TCC 121 Project Management Processes ............................... 3
TCC 122 2-D CADD ......................................................... 3
_______ Social Science Elective ............................................ 3

Third Semester
ENG 112 English Composition II ........................................... 3
PHY 101 Technical Physics II .............................................. 3
TCS 111 Methods/Materials of Construction I ....................... 3
BUS 241 Business Law I (or) ............................................. 3
BUS 243 Legal Environment of Business ............................ 3
_______ Facility Management Elective .................................. 3

Fourth Semester
TCS 112 Methods/Materials of Construction II ....................... 3
ARC 226 Mechanical and Electrical Systems in Buildings .... 3
PLG 220 Real Estate Law .................................................. 3
_______ Humanities Elective .............................................. 3
_______ Facility Management Elective or Co-op/Internship ..... 3

Total Credits Required: 62
MAT 140, MAT 141 or MAT 160, MAT 161 may be elected instead.

Facility Management Electives

Facility Management elective courses are an important part of the program. These courses give the curriculum a flexible component that allows entry-level students to pursue a specific area of specialization and allows practitioners to strengthen areas in their professional experience.

Facility Management majors select FM elective courses from an approved list of recommended courses. The list has been established (and will be reviewed for revision periodically) by the FM faculty in consultation with the IFMA
Education Committee. With permission of an academic advisor and dean, a student may request consideration of alternate courses for the FM elective by submitting a course substitution form.

ARC 199 Co-op/Internship, FM Internship – 224 hours
ARC 121 Architectural Graphics I
ARC 215 Architectural Design Concepts
TCS 132 Estimating II
TCS 221 Construction Surveying & Layout
TCS 223 Construction Management
TDD 216 Three-Dimensional CADD
TDD 227 Advanced CADD
FST 201 Fire Protection in Building Construction
FST 202 Fire Systems in Industry
ACC 111 Financial Accounting
ACC 100 Applied Accounting (or)
ENG 112 English Composition II
See Electives Listing, Page 70.

General Business, Associate in Applied Science (BGEN)

The associate degree program in General Business is intended for the student who wants to explore the many areas of business to determine a future career path. The program provides students with necessary required courses in general education and business, which provide a basic understanding of the world of business. Students can design their own curriculum to meet their long-term career objectives.

Upon successful completion of this program, students should be able to:
• Determine a career path they want to follow in business.
• Record financial transactions, perform calculations, and prepare financial statements.
• Use terminology common to the business world.
• Discuss the factors that influence business in the domestic environment.
• Prepare written correspondence commonly used in business.
• Research, prepare and present oral reports common to business.
• Use software common to business for word processing, spreadsheets, presentations, research, and database management.
• Discuss concepts of management, marketing, human resource management, finance, sales, and international business.

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENG 100 English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 105 Business Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>DPR 100 Introduction to Computers</td>
<td>3</td>
</tr>
<tr>
<td>BUS 100 Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>3</td>
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<td>15</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENG 112 English Composition II</td>
<td>3</td>
</tr>
<tr>
<td>ACC 100 Applied Accounting (or)</td>
<td>3</td>
</tr>
<tr>
<td>ACC 111 Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Social Science/Humanities Elective</td>
<td>3</td>
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<td>15</td>
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</tbody>
</table>

Third Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BUS 130 Business Communications</td>
<td>3</td>
</tr>
<tr>
<td>____ Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>____ ACC/BUS/DPR Elective</td>
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Fourth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BUS 225 Professional Development</td>
<td>3</td>
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<tr>
<td>____ Humanities Elective</td>
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<tr>
<td>____ ACC/BUS/DPR Elective</td>
<td>9</td>
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<td>15</td>
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</tbody>
</table>

Recommended ACC/BUS/DPR Electives:

ACC 112 Managerial Accounting | 3
ACC 115 Computerized Accounting | 3
ACC 201 Introduction to Cost Accounting | 3
ACC 202 Introduction to Tax Accounting | 3
BUS 101 Introduction to International Business | 3
BUS 102 Introduction to Electronic Commerce | 3
BUS 110 Sales and Sales Supervision | 3
BUS 149 Small Business Management | 3
BUS 210 Principles of Management | 3
BUS 215 Human Resource Management | 3
BUS 230 Principles of Marketing | 3
BUS 231 Principles of Advertising | 3
BUS 232 Principles of Finance | 3
BUS 233 Financial Planning | 3
BUS 243 Legal Environment of Business | 3
DPR 105 Management Information Systems | 3
DPR 108 Introduction to Computer Science | 3
DPR 111 Advanced Microsoft Office | 4

Total Credits Required: 60

Other ACC/BUS/DPR courses may be taken with the approval of the Dean, Business/Computer Information Systems.

*A higher-level mathematics course may be substituted.

General Studies, Associate in Applied Science (GEN)

The General Studies program is designed for those students who wish to broaden their cultural backgrounds, improve their effectiveness as citizens and parents, and increase their knowledge and understanding of the world in which they live.

Through the General Studies program, students are exposed to meaningful experiences that will assist them in developing special interests. When the students’ interests become focused on a specific goal, they can make a smooth transition to a specific program.

Students who successfully complete 60 hours of recommended courses will receive the associate in applied science degree.

See Electives Listing, Page 70.

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 100 English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>____ Mathematics or Science Elective</td>
<td>3-4</td>
</tr>
<tr>
<td>____ Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>____ Open Elective</td>
<td>6</td>
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<td></td>
<td>15-16</td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 112 English Composition II</td>
<td>3</td>
</tr>
<tr>
<td>____ Co-op Internship or Open Elective</td>
<td>6</td>
</tr>
<tr>
<td>____ Mathematics or Science Elective</td>
<td>3-4</td>
</tr>
<tr>
<td>____ History or Political Science Elective</td>
<td>3</td>
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<td></td>
<td>15-16</td>
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</tbody>
</table>
Third and Fourth Semesters:
Courses will be selected with the aid of the faculty advisor to assure a well-rounded program. It is recommended that 18 of the 60 credits required for the degree be taken in a single field of concentration. Students in this program may elect to take three or six credits through the Co-op/Internship Program (CSEL). They will be advised by the program director through their advisor regarding the semesters during which these credits may best be scheduled.

Total Credits Required: 60

Graphic Design, Associate in Applied Science (CART)

Graphic design is the aesthetic arrangement of type and image in order to inform, educate, persuade or sell. Graphic designers plan and produce visual solutions to client problems within the constraints of time, budget and technology. These solutions usually include printed or digital materials such as books, magazines, newspapers, brochures, letterheads, logo systems, posters, presentations and Web pages. The associate degree program in graphic design prepares students for positions in this field, such as entry-level designer, freelance designer, and print production artist.

Although the program is not designed for transfer, students who intend to continue their education may transfer to four-year studio art or design programs. Additional courses may be required to enter transfer institutions at the sophomore or junior level.

Any remediation in reading, English or mathematics must be completed before beginning third semester courses. First-year requirements must be satisfied before beginning second-year course work.

Upon successful completion of this program, students should be able to:
• Use the basic tools and techniques of the graphic designer.
• Communicate in an effective and professional manner both verbally and in writing.
• Compute mathematically on a level that will allow for the solution of common design problems.
• Demonstrate the ability to meet deadlines and incorporate critique recommendations in the work.
• Use computer technology in the execution of design projects.
• Produce a portfolio demonstrating the ability to solve design problems.
• Students will be required to successfully complete two portfolio reviews, one at the end of their first year of study and the second review prior to graduating from the program.
• Upon completion of this program, the student will be awarded the associate in applied science degree. The faculty advisor may approve the College-Sponsored Experiential Learning (CSEL) as additional credits beyond the 66 curriculum credit requirement. Students entering this program should expect an initial expense of approximately $250 for basic art and supplies.

• Most second-year courses require additional consumable art supplies on a per project basis.

First Semester Credits
GRA 133 Drawing I for Graphic Design Majors .................. 3
GRA 122 Two-Dimensional Design .......................... 3
ENG 100 English Composition I ...................... 3
ART 110 Art History I (or) .......................... 3
ART 111 Art History II (or) ...................... 3
GRA 110 History of Graphic Design .................. 3
ART 112 Social Science Elective .......................... 3

Second Semester Credits
GRA 134 Drawing II for Graphic Design Majors (or) 3
GRA 136 Drawing as Design Process .................. 3
GRA 123 Color and Design .................. 3
GRA 121 Three-Dimensional Design 3

Health Care Management, Associate in Applied Science (AHM)

The Health Care Management curriculum prepares students for management roles in a health care environment that is rapidly changing from one focused on episodes of treatment for acute disease to lifelong health maintenance and wellness promotion. The program is intended for health care workers who need new knowledge and skills to compete in the changing health care marketplace. It will also be useful for those individuals with no previous health care experience who seek non-clinical entry-level positions in health care, or who plan to continue their education in the field of health care administration.

Upon successful completion of this program, students should be able to:
• Describe principles, terminology, structure and products of health care management.
• Describe emerging health care delivery systems and their impact on delivery, financing, practice patterns and the utilization of personnel and services.
• Explain the priorities of managing risk, quality improvement and measuring outcomes.
• Assess issues and trends in health care management.
• Develop skills for coordination of care and services in managed care settings.
• Analyze the health care delivery system as a multidisciplinary, multifaceted entity with a variety of entry and access points along a continuum of care.
• Function within an ethical and legal framework appropriate for a managed care environment.
• Develop personal qualities needed to function effectively with individuals and organizations.
• Demonstrate proficiency in computer applications used in a health care environment.
• Apply economic and business practices to the health care setting.

An associate degree in applied science will be awarded upon completion of the required program with a 2.0 GPA and a “C” or better in all Allied Health courses.

First Semester Credits
ENG 100 English Composition I .......................... 3
*MATH 105 Business Math .......................... 3
SOC 110 Introduction to Sociology .................. 3
DPR 100 Introduction to Computers .................. 3

Total Credits Required: 66

CAREER PROGRAMS, ASSOCIATE DEGREE 41
**Second Semester**

- **AHM 233** Medical Terminology ........................................... 3
- **AHM 140** Professional and Communication Issues in Health Care .......... 3
- **COM 100** Introduction to Interpersonal Communication (or) 
- **BUS 130** Business Communications ........................................ 3
- **BUS 100** Introduction to Business ............................................ 3
- **ENG 112** English Composition II ............................................ 3

**Total Credits Required: 15**

**Third Semester**

- **BUS 211** Supervision ......................................................... 3
- **BUS 230** Principles of Marketing ........................................... 3
- **AHM 130** Medical Coding Concepts for Allied Health .................... 3
- **AHA 207** Ethical/Legal Aspects of Health Care Management ............. 3
- **AH/BUS Elective** ............................................................... 3

**Total Credits Required: 15**

**Fourth Semester**

- **AHA 209** Philosophy of Managed Care ...................................... 3
- **AHA 210** Outcomes Measurement and Management ......................... 3
- **AHA 206** Reimbursement and Financing Methods ............................ 3
- **AHA 217** Quality Improvement and Accreditation Process ............... 3
- **AHA 213** Managing Utilization and Risk ..................................... 3

**Total Credits Required: 15**

**Advanced-Standing Core**

Nine to fifteen credits for the Allied Health core maybe awarded for previous
education, training and work experience in an allied health field through credit
for prior learning. Examples might include, but are not limited to: medical
assistant, physician assistant, medical technology, nursing, respiratory therapy,
medical secretary, health unit coordination, surgical technology, dietitian,
radiation technology, etc.

Students may be asked to take one or two courses within this core based on
portfolio assessment.

Students with previous health care experience are may NOT be required to
take some or all of the following courses:

- **AHM 233** Medical Terminology
- **AHM 100** Orientation to Health Care
- **AHA 207** Ethical/Legal Aspects of Health Care Management
- **AHM 140** Professional and Communication Issues in Health Care

**Health Studies, Associate in Applied Science General Options (HSTU)**

The Associate of Applied Science in Health Studies is designed to offer
students interested in working within the health care field an opportunity to
attain the associate degree. Students acquiring this degree would be able to
pursue advancement opportunities within varied health care settings. This
program is especially advantageous for students who have completed
certificates of competency and proficiency programs offered by the Allied
Health and Nursing department and wish to complete a degree course of
study. The program offers a broad view of health care related topics while
providing a basic liberal studies foundation.

Employment settings are varied and include hospitals and health networks,
health and wellness organizations, physician’s offices, insurance companies,
nursing and residential care facilities and educational institutions. Examples of
positions that would be applicable include: Billing Supervisor, Patient Service
Representative, Medical Administrative Assistant, Medical Supply Manager,
and Allied Health Instructor.

An Associate of Applied Science will be awarded upon completion of the
Health Studies curriculum with a 2.0 GPA and a “C” or better in all Allied
Health (AH) courses.

Upon successful completion of this program, students should be able to:
- Describe the terminology and bio-psycho-social foundations related to the
function of the human body.
- Discuss the bio-psycho-social and economic principles that guide and govern
health care delivery systems.
- Demonstrate the analytic and reasoning qualities necessary to function
effectively in health care settings.
- Utilize skills and knowledge related to proficiency in health care computer
applications.
- Analyze the ethical and legal issues related to health care.
- Explain aspects of factors related to current trends in health care
management and delivery.
- Advance personal career paths and interests related to employment in health care.
- Communicate effectively and appropriately in oral and written exchanges.

**First Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENG 100</td>
<td>English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>DPR 100</td>
<td>Introduction to Computers</td>
<td>3</td>
</tr>
<tr>
<td>AHM 100</td>
<td>Orientation to Health Care</td>
<td>3</td>
</tr>
<tr>
<td>AHM 233</td>
<td>Medical Terminology</td>
<td>3</td>
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<tr>
<td>*BIO 100</td>
<td>Biological Science</td>
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</table>

**Second Semester**

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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENG 112</td>
<td>English Composition II</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110</td>
<td>Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>AHM 140</td>
<td>Professional and Communication Issues in Health Care</td>
<td>3</td>
</tr>
<tr>
<td>* Humanities Elective</td>
<td>3</td>
<td></td>
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<tr>
<td>** Open Elective</td>
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</table>

**Third Semester**

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<thead>
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<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AHM 104</td>
<td>Body Structure/Function I (or)</td>
<td>3</td>
</tr>
<tr>
<td>BIO 117</td>
<td>Human Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>AHA 207</td>
<td>Ethical/Legal Aspects of Health Care Management</td>
<td>3</td>
</tr>
<tr>
<td>MAT 120</td>
<td>Modern College Math</td>
<td>3</td>
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<td>** Allied Health Elective</td>
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<tr>
<td>*** Social Science Elective</td>
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**Fourth Semester**

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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AHM 105</td>
<td>Body Structure/Function II (or)</td>
<td>3</td>
</tr>
<tr>
<td>BIO 118</td>
<td>Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>PSY 140</td>
<td>General Psychology</td>
<td>3</td>
</tr>
<tr>
<td>AHA 209</td>
<td>Philosophy of Managed Care</td>
<td>3</td>
</tr>
<tr>
<td>BIO 220</td>
<td>Nutrition and Well-Being</td>
<td>3</td>
</tr>
<tr>
<td>Open Elective or Co-op/Internship</td>
<td>3</td>
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</tr>
</tbody>
</table>

**Total Credits Required: 60 – 62**

*Humanities electives include: Any courses listed as ART, DRA, ENG 113 or above, FRE, HUM, ITA, MUS, PHI, SPA, SPE

*AH elective include: Courses listed as AHM, AHN, AHS, AHU, RTH (must be a
skills course related to clinical or administrative responsibilities)

**Social Science electives: Any course listed as HIS, POL, ECO, PSY (above
140) or SOC (above 110)

For students holding external certificates who wish to transfer credits to this
program Natural Science electives will satisfy these credit requirements.
### Pre-Nursing Option (HSTN)

*(All students interested in nursing at DCCC should follow this course schedule)*

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENG 100 English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>BIO 117 Human Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>PSY 140 General Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110 Introduction to Sociology</td>
<td>3</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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</thead>
<tbody>
<tr>
<td>ENG 112 English Composition II</td>
<td>3</td>
</tr>
<tr>
<td>BIO 118 Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>PSY 220 Abnormal Psychology</td>
<td>3</td>
</tr>
<tr>
<td>PSY 210 Lifespan Human Development</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

**Nursing Students**

Students accepted into DCCC’s Nursing program who have completed all of the above courses will need to complete 41 additional credits in nursing coursework (below) to complete the Associate of Applied Science in Nursing.

**Fall Semester**

| NUS 110 Fundamentals of Nursing | 8 |

**Spring Semester**

| NUS 111 Nursing Concepts and Practices I | 10 |

**Fall Semester**

| NUS 210 Nursing Concepts and Practices II | 10 |

**Spring Semester**

| NUS 211 Nursing Concepts and Practices III | 10 |
| Nursing Elective | 3 |

**Health Studies Students (2nd year)**

**Fall Semester**

| DPR 100 Introduction to Computers | 3 |
| AHM 100 Orientation to Health Care | 3 |
| AHM 233 Medical Terminology | 3 |
| BIO 100 Biological Science | 4 |
| *Social Science or Humanities Elective | 3 |
| **Total** | **16** |

**Second Semester**

| HVA 100 Introduction to Heating, Ventilating, Air Conditioning and Refrigeration | 2 |
| HVA 200 Advanced HVAC Electrical Fabrication | 2 |
| HVA 103 Advanced Refrigeration and Air Conditioning | 2 |
| HVA 107 Gas Heating | 3 |
| HVA 108 Duct and Sheet Metal Fabrication and Installation-Residential | 3 |
| MAT 110 Technical Mathematics I | 4 |
| TCC 111 Technical Communication | 3 |
| **Total** | **17** |

**Third Semester**

| HVA 203 Heat Pump Systems | 2 |
| HVA 112 Oil Burner and Hydronic Steam Heating | 2 |
| HVA 111 Advanced Duct and Sheet Metal Fabrication/Installation-Commercial | 3 |
| HVA 110 Hydronic Heating Systems | 2 |
| MAT 111 Technical Mathematics II | 4 |
| *Humanities Elective | 3 |
| **Total** | **16** |

*Health Studies students must take one social science elective and one humanities elective.*

**Students not accepted into DCCC nursing program who decide to transfer to a BSN program may change major to HSCI for 2nd year.**

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### Heating, Ventilation, Air Conditioning and Refrigeration, Associate in Applied Science (HVAC)

The associate degree in Heating, Ventilation, Air Conditioning and Refrigeration prepares students for employment as HVAC&R technicians who work on a variety of equipment and products. This work may include installation, maintenance and repair of various types of climate control units. The Delaware Valley chapter of The Air Conditioning Contractors of America (ACCA) has joined with the College to develop this program. The goal is to provide an educational program for current technicians, and for the basic preparation of individuals seeking entry to this field.

Upon successful completion of this program, students should be able to:

- Identify and explain the functions of components in residential and light commercial HVAC&R equipment.
- Describe the cycle of operation of residential and light commercial HVAC&R equipment.
- Interpret wiring diagrams and building blueprints.
- Perform specific installation and start-up procedures to insure operational efficiency and safety of HVAC&R equipment.
- Diagnose trouble in operating safety controls.
- Cite the procedures of heat loss and heat gain load calculations.
- Identify how to handle refrigerant and detail potential environment hazards of fluorocarbons.
- Detail the techniques of servicing equipment and start-up to develop service ability with hands-on experience.
- Detail duct fabrication and installation in residential and light commercial buildings.
- Describe the operation of hydronic and oil burner systems.
- Diagnose trouble in hydronic and oil burner systems.
- Cite procedures for servicing gas and oil heating systems.

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HVA 100 Introduction to Heating, Ventilating, Air Conditioning and Refrigeration Electrical Fabrication</td>
<td>2</td>
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<tr>
<td>HVA 101 Introduction to Refrigeration and Air Conditioning</td>
<td>2</td>
</tr>
<tr>
<td>HVA 104 Practical Math for HVAC</td>
<td>3</td>
</tr>
<tr>
<td>HVA 106 Basic Piping for Contractors</td>
<td>2</td>
</tr>
<tr>
<td>HVA 201 Refrigerant Certification</td>
<td>2</td>
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<tr>
<td>HVA 202 Oil/Gas Burner Service</td>
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</tr>
<tr>
<td>ENG 100 English Composition I</td>
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<tr>
<td><strong>Total</strong></td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>HVA 103 Advanced Refrigeration and Air Conditioning</td>
<td>2</td>
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<tr>
<td>HVA 200 Advanced HVAC Electrical Fabrication</td>
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</tr>
<tr>
<td>HVA 107 Gas Heating</td>
<td>3</td>
</tr>
<tr>
<td>HVA 108 Duct and Sheet Metal Fabrication and Installation-Residential</td>
<td>3</td>
</tr>
<tr>
<td>MAT 110 Technical Mathematics I</td>
<td>4</td>
</tr>
<tr>
<td>TCC 111 Technical Communication</td>
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<td><strong>Total</strong></td>
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<table>
<thead>
<tr>
<th>Third Semester</th>
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<tbody>
<tr>
<td>HVA 203 Heat Pump Systems</td>
<td>2</td>
</tr>
<tr>
<td>HVA 112 Oil Burner and Hydronic Steam Heating</td>
<td>2</td>
</tr>
<tr>
<td>HVA 111 Advanced Duct and Sheet Metal Fabrication/Installation-Commercial</td>
<td>3</td>
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<tr>
<td>HVA 110 Hydronic Heating Systems</td>
<td>2</td>
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<tr>
<td>MAT 111 Technical Mathematics II</td>
<td>4</td>
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<tr>
<td>*Humanities Elective</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>
Fourth Semester

HVA 109 HVAC Troubleshooting .................................................. 3
HVA 204 Blueprint Reading for HVAC Technicians ............................ 2
HVA 113 Hydronic Troubleshooting ............................................. 3
MTT 129 Solids (CAM) Modeling ............................................... 3
** Natural Science Elective .......................................................... 4
*** Social Science Elective ....................................................... 3

Total Credits Required: 67

* Humanities Electives: HUM 105, HUM 110, HUM 120, HUM 160, or
  HUM 170
** Natural Science Electives: PHS 120 to 140
*** Social Science Electives: SOC 100 to 200, HIS 120, or ECO 220

Hotel and Restaurant Management, Associate in Applied Science (HRM)

The Hotel/Restaurant Management program is designed for individuals seeking specialized training as preparation for a career in the vast hospitality industry. Hotel and Restaurant Management graduates can enter the industry at a supervisory level and perform certain management functions and duties. Upon successful completion of this program, students should be able to:

• Choose from a wide variety of career options in the hotel/restaurant management field.
• Use terminology specific to the hotel/restaurant/food service industry.
• Supervise the operations of a front desk in a hotel or motel.
• Apply federal, state, and local laws and regulations that are specific to the hotel and restaurant industry.
• Be certified in food handling sanitation.
• Prepare a wide variety of foods typically served in a hotel, restaurant, or food service establishment.
• Plan, prepare, serve and cost a meal for a group.
• Use accepted accounting practices to record transactions.
• Use financial information to control internal costs and maximize operational effectiveness.
• Communicate effectively with employers, employees, and customers in writing and speech.
• Use computer application software to prepare reports, spreadsheets, and presentations.
• Apply human resource management principles in dealing with employees.

First Semester Credits

ENG 100 English Composition I .................................................. 3
MATH 105* Business Math ....................................................... 3
DPR 100 Introduction to Computers .......................................... 3
HRM 100 Introduction to Hospitality ....................................... 3
HRM 110 Food Handler Sanitation ........................................... 1
SOC 110 Introduction to Sociology (or) .................................... 3
PSY 140 General Psychology ................................................... 3

Second Semester

ENG 112 English Composition II ............................................... 3
ACC 100 Applied Accounting (or) ............................................ 3
ACC 111 Financial Accounting ............................................... 3
HRM 150 Professional Cooking I ............................................. 3
HRM 155 Front Office Management ......................................... 3
HRM 162 Laws of Innkeepers .................................................. 3

15

Third Semester

BUS 130 Business Communications .......................................... 3
BUS 110 Sales and Sales Supervision (or) .................................. 3
BUS 230 Principles of Marketing ............................................. 3
HRM 151 Professional Cooking II ........................................... 3
HRM 253 Food Service Management ........................................ 3
HRM 254 Quantity Food and Catering .................................... 3
HRM 199 Co-op Internship or HRM Elective ........................... 6

15

Fourth Semester

BUS 215 Human Resource Management .................................... 3
HRM 254 Quantity Food and Catering .................................... 3
HRM 199 Co-op Internship or HRM Elective ........................... 6

15

Total Credits Required: 61

* Finite Mathematics (MAT 130) may be substituted.

Industrial Systems Technology (ISTD)

The associate degree in Industrial Systems Technology prepares students for employment as Industrial Systems and Maintenance Technicians with responsibility for installing, maintaining, troubleshooting, repairing and/or replacing a variety of equipment in a manufacturing environment. Specific topic of coverage will include fluid power and controls, gear and belt-drive systems, conveyors, electric motors and control systems, programmable logic controls and process control. Industrial Systems Technicians work directly with engineers, designers and plant management as well as specialized equipment installers. Upon successful completion of this program, students should be able to:

• Demonstrate knowledge associated with mechanical systems, to include: conveyors, belt and gear drives and associated mechanisms.
• Repair, replace or install various types of industrial piping.
• Make effective use of manual and powered hand tools.
• Communicate technical information effectively in written and oral manners.
• Prepare and implement a plan for preventive maintenance of equipment.
• Analyze and troubleshoot industrial electrical circuits, including control circuits.
• Use various electrical test and measurement devices.
• Interpret and follow appropriate OSHA Standards, as well as apply appropriate health, safety and accident practices and procedures.
• Read and interpret industrial system drawings and schematics.
• Describe the operation of a fluid power unit and explain flow, pressure, temperature and related measurements.
• Perform measurements, calculations and calibrations necessary for the proper installation and alignment of equipment.
• Interpret and troubleshoot programmable logic control systems.

First Semester Credits

ENG 100 English Composition I .................................................. 3
TME 115 Basic Technical Skills ................................................. 3
TCC 111 Technical Communication ......................................... 3
MAT 110 Technical Mathematics I .......................................... 4
IST 100 Introduction to Industrial System Technologies .............. 3

16

Second Semester

IST 101 Industrial Drive Systems ............................................. 3
TEL 101 DC Analysis ............................................................... 4
HVA 106 Basic Piping for Contractors .................................... 2
PCT 100* Plant Equipment ....................................................... 3
IST 105 Industrial Systems Driving Interpretation ..................... 3

15


**Third Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COM 100</td>
<td>Introduction to Interpersonal Communication</td>
<td>3</td>
</tr>
<tr>
<td>ELT 203</td>
<td>Industrial Electrical Systems</td>
<td>4</td>
</tr>
<tr>
<td>ENG 112</td>
<td>English Composition II</td>
<td>3</td>
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<tr>
<td>PHY 100</td>
<td>Technical Physics I</td>
<td>3</td>
</tr>
<tr>
<td>ELT 204</td>
<td>Introduction to Programmable Logic Controllers</td>
<td>3</td>
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</table>

**Fourth Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HVA 206</td>
<td>Industrial Piping</td>
<td>3</td>
</tr>
<tr>
<td>TME 229</td>
<td>Fluid Power and Controls</td>
<td>4</td>
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<tr>
<td>MAT 111</td>
<td>Technical Mathematics II</td>
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<tr>
<td><strong>IST Elective</strong></td>
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</tr>
<tr>
<td><strong>Social Science Elective</strong></td>
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**Total Credits Required: 63**

<table>
<thead>
<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>TEL 200</td>
<td>Electro/Mechanical Systems</td>
<td>3</td>
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<tr>
<td>IST 200</td>
<td>Pumping Systems</td>
<td>3</td>
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<tr>
<td>HVA 100</td>
<td>Introduction to Heating, Ventilating, Air Conditioning and Refrigeration and Electrical Fabrication</td>
<td>2</td>
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<tr>
<td>WLD 100</td>
<td>Introduction to Welding Processes</td>
<td>2</td>
</tr>
<tr>
<td>TEL 102</td>
<td>AC Analysis</td>
<td>4</td>
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<tr>
<td>TCS 108</td>
<td>Construction Supervision</td>
<td>3</td>
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<tr>
<td>TCS 109</td>
<td>Construction Project Administration</td>
<td>3</td>
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<tr>
<td>TCC 121</td>
<td>Project Management Processes</td>
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**Information Technology Core: 12 credits**

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<tbody>
<tr>
<td>MAT 120-121</td>
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<tr>
<td>MAT 130-131</td>
<td>or</td>
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<tr>
<td>MAT 140-141</td>
<td>or</td>
<td>6-10</td>
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<tr>
<td>MAT 150</td>
<td>or</td>
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<tr>
<td>MAT 160-161</td>
<td>or</td>
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</table>

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<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>Social Science Elective</strong></td>
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<tr>
<td><strong>Humanities Elective</strong></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Science Elective</strong></td>
<td></td>
<td>3-4</td>
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</tbody>
</table>

**Computer Programming Option (DPRP): 32-33 Credits**

This concentration is intended to prepare students for a career or further study in computer programming. A computer programmer works with a computer analyst and computer engineer to analyze, design, develop, test, implement and maintain computer applications to meet the functional objectives of a business. It is the job of the computer programmer to design and update the software that runs on the computer. A programmer usually works with an analyst to help determine the best way to approach a problem or implement a desired feature for a new version of a software package. A programmer codes the changes and then tests and debugs the software.

The Computer Programming curriculum is designed to prepare students for employment as computer programmers. This option emphasizes the more popular computer languages used in businesses today.

In conjunction with the general education and IT core requirements students should be able to:

- Analyze problems with respect to the requirements of the computer and the required results
- Plan detailed program logic to solve problems and convert the logic to a well-structured applications program using a problem-oriented language and providing program documentation
- Demonstrate the ability to use debugging techniques, the computer system library, software aides and utilities in the development and application of a computer program.
- Demonstrate an understanding of the structure of mathematics and its relation to computers
- Demonstrate the ability to communicate effectively using appropriate computer technology with programmers, analysts and management

**Programming Core: 32-33 Credits**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>DPR 108</td>
<td>Introduction to Computer Science</td>
<td>3</td>
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<tr>
<td>DPR 205</td>
<td>Introduction to Java Programming</td>
<td>4</td>
</tr>
<tr>
<td>DPR 207</td>
<td>Introduction to Oracle: SQL</td>
<td>3</td>
</tr>
<tr>
<td>DPR 209</td>
<td>Programming in PERL</td>
<td>4</td>
</tr>
<tr>
<td>DPR 212</td>
<td>Data Structures &amp; Algorithms</td>
<td>4</td>
</tr>
<tr>
<td>DPR 222</td>
<td>Visual Basic Programming</td>
<td>4</td>
</tr>
<tr>
<td>DPR 226</td>
<td>Object Oriented C++</td>
<td>4</td>
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<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>DPR Elective</td>
<td>(Choose two):</td>
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<tr>
<td>DPR 113</td>
<td>Database Management Systems</td>
<td>4</td>
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<tr>
<td>DPR 141</td>
<td>UNIX Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>DPR 206</td>
<td>Programming for the Web</td>
<td>3</td>
</tr>
<tr>
<td><strong>199</strong></td>
<td>Co-op/Internship or IMM/DPR/NET Electives</td>
<td>3</td>
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</table>

**Total Credits Required: 65-71**
Computer Applications Option (ITCA): 28-30 Credits

This concentration is intended to prepare students for a career or further study in the computer applications field. The courses represent specific skills necessary to train students in the design, development, marketing, and testing of computer games. Students contemplating a career in video game development should elect this concentration.

In conjunction with the general education and IT core requirements students should be able to:

- Develop a game concept and create a game design document
- Develop a prototype from their game design using a game development tool
- Program a game in an object oriented programming language
- Test the usability of a computer game
- Develop a game portfolio and a game marketing plan

Game Development Core: 29 credits

DPR 108 Introduction to Computer Science ........................................ 3
DPR 232 Introduction to Computer Game Design and Development .... 3
DPR 226 Object Oriented C++ (or) ................................................... 3
DPR 205 Introduction to JAVA Programming ..................................... 4
DPR 234 Introduction to Computer Game Programming .................... 4
DPR 236 Game Art & Animation (or) ............................................... 3
GRA 207 Electronic Illustration I ....................................................... 3
IMM 110 Multimedia Graphics and Design ..................................... 3
IMM 201 Audio and Video for Multimedia .................................. 3
DPR 238 Game Design Theory and Practice ................................... 3
DPR 250 Game Portfolio .............................................................. 3

Total Credits Required: 62-67

Network Engineering Option (DPRN): 34 credits

The Network Engineering option prepares students for employment as networking specialists in the telecommunications industry. The program includes the knowledge and skills necessary to successfully complete many of the tests required for Novell’s Certified Network Administrator certification and Microsoft’s Certified Professional certification. Students may also take courses to prepare for Novell’s CNE or Microsoft’s MCSE certification. Because of the constantly changing nature of the technology in this program, students are advised to meet on a consistent basis with their faculty advisor.

In conjunction with the general education and IT core requirements students should be able to:

- Install and configure NetWare network operating system.
- Install and configure Microsoft operating system.
- Administer, manage, and troubleshoot NetWare operating system.
- Administer, manage, and troubleshoot an operating system.
- Analyze, test, and propose solutions for problems relating to network cabling, hubs, servers, workstations, and other physical network devices.
- Analyze, test, and propose solutions relating to network printing.
- Analyze, test, and propose solutions for problems relating to network protocols, including the Internet (TCP/IP) protocol suite.

Networking Core: 34 Credits

NET 115 Windows 2000 Professional ............................................... 4
NET 116 Microsoft Windows Server 2003 ...................................... 3
NET 117 Win 2000 Directory Services Implementation & Administration 4
NET 210 CISCO Network Support .................................................. 6
NET 230 Novell Network Administration (6.x) ................................. 4
NET 231 Advanced Novell Network Administration (6.x) ................. 4
NET 232 Network Design and Implementation (6.x) ....................... 4
NET 241 Network Protocols TCP/IP .............................................. 4

Total Credits Required: 67-72

Web Development Option (ITWD): 30 Credits

The Web Development option is designed for students interested in pursuing a career as a Web professional. Completion of this program option will provide students with the skills needed for entry-level positions as Web page designers/developers. Concepts covered include information design, navigation, and interface design. Students also learn to create Web sites using HTML, XHTML, CSS, JavaScript and PERL/CGI, and how to incorporate new media technologies such as sound, video, and animation into Web sites and use state-of-the-art development tools such as Dreamweaver, Flash, Director, Sound Forge XP, Photoshop, and Media Studio Pro.

In conjunction with the general education and IT core requirements students should be able to:

- Plan for a professional Web site including graphics design, structural analysis, and data gathering.
- Apply user interface design principles to create successful document organization.
- Create Web documents using current HTML/XHTML standards.
- Create Web pages using advanced formatting techniques, tables, frames, forms, Cascading Style Sheets, and Web publishing applications.
- Upload files to a Web server and update and maintain Web sites. Incorporate scripting languages into Web documents to add control and interactive elements.

Web Development Core: 30 Credits

IMM 100 Interface Design Using Director ....................................... 3
IMM 205 Flash ............................................................................. 3
DPR 108 Introduction to Computer Science .................................... 3
DPR 206 Programming for the Web .............................................. 3

Total Credits Required: 62-67
Professional (MCP), Novell Certified Netware Administrator (CNA), and Cisco Microsoft Office Specialist (MOS), Service Technician (A+), Microsoft Certified prepare students to qualify to take certification examinations including, Net +, levels. The learning sequence established by this curriculum is designed to program reflects the growing emphasis on assessment of skills and skill help desk or as a technical support person in a computer environment. The Help Desk/Technical Support (DPM): 31-33 credits

DPR 207 Introduction to Oracle: SQL .................................. 4
DPR 141 UNIX Operating Systems .................................. 3
DPR 209 PERL/CGI Programming ................................. 3
NET 115 Windows 2000 Professional (or) ......................... 3
NET 230 Novell Network Administration (6.x) ..................... 4

DPR electives (select ONLY one of the following):
DPR 205 Introduction to JAVA Programming ..................... 4
DPR 222 Visual Basic Programming ................................. 4
DPR 226 Object Oriented C++ ...................................... 4

Total Credits Required: 63-68

Interactive Multimedia Option (IMM): 28 Credits

This program option provides the student knowledge and skills to develop World Wide Web (WWW) pages and Computer-Based Training (CBT) applications that employ a variety of audio and visual media including animation, video and graphics.

In conjunction with the general education and IT core requirements students should be able to:
• Identify elements of effective multimedia, CBT and/or web applications.
• Utilize the instructional design process for CBT, multimedia and/or web applications, including needs and assessment, audience analysis, media selection, storyboarding, materials development and program evaluation.
• Determine the appropriate platform (or combination of platforms) for specific audience/environment (text, audio, video) and desired results for CBT, multimedia, and/or web applications.
• Use appropriate authoring tools and programming languages required for production of CBT, multimedia and web applications.
• Use high-level programming languages required for multimedia, CBT or web application development. Identify and incorporate the effective elements of interface design into a CBT or web application.
• Design and create multimedia, CBT or web projects that illustrate appropriate use of text, color, sound, video and user interactivity.
• Demonstrate ability to work in teams to create multimedia, CBT and/or web applications.

Interactive Multimedia Core: 28 Credits
IMM 100 Interface Design Using Director ............................ 3
IMM 110 Multimedia Graphics & Design ........................... 3
IMM 201 Audio & Video for Multimedia ............................. 3
IMM 202 Authorware .................................................... 3
IMM 205 Flash ............................................................. 3
IMM 250 Portfolio Development ....................................... 3
DPR 108 Introduction to Computer Science ......................... 3
DPR 205 Introduction to JAVA Programming (or) ............... 4
DPR 226 Objected Oriented C++ .................................... 4
DPR 206 Programming for the Web .................................. 3

Total Credits Required: 61-66

Help Desk/Technical Support (DPM): 31-33 credits

This option provides students with the necessary skills for employment at a help desk or as a technical support person in a computer environment. The program reflects the growing emphasis on assessment of skills and skill levels. The learning sequence established by this curriculum is designed to prepare students to qualify to take certification examinations including, Net +, Microsoft Office Specialist (MOS), Service Technician (A+), Microsoft Certified Professional (MCP), Novell Certified Netware Administrator (CNA), and Cisco (CCNA).

In conjunction with the general education and IT core requirements students should be able to:
• Demonstrate proficiency in the use of application software.
• Demonstrate proficiency in the use of integrated office software.
• Communicate effectively using appropriate computer terminology.
• Demonstrate the skills necessary to support customers and troubleshoot microcomputers.
• Install and troubleshoot microcomputers in a networked environment.
• Maintain the hardware and software in a networked environment.
• Discuss the hardware and software needs found in a modern business environment.

Help Desk Core: 31-33 Credits
DPR 107 Help Desk Concepts ........................................... 3
DPR 111 Advanced Microsoft Office ................................. 4
DPR 113 Database Management Systems ......................... 4
DPR 227 Introduction to PC Support ............................... 3
DPR 228 PC Repair and Maintenance ............................... 3
NET 116 Microsoft Windows Server 2003 ......................... 4
NET 230 Novell Network Administration (6.x) ..................... 4
Choose two electives from IMM/NET/DPR 6-8

Total Credits Required: 64-71

Machine Tool Technology, Associate in Applied Science (MTT)

The associate in applied science degree in Machine Tool Technology emphasizes the advanced manufacturing technologies. Students are prepared to work in precision tooling, machining, and manufacturing. Graduates could qualify for positions as machine tool operators; machinists; Computerized Numerically Controlled (CNC) machinists and programmers; Electrical Discharge Machine (EDM) operator/programmers; computer-aided drafting/design and computer-aided machining/manufacturing (CAD-CAM) programmers, toolmakers, mold makers and inspectors.

Upon successful completion of this program, students should be able to:
• Analyze, interpret, qualify and apply engineering specifications for the production of manufactured/machined parts, and, assist in solving engineering related problems.
• Solve routine problems associated with work-cell (shop floor) machining/manufacturing.
• Demonstrate continuous knowledge and skill development traits required for mastery of advanced technologies.
• Decipher and evaluate the impact of shop-floor technologies.
• Communicate advanced technological concepts in an oral, written, and graphical format.
• Formulate a means for continuous evaluation of personal growth requirements to assure technological preparedness in managing a career in the challenging field of precision machining/manufacturing.
• Operate conventional and Computer Numerically Controlled machine (CNC) tools and other automated equipment.
• Program machine tools and related equipment via the use of Computer Aided Manufacturing (CAM) system hardware and software.
• Validate, via inspection, and process documents, the readiness of products for customer distribution.

First Semester Credits
*MAT 110 Technical Mathematics I .................................. 4
MTT 110 Print Layout and Measurement for Machining ........ 4
MTT 111 Introduction to Manufacturing .......................... 3
TCC 111 Technical Communication .............................. 3
MTT 112 Lathe Operations I ........................................ 3
48 CAREER PROGRAMS, ASSOCIATE DEGREE

Mechanical Technology
Associate in Applied Science (ATEC)

The associate degree in Mechanical Technology is designed to prepare graduates with the knowledge and skills required of technicians in a variety of industrial fields.

Upon successful completion of this program, students should be able to:

• Create engineering drawings and related documents for design using computer-assisted techniques.
• Plan and implement technical projects under engineering supervision.
• Assist in the design of mechanical and electro/mechanical systems in accordance with standard engineering practices.
• Present technical and graphical information in an organized fashion.
• The associate degree in applied science will be awarded after satisfactory completion of this four-semester program.

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENG 100 English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>*MAT 110 Technical Mathematics I</td>
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</tr>
<tr>
<td>TCC 111 Technical Communication</td>
<td>3</td>
</tr>
<tr>
<td>TCC 112 CADD Graphics</td>
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<tr>
<td>TME 111 Machining Technology</td>
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<tr>
<td>** Social Science Elective</td>
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Second Semester

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>*MAT 111 Technical Mathematics II</td>
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<tr>
<td>PHY 100 Technical Physics I</td>
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Total Credits Required: 65

**MAT 140, MAT 141 or MAT 160, MAT 161 may be elected instead.

**Social Science Electives (SOC 100 to 200), American History II (HIS 120), or, Microeconomics Principles (ECO 220)

**Suggested machining electives: Manufacturing Processes (MTT 213), Technical Mechanics (TME 231), Statics and Strength of Materials (TME 216), Project Management Processes (TCC 121), Robotics and Programmable Logic Controllers (TME 220), Fluid Power and Controls (TME 229), Robotic Systems (TME 232), Introduction to Nanotechnology (SCI 105), Co-op/Internship, any 3 or 4 credit combination.

Medical Assistant,
Associate in Applied Science (MED)

The Medical Assistant program prepares students as multi-skilled health care workers who function as assistants to physicians in a variety of ambulatory care settings. The responsibilities of the medical assistant include administrative and clinical duties. The Delaware County Community College Medical Assisting program is accredited by the Commission on Accreditation of Allied Health Education Programs (www.cahep.org), upon the recommendation of the Curriculum Review Board of The American Association of Medical Assistants Endowment (AAMAE).

All medical assistant applicants are required to submit a “Criminal History Record Information Report” and be free of any conviction of elder or child abuse for 10 years prior to beginning the first clinical course.

Selected clinical externships will be provided in local medical offices and health care clinics under the supervision of the allied health faculty. These externships are work/learning experiences for which the student receives no monetary remuneration or other reimbursement.

Medical assistant applicants are required to take college placement tests in math, reading and English skills. Any deficiencies must be remedied prior to registering for Medical Assistant Techniques and Practicum I (AHM 106).

Certain manual dexterity and sensory abilities that will enable the student to competently perform required technical skills are necessary for successful completion of the Medical Assistant program. Health problems that can interfere with the applicant’s ability to meet program competencies are considered individually.

All medical assistant students will need to have on file in the Health Center the results of a complete physical examination including: laboratory tests, a complete blood count, serology, a 9-panel urine drug screen and TB testing prior to beginning the clinical component of the program. Please refer to the pre-entrance medical record health form requirements from the Health Center. Additionally, students must have medical health insurance and be in compliance with recommendations for the Hepatitis B vaccine. Full CPR
A certificate program is also available. See page 64.

Nanofabrication Manufacturing Technology, Associate in Applied Science (NMT)

The NMT program introduces a series of new courses and an associate degree with an emphasis on high-tech industries. The goal of this program is to prepare graduates for employment as entry-level nanofabrication technicians. Nanofabrication manufacturing involves making devices at the smallest dimensions and was first used in the semiconductor (computer chip) industry.

Upon successful completion of this program, students should be able to:

- Describe the operation and application of commonly used electronic components and circuits.
- Repair malfunctions in electrical and electro-mechanical instruments.
- Fix electrical and electro-mechanical instruments.
- Regulate scientific and industrial instruments.
- Examine input/output parameters of electrical/mechanical devices.
- Construct electrical and electro-mechanical devices.
- Demonstrate an understanding of the terminology, procedures, equipment, and processes used in semiconductor processing.
- Demonstrate safe and appropriate maintenance techniques for basic semiconductor processing equipment.
- Operate nanofabrication processing equipment with a focus on safety, environmental and health issues.
- Demonstrate a thorough understanding of the materials handling procedures related to advanced electronic and manufacturing technologies.
- Identify material and physical hazards associated with basic semiconductor processing equipment.
- Communicate advanced technical concepts in an oral, written, and graphical form.
- Use the computer in reporting, analyzing, and researching technical information.
- Provide an active problem-solving link between engineers and production personnel.
- Record relevant information in a working lab notebook.
- Identify industries using nanofabrication technology such as opto-electronics, biomedical, sensors, flat panel displays, information storage, microelectromechanical devices, micro-fluidics, solar cells, and microelectronics.

First Semester Credits
AHM 104 Body Structure/Function I .................................................. 3
AHM 233 Medical Terminology ......................................................... 3
ENG 100 English Composition I ....................................................... 3
DPR 100 Introduction to Computers ................................................... 3
PSY 140 General Psychology .......................................................... 3

Second Semester Credits
AHM 105 Body Structure/Function II ................................................ 3
AHM 140 Professional and Communication Issues in Health Care ......... 3
AHM 100 Orientation to Health Care ................................................ 3
ENG 112 English Composition II ....................................................... 3

Third Semester, Summer I Credits
AHA 207 Ethical/Legal Aspects of Health Care Management .............. 3
AHM 106 Medical Assistant Techniques and Practicum I .................... 4
AHM 185 Medical Office Management ............................................. 3
SOC 110 Introduction to Sociology ................................................... 3

Fourth Semester Credits
AHM 107 Medical Assistant Techniques and Practicum II .................. 4
AHM 108 Conditions of Illness ......................................................... 3
AHM 130 Medical Coding Concepts for Allied Health ....................... 3
AHM 220 Applied Microbiology ....................................................... 1
______ Humanities Elective .............................................................. 3

Summer I or II Credits
AHM 199 Medical Assistant Externship ........................................... 6

Total Credits Required: 60

A certificate program is also available. See page 64.
Third Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 106</td>
<td>Introduction to Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>TEL 111</td>
<td>Electronics II</td>
<td>4</td>
</tr>
<tr>
<td>TEL 210</td>
<td>Troubleshooting and Repair</td>
<td>4</td>
</tr>
<tr>
<td>SCI 105</td>
<td>Introduction to Nanotechnology</td>
<td>3</td>
</tr>
<tr>
<td>COMM100</td>
<td>Introduction to Interpersonal Communication</td>
<td>3</td>
</tr>
</tbody>
</table>

A unique feature of this program is that students take their final semester of study at the University Park campus of Penn State. Students enroll in the Electronics technology program during their first three semesters at Delaware County Community College. During the final semester, students are registered as DCCC students but spend the entire semester in a hands-on training experience in nanofabrication manufacturing at Pennsylvania State University. A total of 18 credit hours are taken to complete the capstone semester. The six courses are presented sequentially in three phases for five weeks each. The first phase covers TEL 260 and TEL 261 followed by TEL 262 and TEL 263, and finally TEL 264 and TEL 265. Students who successfully complete the four-semester program are awarded an Associate Degree in Applied Science in Nanofabrication Manufacturing Technology.

Fourth Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEL 260</td>
<td>Materials Safety, Health Issues and</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Equipment Overview for Nanofabrication</td>
<td></td>
</tr>
<tr>
<td>TEL 261</td>
<td>Basic Nanofabrication Processes</td>
<td>3</td>
</tr>
<tr>
<td>TEL 262</td>
<td>Thin Films in Nanofabrication</td>
<td>3</td>
</tr>
<tr>
<td>TEL 263</td>
<td>Advanced Lithography and Dielectrics for</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Nanofabrication</td>
<td></td>
</tr>
<tr>
<td>TEL 264</td>
<td>Materials Modification in Nanofabrication</td>
<td>3</td>
</tr>
<tr>
<td>TEL 265</td>
<td>Characterization, Packaging and Testing of</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Nanofabricated Structures</td>
<td></td>
</tr>
</tbody>
</table>

Total Credits Required: 72 credits

*Social Science Elective (SOC 100 to 200); American History II (HIS 120); or, Microeconomics Principles (ECO 220).

Nursing, Associate in Applied Science (NURS)

The mission of the DCCC associate degree nursing program is to provide a curriculum where students, committed to the value of caring, can develop competencies essential to safe, effective nursing practice in a variety of health care settings within the community.

The nursing curriculum prepares students for positions as beginning staff nurses in a variety of settings; i.e. acute- and long-term/transitional care facilities and community settings.

Upon successful completion of the curriculum, students receive an associate in applied science (AAS) degree and are eligible to sit for the state licensure examination to become registered nurses (NCLEX-RN).

Most nursing students attend classes at the College and off-campus sites. For residents of Chester County, two sections are available with nursing classes at The Chester County Hospital.

Selected clinical laboratory learning experiences, under the direct guidance of nursing faculty, are provided at a variety of health-care agencies. The purpose of these experiences is to provide the student with the opportunity to apply classroom learning in direct patient-care situations.

All nursing applicants are required to complete and submit a criminal record check and a Child Abuse Clearance form.

Under Pennsylvania law, the State Board of Nursing may not issue a license to an applicant who has been convicted of a felony act prohibited by the Controlled Substance, Drug, Device and Cosmetic Act, or convicted of a felony relating to a controlled substance in a court of law of the United States or any other state, territory or country unless 10 years have elapsed since the date of conviction and the applicant can demonstrate that he/she has made significant progress in personal rehabilitation.

Students who have been convicted of a prohibitive offense contained in Act 13 and/or Act 169 (detailed list available for review in the Admissions and Allied Health offices) may not be able to complete their studies because clinical experiences needed for course/program success may be prohibited. If a student cannot complete their clinical studies, they will not be accepted into the nursing program.

The nursing program is accredited by the National League for Nursing Accrediting Commission, 61 Broadway, New York, NY 10006, 212-363-5555, www.nlnac.org. It is also approved by the Pennsylvania State Board of Nurse Examiners, P.O. Box 2649, Harrisburg, PA 17105-2649, 717-783-7142, www.dos.state.pa.us. Program outcomes are defined and measurable.

Upon successful completion of this program, students should be able to:

- Integrate theories and concepts of biopsychosocial sciences and liberal arts in the application of the nursing process.
- Provide responsible, accountable nursing care for multicultural individuals and groups in a variety of health care settings.
- Utilize critical thinking, therapeutic nursing interventions, and communication skills and techniques to meet the basic needs of individuals of all ages experiencing common and/or complex health problems.
- Practice within the ethical and legal framework of nursing.
- Use patient advocacy skills while managing care that contribute to positive outcomes.
- Demonstrate commitment to continuous personal and professional development.
- Contribute to the improvement of nursing practice through committee participation and membership in professional nursing organizations.

Students must progress through the curriculum in sequence.

All nursing students who have a course with a clinical component will need to have on file in the Health Center the results of a complete physical examination including: laboratory tests, a complete blood count, a 9 panel drug screen, serology and TB testing. A complete physical examination is required prior to taking the first nursing course. Additionally, these students must have medical health insurance and be in compliance with recommendations for the Hepatitis B vaccine. Certain manual dexterity and sensory skills that enable the student to competently perform required technical skills are necessary for successful completion of the nursing program. Health problems that can interfere with the applicants ability to demonstrate achievement of program competencies are considered individually.

Credits for BIO 117 and BIO 118 must be current within five academic years of the date of beginning the first clinical nursing course and students must achieve a “C” grade in BIO 117 and BIO 118.

Any remediation in English and reading must be satisfied before beginning Fundamentals of Nursing (NUS 110). All NUS 110 students must meet a math requirement either by passing a Math Equivalency Test given during Spring Orientation sessions or by passing NUS 102, Math for Nurses. The competency to solve basic mathematical problems related to dosage calculation is a component of Nursing 110. PLEASE NOTE: Entry into Nursing Concepts and Practice I (NUS 111) will be denied to any student who has not mastered the mathematical competencies of NUS 110. It is recommended that Math for Nurses (NUS 102) be taken prior to Nursing 110. NUS 102 requires mathematics at the developmental level (MAT 060).

Students can repeat the following nursing courses (NUS 110, NUS 111, NUS 210 or NUS 211) at a specific level only once.

Students who fail or withdraw from a nursing course and wish to repeat said course must:

- Have a GPA of 2.5.
- Petition for readmission through the Nursing department, not the College Admissions office. Students may “wait out” or defer re-entering the program.
only a total of three years beginning with the last semester attended in nursing. CPR certification is required for all students in the program. You must submit a photocopy (both sides) of “Health Care Provider” (American Heart Association at 610-940-9540, which is renewable every two years) or “Course for the Professional” (American Red Cross at 610-566-4580, which is renewable annually) to the College Health Nurse by the last Thursday in July of each academic year. “BCLS” and “Heart Saver” are not acceptable! Certification must be inclusive until the end of May. Certifications that expire prior to May will not be accepted even if recertification prior to May is provided by an employer.

Students are responsible for purchasing uniforms and other related materials deemed necessary for the clinical laboratory experiences of the program. Each semester students are assessed additional costs ($60 per semester) for standardized tests to compare achievement against national norms. In addition, each student must carry professional liability insurance to protect him/herself and the health agency in the event of any legal action following any error in nursing practice. A $5.00 fee will be added to your tuition bill each semester in which you participate in a clinical experience.

Special Options
1. Licensed Practical Nurses, corpsmen, and candidates who have had one year of successful previous nursing school experience may qualify for advanced placement in the program. In addition, an advanced placement option is available to LPNs who have graduated from an NLNAC accredited program with a minimum of 1,000 clinical work experience as an LPN. Students will receive credit for the first year of the nursing program after meeting certain criteria. Contact a counselor in the Assessment Center for additional information.

2. A five-semester evening/weekend option is available. Course sequencing begins in January. Criteria for admission and progression are the same as for the generic curricula.

Program of Study and Graduation Requirements
The degree of associate in applied science is awarded upon successful completion of the nursing course sequence with a grade of “C” or better in all nursing courses; a satisfactory grade for related clinical experiences and satisfactory completion of performance practicum’s and course requirements; attainment of a grade point average of 2.0 (“C” average) and completion of 70 or 71 credit hours. A “C” grade in nursing is equivalent to the numerical grade of 75.

See Electives Listing, Page 70.

Curricular Sequence: Day Program

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 117 Human Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>ENG 100 English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>PSY 140 General Psychology</td>
<td>3</td>
</tr>
<tr>
<td>NUS 110 Fundamentals of Nursing</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 118 Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>ENG 112 English Composition II</td>
<td>3</td>
</tr>
<tr>
<td>PSY 210 Lifespan Human Development</td>
<td>3</td>
</tr>
<tr>
<td>NUS 111 Nursing Concepts and Practice I</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>20</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Third Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSY 220 Abnormal Psychology</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110 Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>NUS 210 Nursing Concepts and Practice II</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td><strong>16</strong></td>
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<table>
<thead>
<tr>
<th>Fourth Semester</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>__________ Humanities or Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>_________ Nursing Elective</td>
<td>3</td>
</tr>
<tr>
<td>NUS 221 Pharmacology for Health Care (3 credits)</td>
<td>(OR)</td>
</tr>
<tr>
<td>NUS 220 Clinical Enhancement Skills (3 credits)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Select 3 or 4 one-credit nursing courses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUS 215 Basic Arrhythmia Interpretation (1 credit)</td>
</tr>
<tr>
<td>NUS 216 Phlebotomy &amp; EKG (1 credit)</td>
</tr>
<tr>
<td>NUS 217 IV Skills (1 credit)</td>
</tr>
<tr>
<td>NUS 219 Advanced Physical Assessment (1 credit)</td>
</tr>
<tr>
<td>NUS 211 Nursing Concepts and Practice III</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
</tr>
</tbody>
</table>

Total Credits Required: 70

Curricular Sequence: Evening/Weekend Program

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 100 English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>SOC 110 Introduction to Sociology</td>
<td>3</td>
</tr>
<tr>
<td>__________ Humanities or Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>PSY 140 General Psychology</td>
<td>3</td>
</tr>
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<td><strong>Total Credits</strong></td>
<td><strong>12</strong></td>
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<table>
<thead>
<tr>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUS 110 Fundamentals of Nursing</td>
</tr>
<tr>
<td>BIO 117 Human Anatomy</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
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<table>
<thead>
<tr>
<th>Third Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUS 111 Nursing Concepts and Practice I</td>
</tr>
<tr>
<td>ENG 112 English Composition II</td>
</tr>
<tr>
<td>PSY 210 Lifespan Human Development</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
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<table>
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<tr>
<th>Fourth Semester</th>
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<tbody>
<tr>
<td>NUS 210 Nursing Concepts and Practice II</td>
</tr>
<tr>
<td>ENG 112 English Composition II</td>
</tr>
<tr>
<td>PSY 220 Abnormal Psychology</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fifth Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUS 221 Pharmacology for Health Care (3 credits)</td>
</tr>
<tr>
<td>NUS 220 Clinical Enhancement Skills (3 credits)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Select 3 or 4 one-credit nursing courses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUS 215 Basic Arrhythmia Interpretation (1 credit)</td>
</tr>
<tr>
<td>NUS 216 Phlebotomy &amp; EKG (1 credit)</td>
</tr>
<tr>
<td>NUS 217 IV Skills (1 credit)</td>
</tr>
<tr>
<td>NUS 219 Advanced Physical Assessment (1 credit)</td>
</tr>
<tr>
<td>NUS 211 Nursing Concepts and Practice III</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
</tr>
</tbody>
</table>

Total Credits Required: 70
Paralegal Studies, Associate in Applied Science (PLG)

Approved by the American Bar Association (ABA)

Paralegal Studies is an associate degree program intended to train a generalist paralegal. Graduates are likely to find employment as paralegals under the direction of attorneys (to do otherwise would be practicing law without a license) in law firms, legal departments of large corporations, insurance companies, title companies, legal service companies and federal, state or local governmental agencies. In short, wherever lawyers are employed, paralegals are likely to be lawfully employed.

Students who wish to pursue additional education in law or in other disciplines, as part of their future plans should consult with an advisor before selecting courses.

Upon successful completion of this program, students should be able to:
• Conduct legal research to identify the appropriate laws, judicial decisions, regulations and other legal literature applicable to specific legal problems.
• Research and draft written memoranda as directed by an attorney.
• Research and draft pleadings and other legal documents as directed by an attorney.
• Investigate and develop the facts of a case under the direction of an attorney.
• Assist an attorney to prepare a case for trial and assist during trial.
• Maintain all relevant case documents.
• Maintain files of a case including but not limited to correspondence, pleadings, reports and briefs.
• Draft basic documents applicable to contracts, real estate transactions, domestic relations, and estates, trusts and wills as well as other appropriate legal documents.
• Apply modern technology to the performance of legal work and tasks.
• Identify and analyze the ethical issues that arise for the Paralegal Professional

See Electives Listing, Page 70.

First Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENG 100</td>
<td>English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>DFR 100</td>
<td>Introduction to Computers</td>
<td>3</td>
</tr>
<tr>
<td>PLG 100</td>
<td>Introduction to Paralegalism</td>
<td>3</td>
</tr>
<tr>
<td>PLG 110</td>
<td>Legal Research and Writing I</td>
<td>3</td>
</tr>
<tr>
<td>___________</td>
<td>Social Science Elective</td>
<td>3</td>
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Second Semester

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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COM 100</td>
<td>Introduction to Interpersonal Communication</td>
<td>3</td>
</tr>
<tr>
<td>PLG 120</td>
<td>Legal Research and Writing II</td>
<td>3</td>
</tr>
<tr>
<td>PLG 140</td>
<td>Contract Law</td>
<td>3</td>
</tr>
<tr>
<td>___________</td>
<td>*Math or MAT Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>___________</td>
<td>Social Science/Humanities Elective</td>
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</tr>
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Third Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 100</td>
<td>Applied Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ENG 112</td>
<td>English Composition II</td>
<td>3</td>
</tr>
<tr>
<td>PLG 200</td>
<td>Family/Domestic Relations Law</td>
<td>3</td>
</tr>
<tr>
<td>PLG 210</td>
<td>Civil Litigation and Tort Principles</td>
<td>3</td>
</tr>
<tr>
<td>___________</td>
<td>Science Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
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Fourth Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLG 211</td>
<td>Civil Litigation and Tort Applications</td>
<td>3</td>
</tr>
<tr>
<td>PLG 220</td>
<td>Real Estate Law</td>
<td>3</td>
</tr>
<tr>
<td>PLG 230</td>
<td>Estates, Wills and Trusts</td>
<td>3</td>
</tr>
<tr>
<td>PLG 199</td>
<td>Co-op Internship/Paralegal Electives</td>
<td>3</td>
</tr>
<tr>
<td>___________</td>
<td>PLG Paralegal Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
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<td><strong>15</strong></td>
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</tbody>
</table>

Total Credits Required: 60

* Business Math (MATH 105) or any mathematics course numbered MAT 120 or higher. A certificate program is also available. See page.

Paramedic - Advanced Life Support, Associate in Applied Science (EMTP)

DCCC has instituted the following prerequisites and entrance requirements for individuals seeking enrollment in the Paramedic - Advanced Life Support program.

Prerequisites: Current Emergency Medical Technician (EMT) Certification (Pennsylvania or National Registry)
Current Healthcare Provider level Cardiopulmonary Resuscitation (CPR) (American Red Cross or American Heart Association)

Admissions criteria:
• Oral interview
• Attain a score of 70% on a 100 question EMT written examination
• Demonstration of proficient trauma, medical and CPR skills during practical examination
• Criminal Background Check
• Child Abuse Background Check
• Physical Examination and Drug Testing
• DCCTC Placement Test
• GED/High School Diploma
• Valid Driver’s License

Delaware County Community College Director for Public Safety Programs admits individuals to this program.

The Associate in Applied Science Degree: Paramedic - Advanced Life Support program is designed for individuals who are seeking careers as paramedics and/or careers that are related to medical emergencies. The primary focus of the program is to provide an educational vehicle and skill set for emerging paramedic professionals. The technical core of the program focuses on the knowledge and skills required to effectively manage and mitigate emergency medical disasters. The competencies and course content have been developed with significant consideration of the coursework developed by the Emergency Medical Technician-Paramedic (EMT-P): The National Standard Curriculum.

Upon successful completion of this program, the student should be able to:
• Demonstrate communication skills.
• Record documentation accurately.
• Perform pharmacology mathematical skills.
• Perform mathematical calculation skills.
• Demonstrate the ability to comprehend, apply, and evaluate clinical information.
• Demonstrate technical proficiency in all skills necessary to fulfill the role of a paramedic.
• Demonstrate personal behaviors consistent with professional and employer expectations.

First Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 117</td>
<td>Human Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>EMS 203</td>
<td>Introduction to Advanced Life Support I</td>
<td>4</td>
</tr>
<tr>
<td>ENG 100</td>
<td>English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>NUS 102</td>
<td>Nursing Mathematics:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dosage Calculation and Drug Preparation</td>
<td>1</td>
</tr>
<tr>
<td>EMS 205</td>
<td>Introduction to Advanced Life Support II</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>14</strong></td>
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Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>EMS 120</td>
<td>Airway Management and Ventilation</td>
<td>3</td>
</tr>
<tr>
<td>EMS 110</td>
<td>Patient Assessment</td>
<td>3</td>
</tr>
<tr>
<td>BIO 118</td>
<td>Human Physiology</td>
<td>4</td>
</tr>
<tr>
<td>EMS 140</td>
<td>Trauma Systems and Mechanisms of Injury</td>
<td>5</td>
</tr>
<tr>
<td>ENG 112</td>
<td>English Composition II</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>18</strong></td>
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</tbody>
</table>
**Third Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS 210 Medical Emergencies</td>
<td>4</td>
</tr>
<tr>
<td>EMS 220 Paramedic Concepts</td>
<td>6</td>
</tr>
<tr>
<td>EMS 136 Special Considerations-Assessment</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits Required:</strong></td>
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**Fourth Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS 211 Medical Emergencies II</td>
<td>4</td>
</tr>
<tr>
<td>EMS 221 Paramedic Concepts II</td>
<td>6</td>
</tr>
<tr>
<td>Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits Required:</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

**Total Credits Required: 61**

**Respiratory Therapy, Associate in Applied Science (RESP)**

The Respiratory Therapy curriculum prepares allied health specialists for the management, treatment, testing and care of patients with breathing abnormalities.

All Respiratory Therapy applicants are required to submit a “Criminal History Record Information Report” and be free of any conviction of elder or child abuse for 10 years prior to beginning the first clinical course. Admitted students must pass a drug test prior to beginning the program. This service will be provided at a special college planning for advisement and registration for clinical.

All Respiratory Therapy students will need to have on file in the Health Center the results of a complete physical examination including: laboratory tests, a complete blood count, serology and TB testing. Additionally, these students must have medical health insurance and be in compliance with recommendations for the Hepatitis B vaccine. Certain manual dexterity and sensory skills are necessary for successful completion of the Respiratory Therapy program. Health problems that can interfere with the applicant’s ability to demonstrate achievement of program competencies are considered individually.

Upon successful completion of this program, students should be able to:

- Administer therapeutic medical gases.
- Administer cardiopulmonary resuscitation.
- Provide appropriate mechanical assistance to support respiration when necessary.
- Administer drugs that are given through inhalation procedures.
- Maintain all equipment used in respiratory support.
- Perform diagnostic pulmonary function testing and blood-gas analysis.
- Exercise judgment and accept responsibility in therapeutic procedures based on observation of patients and knowledge of anatomy, physiology, pharmacology and clinical medicine.
- Students must progress through the curriculum in sequence. Students must maintain a GPA of 2.0 to remain in the program. Credits for BIO 117 and BIO 118 must be current within five academic years of the date of beginning the program. Students must achieve a grade of “C” or better in BIO 117, BIO 118 and CHE 110.
- Any remediation in English and reading must be satisfied before beginning the program. Students who fail or withdraw from a respiratory therapy course and wish to repeat said course must:
  - Have a GPA of 2.5.
  - Petition for readmission is made through the Respiratory Therapy department, not the College Admissions office. Readmission to the program is on a space available basis and only if the student can graduate within two years of his/her initial class. If a student is granted reentry into the program at his/her exit point, an objective evaluation will be used to determine if the placement of the student within the curriculum is appropriate. Upon readmission to the program, the student must complete the program within two years following the graduation of his/her initial class.

The Pennsylvania State Board of Medicine reserves the right to deny a license to any candidate who has been convicted of a felony or any offense relating to the use or sale of alcohol or controlled substances in Pennsylvania or any other state.

In addition to normal tuition and fees, respiratory therapy students are required to purchase uniforms, insurance and miscellaneous supplies.

Upon completion of the two-year program with a grade of “C” or better in all respiratory therapy courses, the degree of associate in applied science is awarded. The graduate is immediately eligible for the Entry-Level Certification Examination and after passing the Entry-Level Certification Examination, the student is eligible for the Advanced Practitioner’s Examination. Upon successful completion of the Advanced Practitioner’s Examination, the credential Registered Respiratory Therapist is awarded.

---

**First Year, First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTH 100 Respiratory Therapy Principles I</td>
<td>4</td>
</tr>
<tr>
<td>RTH 101 Respiratory Therapy Practicum I</td>
<td>4</td>
</tr>
<tr>
<td>BIO 117 Human Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>PHY 140 General Psychology</td>
<td>3</td>
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<tr>
<td><strong>Total Credits Required:</strong></td>
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**First Year, Spring Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTH 102 Respiratory Therapy Principles II</td>
<td>2</td>
</tr>
<tr>
<td>RTH 103 Respiratory Therapy Practicum II</td>
<td>6</td>
</tr>
<tr>
<td>CHE 110 General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>BIO 118 Human Physiology</td>
<td>4</td>
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<td><strong>Total Credits Required:</strong></td>
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</table>

**First Year, Summer I Semester**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>RTH 104 Respiratory Therapy Summer Clinical I</td>
<td>5</td>
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**First Year, Summer II Semester**

**Second Year, Fall Semester**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>RTH 200 Respiratory Therapy Principles III</td>
<td>3</td>
</tr>
<tr>
<td>RTH 201 Respiratory Therapy Clinical Practicum III</td>
<td>6</td>
</tr>
<tr>
<td>RTH 204 Pulmonary Pathophysiology Clinical Rounds I</td>
<td>2</td>
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<tr>
<td>ENG 100 English Composition I</td>
<td>3</td>
</tr>
<tr>
<td>AHM 220 Applied Microbiology</td>
<td>1</td>
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<td><strong>Total Credits Required:</strong></td>
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**Second Year, Spring Semester**

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<thead>
<tr>
<th>Course</th>
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</tr>
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<tbody>
<tr>
<td>RTH 202 Respiratory Therapy Principles IV</td>
<td>3</td>
</tr>
<tr>
<td>RTH 203 Respiratory Therapy Clinical Practicum IV</td>
<td>6</td>
</tr>
<tr>
<td>RTH 205 Pulmonary Pathophysiology Clinical Rounds II</td>
<td>2</td>
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<tr>
<td>ENG 112 English Composition II</td>
<td>3</td>
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<tr>
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<td><strong>Total Credits Required:</strong></td>
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**Second Year, Summer I Semester**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>RTH 206 Respiratory Therapy Summer Clinical III</td>
<td>4</td>
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</table>

**Total Credits Required: 77**

*MAT 100 will be prerequisite to the program (or demonstrate equivalent competence on placement exam).
Small Business Management, Associate in Applied Science (BUSC)

The Small Business Management program is designed to prepare students in both operational and skill aspects of the small enterprise. Such preparation will equip students with specific areas of skills or management to either enter an existing small firm or begin their own entrepreneurial enterprise.

Courses are designed so that the student, through logical steps, understands the principles unique to small business operation. The 60-61 credit program leads to the awarding of the associate in applied science degree.

Practical knowledge in small business management, finance, marketing, sales, advertising and supervision are designed to prepare students for entry-level needs. Generally, transfer is not intended through this program. The associate dean, business/computer information systems, should be consulted when considering use of credits for transfer. College-sponsored Experiential Learning may be taken for credit while working in a small business with specific managerial duties.

Upon successful completion of this program, students should be able to:

- Use terms and tactics within the small business environment.
- Be able to develop a marketing plan.
- Analyze and resolve problems involving financial statement comparisons.
- Create advertising promotions appropriate to the small business.
- Demonstrate the skills necessary to operate office equipment commonly used in the small company.
- Show proficiency in microcomputer applications within the management and operating needs of the small business environment.
- Understand personal qualities needed to function effectively with individuals in supervision, evaluation and control.
- Develop effective communication to administer policy both internally and externally.

See Electives Listing, Page 70.

### First Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ENG 100</td>
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<td>BUS 149</td>
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<td>MATH 105</td>
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**Total Credits:** 15

### Second Semester

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<tr>
<td>ENG 112</td>
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<tr>
<td>ACC 100</td>
<td>3</td>
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<tr>
<td>BUS 233</td>
<td>3</td>
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<tr>
<td>DPR 100</td>
<td>3</td>
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<tr>
<td>BUS 215</td>
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**Total Credits:** 15

### Third Semester

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<th>Course</th>
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<tbody>
<tr>
<td>BUS 130</td>
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<tr>
<td>BUS 230</td>
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<tr>
<td>BUS 110</td>
<td>3</td>
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**Total Credits:** 16

### Fourth Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>BUS 231</td>
<td>3</td>
</tr>
<tr>
<td>BUS 211</td>
<td>3</td>
</tr>
<tr>
<td>BUS 199</td>
<td>3</td>
</tr>
<tr>
<td>____</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits:** 15

**Total Credits Required:** 60-61

A certificate program is also available. See Page 69.

Surgical Technology, Associate in Applied Science (ORT)

The Surgical Technology program prepares students to function as surgical technologists under the supervision of registered professional nurses or licensed physicians. The program includes courses in general and technical education. Selected clinical experiences are provided in local hospitals under the supervision of a College nurse instructor.

All Surgical Technology applicants are required to submit a “ Criminal History Record Information Report.”

Based on student ability and clinical focus, this program offers a multi-competency experience that prepares graduates for positions in the operating room, central processing department, dialysis unit or ambulatory surgery unit. In addition to normal tuition and fees, the surgical technology student is required to purchase protective eyewear and regulation shoes. AHM 220 (Applied Microbiology) and remediation in English and reading must be satisfied before beginning AHS 100. Students who fail or withdraw from a surgical technology course and wish to repeat that course must:

- Have a GPA of 2.5.
- Petition for readmission through the Surgical Technology department, not the College Admissions office. Students may repeat the surgical technology courses only once! Students may “wait out” of the program only a total of three years beginning with the last semester attended in surgical technology.
- Full CPR certification is required for all students before entry into clinical courses. You must submit a photopy (both sides) of “Health Care Provider” (American Heart Association at 610-940-9540, which is renewable every two years) or “Course for the Professional” (American Red Cross at 610-566-4580, which is renewable annually) to the College Health Nurse prior to the first day of class. “BCLS” and “Heart Saver” are not acceptable! Certification must be inclusive from September 1 through June 30 of each year.

All Surgical Technology students who have a course with a clinical component will need to have on file in the Health Center the results of a complete physical examination including: laboratory tests, a complete blood count, serology and TB testing. Additionally, these students must have medical health insurance and be in compliance with recommendations for the Hepatitis B vaccine. Second-year surgical technology students are required to have a record of a physical examination prior to the beginning of the third term.

Upon successful completion of this program, the student, under direct supervision of a registered professional nurse or licensed physician, should be able to:

- Identify the responsibilities of the surgical-team member in the care of the surgical patient.
- Prepare the surgical suite for an operation.
- Prepare the patient, physically and psychologically, for surgery.
- Assist the surgical team throughout the intraoperative period.
- Assist in patient care during the immediate postoperative period.

Students may be dropped from the curriculum for violation of patient safety and/or behavior inconsistent with professional standards pending the outcome of the appeal process.

An associate in applied science degree will be awarded upon successful completion of the required program with a “C” or better in all surgical technology courses. The graduate is eligible to write the examination for national certification administered through the Association of Surgical Technologists (AST).

See Electives Listing, Page .

Prerequisite to AHS 100, Applied Microbiology (AHM 220) 1 credit
First Semester

- AHS 100 Surgical Technology I ........................................... 6
- AHS 101 Surgical Technology Practicum I ......................... 4
- BIO 117 Human Anatomy .............................................. 4
- ENG 100 English Composition I ..................................... 3

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Second Semester

- AHS 102 Surgical Technology II ..................................... 4
- AHS 103 Surgical Technology Practicum II ...................... 6
- BIO 118 Human Physiology .......................................... 4
- AHM 140 Professional and Communication Issues in Health Care ................. 3

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Third Semester

- AHS 200 Surgical Technology III .................................. 1
- AHS 201 Surgical Technology Practicum III ..................... 6
- Humanities Elective .................................................... 3
- Open Elective ......................................................... 3

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Fourth Semester

- ENG 112 English Composition II ................................... 3
- SOC 110 Introduction to Sociology .................................. 3
- PSY 140 General Psychology ......................................... 3
- AHA 207 Ethical/Legal Aspects of Health Care Management ... 3
- Open Elective ......................................................... 3

15

Total Credits Required: 63

Technical Studies, Associate in Applied Science (TSTU)

The Technical Studies degree program is designed to provide recognition for work and life experience while assisting individuals in their preparation for career advancement or change. This program is designed to provide skills for personal, professional and community improvement. The program is highly individualized and flexible. As many as 20 credits may be awarded for work and life experience including military experience, trade/proprietary school preparation, apprenticeship programs, structured on-the-job training and the like.

Graduates will be awarded the associate in applied science degree upon successful completion of this program. Technical Studies has been designed as a first-degree program and therefore cannot be pursued as a second degree at DCCC.

Upon successful completion of this program, students should be able to:
- Formulate an educational plan designed to accomplish a personal/professional goal.
- Demonstrate an attitude of responsibility to self, employer and community.
- Communicate effectively in interpersonal and occupational activities.
- Advance in a career, building on already acquired skills and competencies.
- Display increased technical knowledge and skills.
- Demonstrate the comprehensive mathematical, scientific, physical, social and psychological skills necessary for personal career growth.
- Present technical information in oral, written and graphical form.

Technical Core:

Up to 20 credit-hours approved for prior work and life experience such as:
- Apprenticeship Training
- Military Training
- Trade/Proprietary Education

General Education:

Completion of a minimum of 21 credit hours as follows:
- English Composition I ................................................. 3
- English Composition II ................................................ 3
- *Mathematics/Accounting ........................................... 6-8
- Natural Science Elective ............................................. 3-4
- Social Science .......................................................... 3
- **Humanities Elective ................................................ 3

*Mathematics/Accounting

Requires consultation with a Technical Studies advisor:
MAT 110 or above must be used for programs with a Personal Education Plan (PEP) emphasis in Technical/Industrial and/or computer technology.
MAT 100 or MATH 105 and ACC 100 or ACC 111 may be used for programs that have an Entrepreneurship/Management emphasis.

As courses in ART, DRA, MUS (except MUS 160), ENG (all 200 and above) and SPE 100, 110 and 111 may be chosen to fulfill the Humanities elective.

Personalized Education Plan (PEP):

In consultation with a Technical Studies advisor, the student must satisfy a minimum of 20 or more credit hours of course work in a concentrated area of study in order to fulfill an employment need, or to work toward a personal, or a professional career goal. A typical PEP component could be selected with a concentration, or an emphasis of study approved by the Technical Studies Coordinator, and the appropriate division dean as suggested below:

I. Technical/Industrial Emphasis

- Courses selected in:
  - Automotive
  - Drafting and Design
  - Computer Science
  - Engineering
  - Automation/Robotics
  - Architectural/Construction
  - Heating, Ventilation and Air Conditioning
  - Machine Tool Technology
  - Electrical
  - Mathematics
  - Other similarly specialized concentration, or technical program courses

II. Computer Technology Emphasis

- Courses selected in:
  - Computers in Problem Solving
  - Computer Languages
  - Computer Operations
  - Computer Service
  - Computer Programming
  - Microcomputers
  - CAD/CAM
  - Other specialized computer courses

III. Entrepreneurship/Management Emphasis

- Courses selected in:
  - Introduction to Business
  - Emergency Management and Planning
  - Public Safety
  - Business Law
  - Principles of Management
  - Accounting
  - Human Behavior/Psychology
  - Marketing Supervision
  - Advertising
  - Sales
  - Economics
  - Other specialized entrepreneurship/management courses

NOTE: Total Credits Required (minimum) to satisfy this degree: 60

Any course substitution to an approved Personal Education Plan must be approved by a Technical Studies advisor, prior to course registration.
Professional Accounting, Certificate of Competency (ACC)

This program is designed for qualified college graduates interested in a career in accounting. The demand for qualified people in public accounting is great. Advancement in the field is limited only by the individual’s ability and is very rapid for the highly qualified. This program offers students the specific education needed to sit for the Certified Public Accountant’s examination. Those individuals without a bachelor’s degree may enroll in this program; however, the bachelor’s degree is required to sit for the CPA exam.

Upon successful completion of this program, students should be able to:
• Explain the importance of recognizing, measuring and reporting income and the content, purposes and limitations of a balance sheet.
• Identify and explain the accounting significance of transactions and events that cause the balance in owner’s equity to change.
• Discuss the ethical considerations facing the professional accountant in today’s business environment.

The program requires 18 credits of course work consisting of four core courses (12 credits) and two elective courses (6 credits). Students who lack adequate foundation courses are required to take the following courses:

ACC 111 Financial Accounting ........................................... 3
ACC 112 Managerial Accounting ........................................... 3

Core Curriculum
ACC 251 Intermediate Accounting I ................................ 3
ACC 252 Intermediate Accounting II .................................. 3
ACC 253 Advanced Accounting ............................................ 3
ACC 254 Auditing ............................................................. 3

Electives
ACC 115 Computerized Accounting .................................. 3
ACC 199 Co-op/Internship .................................................. 3
ACC 210 Federal Income Tax Accounting ................................. 3
BUS 220 Elementary Statistics ............................................... 3
BUS 241 Business Law I ....................................................... 3
BUS 242 Business Law II ......................................................... 3
BUS 243 Legal Environment of Business .................................. 3

Total Credits Required: 18

An Associate in Applied Science degree is also available. See page 32.

Automotive Technology I, Certificate of Competency (AUT)

This certificate is designed to prepare the student for entry-level positions in the automotive service industry. The Certificate of Competency in Automotive Technology I will be awarded upon successful completion of the minimum competencies as outlined below. Program completers will be prepared to seek positions as entry-level automotive service technicians and automotive mechanics.

Upon successful completion of this program, students should be able to:
• Identify tool and equipment nomenclature.
• Adhere to tool safety regulations.
• Explain the Occupational Safety and Health Act (OSHA) and the “right to know.”
• Utilize electronic and service manuals.
• Define the overview of the automobile and its major components.
• Install electronic pollution controls.
• Test, service and repair electronic pollution controls requirements.
• Repair electronic braking systems.
• Explain testing, service and repair requirements for electronic braking systems.
• Identify electronic controlled trip computers.
• Install warning, security, and sound systems.
• Prepare engines for removal.
• Disassemble, inspect, and clean engine parts.
• Inspect and measure crankshaft.
• Install bearing, pistons, piston rings, and crankshaft.
• Perform reconditioning of valve seats and valve stem seals.
• Remove the camshaft.
• Install timing components, gears chain, and belts.
• Inspect and service oil pumps.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AUT 100</td>
<td>Introduction to Automotive Service Operation and Shop Practices</td>
</tr>
<tr>
<td>AUT 101</td>
<td>Automotive Electricity and Electronics</td>
</tr>
<tr>
<td>AUT 102</td>
<td>Automotive Engines</td>
</tr>
<tr>
<td>AUT 103</td>
<td>Brake Systems</td>
</tr>
<tr>
<td>AUT 114</td>
<td>Steering and Suspension</td>
</tr>
<tr>
<td>AUT 115</td>
<td>Fuel I &amp; II</td>
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</tbody>
</table>

Total Credits Required: 20

Automotive Technology II, Certificate of Competency (AUTC)

This certificate is designed to prepare the student for above entry-level positions in the automotive service industry. The Certificate of Competency in Automotive Technology II will be awarded upon successful completion of the competencies outlined below.

Upon successful completion of this program, students should be able to:
• Define OBD (On-Board Diagnostic).
• Utilize testing tools to retrieve malfunction codes from the computer system.
• Identify importance of emission controls and emission control procedures.
• Test input sensors, and actuator sensors.
• Identify EGR (Exhaust, Gas, and Recirculation) Systems.
• Measure, assemble and install new parts as required.
• Differentiate between 4-wheel drive and all wheels drive vehicles.
• Service 4-wheel drive and all wheels drive vehicles.
• Identify hydraulic systems.
• Remove, overhaul and reinstall transmission/transaxle in vehicles.
• Restore units back to manufacturer’s specifications.
• Demonstrate using two or more 02 sensors.
• Solve case studies of vehicle engine parts and malfunctions.
• Utilize AC and DC test Instruments.
• Recognize delayed lighting and running lamps.
• Install and repair automatic locks, security and anti-theft devices.
• Install and repair radios and speakers systems.
• Replace and repair electronic heat grids on rear windows.
• Utilize automatic vehicle leveling systems

### Course Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AUT 121 Automotive Engine Performance</td>
<td>3</td>
</tr>
<tr>
<td>AUT 201 Automotive Chassis and Security Systems</td>
<td>2</td>
</tr>
<tr>
<td>AUT 150 Automotive Air Conditioning</td>
<td>2</td>
</tr>
<tr>
<td>AUT 151 Automotive Ignition System, Identification and Diagnosis</td>
<td>2</td>
</tr>
<tr>
<td>AUT 152 Computer and Emissions Systems</td>
<td>3</td>
</tr>
<tr>
<td>AUT 153 Manual Transmission/Transaxle and Chassis</td>
<td>3</td>
</tr>
<tr>
<td>AUT 200 Automotive Automatic Transmission/Transaxle</td>
<td>4</td>
</tr>
<tr>
<td>AUT 123 Power Train Controls</td>
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</tr>
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</table>

**Total Credits Required: 21**

### Residential Carpentry, Certificate of Competency (CPT)

This certificate is designed to prepare the student for entry-level positions in the occupational specialty of residential carpentry. The Certificate of Competency in Residential Carpentry will be awarded upon successful completion of the competencies as outlined below. Students who complete the program will be prepared to seek positions as entry-level carpenters. The program focuses on carpentry involving basic carpentry processes. Relevant theory and skills in solving basic mathematical problems, blueprint reading, and the safe use of hand tools, power tools and other equipment and materials of the trade will be addressed.

Upon successful completion of this program, students should be able to:

- Interpret plans.
- Lay out carpentry procedures.
- Identify the different structural components and their sequence as it relates to construction.
- Interpret building specifications and regulations as they relate to building construction.
- Estimate carpentry materials and labor costs to complete a project.
- Complete a rough carpentry project.
- Frame a structure.
- Perform finished carpentry work.
- Apply roofing material.
- Erect dry wall.
- Define roofing and siding terms.
- Describe and apply roofing felt, organic and/or fiberglass asphalt shingles and roll roofing.
- Apply aluminum and vinyl siding.
- Identify flash valleys, sidewalls, chimneys, and other roof obstructions.
- Cut and bend roll aluminum to fit exterior trim and soffits.
- Apply and cut fanfold exterior insulation.
- Estimate needed roofing and siding materials.
- Describe and apply wood shingles and shakes to roof underlayment.
- Flash hip-valley and ridge roofs according to specific application.
- Apply wood shingles and shakes to siding.
- Apply T111 siding (registered name of the manufacturer).
- Explain the uses and applications of brick, stone and stucco siding.
- Estimate required amounts of roofing and siding.

**Course Credit**

<table>
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<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>CPT 100 Introduction of Carpentry</td>
<td>4</td>
</tr>
<tr>
<td>CPT 101 Concepts of Carpentry Design</td>
<td>4</td>
</tr>
<tr>
<td>CPT 200 Advanced Framing Design</td>
<td>4</td>
</tr>
<tr>
<td>TCS 100 Blueprint Reading</td>
<td>3</td>
</tr>
<tr>
<td>OCS 102 International Code Council (ICC) Uniform Construction Code (UCC)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits Required: 21**

### Electives

- CPT 153 Advanced Furniture Building, 2
- CPT 150 Introduction to Cabinetmaking, 2
- CPT 151 Furniture Building, 2
- CPT 152 Home Remodeling/Additions, 2

### Finish Carpentry, Certificate of Competency (CPTC)

This certificate will provide the student with the technical skills and knowledge to lay out, cut, fabricate, erect, install and repair wooden structures and fixtures using hand and power tools. The program includes instruction in technical mathematics, framing, construction materials and selection, job estimating, blueprint reading, foundations and roughing-in, finish carpentry techniques and applicable codes and standards. The program prepares individuals for positions such as Finish Carpenters, Construction Estimators, Construction Planners and/or First-Line Supervisors.

Upon successful completion of this program, students should be able to:

- Select the proper window and door sizes based on rough openings and manufacturers specifications.
- Install windows on "New" house construction, replacement windows, and additional window placement.
- Select various types of window glazing, glazing materials, and installing glass.
- Construct and set doors frames.
- Identify and install door and window hardware.
- Describe various types, sizes, and uses of drywall panels.
- Describe hardware, adhesives, and applications of drywall.
- Make single and multi-ply drywall applications to interior walls and ceilings.
- Reinforce and conceal joints with tape and compound.
- Identify standard and crown moldings and their applications.
- Install window trim, including sills, aprons, jamb extensions, casings, and stop beads.
- Identify various types of staircases and balconies and their terminology.
- Perform mathematical calculations to determine proper tread rise and run of a staircase.
- Layout and fabricate plain, square cut, mitered and housed stringers and stair horses.
- Layout and fabricate platforms and landings.
- Construct and install balusters, newels, and handrails.
- Fabricate and install balcony skirts.
- Utilize existing building codes to comply with code enforcement regulations.
- Describe the types, sizes, and grades of hardwood flooring.
- Apply strip, plank, and parquet flooring.
- Estimate quantities of wood finish flooring required for various installations.
- Apply underlayment and resilient tile floor.
- Apply special underlayment and pre-finished floor systems.
- Finish wood flooring.

**Course Credit**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPT 154 Introduction to Doors and Windows - Residential</td>
<td>3</td>
</tr>
<tr>
<td>CPT 162 Introduction to Basic Interior Trim, Walls and Ceilings</td>
<td>4</td>
</tr>
<tr>
<td>CPT 161 Introduction to Staircases and Balconies</td>
<td>4</td>
</tr>
<tr>
<td>CPT 163 Introduction to Basic Floor Systems</td>
<td>3</td>
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<tr>
<td>TCS 100 Construction Blueprint Reading</td>
<td>3</td>
</tr>
<tr>
<td>ELT 100 Residential Wire</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total Credits Required: 26**
CNC Programming - Lathe and Mill, Certificate of Competency (CNC)

This certificate is designed to prepare the student for entry-level positions in the occupational specialty of manual programmer of CNC lathes and mills. The Certificate of Competency in CNC Programming - Lathe and Mill will be awarded upon successful completion of the minimum competencies as outlined below.

Upon successful completion of this program, students should be able to:

- Utilize CAM software programming options to modify cutting parameters and tooling documentation sheets, and job plans for a CNC mill (router on similar machine tool), and a CNC lathe.
- Apply principles of mathematics, engineering print interpretation and geometric analysis to describe part datum's, surfaces, and feature locations in terms of 2 and 2 1/2 axes machine tool positions.
- Prepare and proof a written manuscript for the production of parts on a CNC mill, (or similar machine) or a CNC lathe.
- Utilize mathematical calculations, and concepts of geometric relationships combined with techniques, hardware, software menus and computer system practices associated with a Computer Aided Machining/Distributed Numerical Control (CAM/DNC) system to manually write, save, retrieve and transfer CNC machine tool programs.
- Size conductors, receivers, reservoirs, and accumulators.
- Construct and demonstrate use of control devices, circuits and systems.
- Develop objectives and goals of a machining manufacturing project.
- Prepare schedules and allocate resources.

Students seeking to pursue this certificate program must meet the following prerequisites:
Mathematics for Occupational Technologies (MTT 108), or: Technical Mathematics (MAT 110), Prints, Layout, and Measurements for Machining (MTT 110), Introduction to Manufacturing (MTT 111), Lathe Operations 1 (MTT 112), Milling Operations 1 (MTT 124), Lathe Operations II (MTT 122), Milling Operations II (MTT 214), CNC Machine Tool Operations (MTT 210), Manufacturing Processes (MTT 213) and Technical Communications (TCC 111).

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MTT 210 CNCTool Operations</td>
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</tr>
<tr>
<td>MTT 220 CNC Programming</td>
<td>3</td>
</tr>
<tr>
<td>TME 229 Fluid Power and Controls</td>
<td>4</td>
</tr>
<tr>
<td>TCC 121 Project Management Processes</td>
<td>3</td>
</tr>
<tr>
<td>MTT 199 Co-op/Internship</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits Required: 16

Computer Aided Drafting Certificate of Competency (DDTC)

As we begin the twenty-first century, the design industry is looking for a new breed of workers. They must be computer-savvy self-starters who can speak and write well, dovetail effortlessly into various cross-functional teams, switch roles within a firm, or move across companies without a backward glance, and they must be fearless of the change spawned by emerging technology. In these courses, students will explore Architecture, Engineering and Construction (AEC) and other specialized fields as they develop computer-aided drafting skills. They will learn to manage computer systems for drawing production, information storage, retrieval and communication in the electronic world.

This program is intended, primarily, to serve as computer training for individuals who have previous experience as manual “board” drafters and who already possess a working knowledge of technical drawings. The program schedule is designed to be able to be completed in one academic year (including one summer class) attending 2 evenings per week. During the introductory summer class TDD 225, students with prior drafting experience should apply to the DCCC Assessment Center to have previous drafting experience evaluated for credit by portfolio assessment against the course TCC 112 Technical Graphics/CAD.

Upon successful completion of this program, students should be able to:

- Create two- and three-dimensional technical design models and drawings to document solutions for defined customer problems.
- Use CAD tools in applying the principles of descriptive geometry and the techniques of graphic construction to the process of documenting design intent.
- Execute computer generated plane and 3D geometric forms, as well as object viewing techniques, to describe and present a design concept.
- Apply CAD tools and techniques in the execution of working, multiview, assembly and 3D model drawings.

<table>
<thead>
<tr>
<th>Summer Semester</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>TDD 225 Computer Aided Drafting</td>
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<tr>
<td>Plus Portfolio Evaluation of prior drafting experience</td>
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</tr>
<tr>
<td>Or</td>
<td></td>
</tr>
<tr>
<td>*TCC 122 Technical Graphics-CADD</td>
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<table>
<thead>
<tr>
<th>Fall Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>*TCC 122 2-D CADD</td>
<td>3</td>
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<tr>
<td>TCC 121 Project Management Processes</td>
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</table>

<table>
<thead>
<tr>
<th>Spring Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>TDD 199 Co-op/Internship</td>
<td>3</td>
</tr>
<tr>
<td>TDD 216 Three-Dimensional CADD</td>
<td>3</td>
</tr>
<tr>
<td>TDD 227 Advanced CADD</td>
<td>3</td>
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</tbody>
</table>

Total Credits Required: 15

*Individuals with no prior drafting experience should begin the program sequence with TDD 225, students with prior drafting experience will require two additional semesters to complete the course schedule.

Computer Aided Machining Lathe, Mill and EDM, Certificate of Competency (CAM)

This certificate is designed to prepare the student for entry-level positions in the occupational specialty of Computer Aided Manufacturing/Machining in Lathe, Mill and EDM programming and operations. Concepts covered include CAM as a design, management and operational tool, principles of EDM technology, and production utilizing EDM equipment. Students will learn how to maximize efficiencies and effectiveness via software and equipment integration. Learning will be further developed and reinforced with the opportunity for work-based experience. The Certificate of Competency in Computer Aided Machining (CAM) Lathe, Mill and EDM will be awarded upon successful completion of the minimum competencies as outlined below.

Upon successful completion of this program, students should be able to:

- Interact with hardware/software in order to create and manipulate various views as a means for appropriately displaying a graphical/cam model.
- Plan and demonstrate steps for creating and modifying (manufactured) part models.
- Structure a plan for approaching multi-part, same set-up, tool path generation for difficult to machine piece-parts.
- Generate tool paths for creating cross drilling, face contouring, and c-axis contours on mill-turn machine tool.
- Set-up and operate a ram and a wire EDM machine tool in order to achieve desired inspection/quality characteristics on a finished part.
- Utilize CAM software programming options to modify cutting parameters and settings, as well as part geometry at various points on a contour.
• Students seeking to pursue this certificate program must meet the following prerequisites:
  Mathematics for Occupational Technologies (MTT 108), or; Technical Mathematics (MAT 110),
  Prints, Layout, and Measurements for Machining (MTT 110), Introduction to Manufacturing
  (MTT 111), Lathe Operations I (MTT 112), Milling Operations I (MTT 124), Lathe Operations II
  (MTT 122), Milling Operations II (MTT 214), Manufacturing Processes (MTT 213), Technical
  Communications (TCC 111), CNC Machine Tool Operations (MTT 210), CNC Programming
  and Advanced Operations (MTT 220), Fluid Power and Controls (TME 229), Project Management
  Processes (TCC 121).

Course | Credits
-------|--------
MTT 129 Solids (CAM) Modeling | 3
MTT 219 CAM Solids I | 3
MTT 229 CAM Solids II | 3
MTT 230 Electrical Discharge Machining | 4
MTT 199 Co-op/Internship | 2

Total Credits Required: 15

Electrical, Certificate of Competency (ELT)

The Electrical program is designed to train individuals in the safe, proper and efficient
installation of electrical equipment and associated wiring. This program stresses all of the
basic elements required in the types of installations most often encountered by the electrician.
The National Electrical Code, its interpretation and application are included in every facet of the
program. The curriculum has been approved by the U.S. Department of Labor, Bureau of
Apprenticeship and Training, for the 144 hours per year of classroom training
required in an electrical apprenticeship program.

Upon successful completion of this program, students should be able to:
• Demonstrate a knowledge of OSHA guidelines for the electrical profession.
• Explain the National Electrical Code.
• Interpret the Electrical Code in practical application.
• Perform calculations that are required of the electrician.
• Install conductors that are properly sized so as to avoid voltage drop and assure proper
  system operation.
• Interpret various wiring diagrams accurately.
• Install an electric service.
• Install transformers in various configurations.
• Lay out an electrical installation for residential and commercial uses.
• Utilize the various electrical meters and measuring devices used in the field.
• Install basic low-voltage and signal systems.

Course | Credits
-------|--------
ELT 100 Residential Writing I | 4
ELT 101 Residential Writing II | 4
ELT 102 Commercial Wire I | 4
ELT 152 Electrical Code | 2
ELT 199 Optional Co-op/Internship | 3
ELT 200 Commercial Wire II | 4
ELT 201 Industrial Electricity I | 4
ELT 202 Industrial Electricity II | 4

Total Credits Required: 26

Construction Supervision Certificate of Competency (CSUP)

The Construction Supervision program is designed for individuals with an
established background in the construction trades who are seeking
advancement to supervisory leadership positions. The core courses will
develop an appreciation of the importance of good communication skills,
human relations skills, and the fundamental challenges of achieving
organizational goals through the efforts of others. Emphasis is placed on
understanding the legal, contractual and organizational practices that form the
basis of an effective construction organization. The Construction Supervision
electives provide an additional component of focused activity relevant to the
student’s particular trade background and professional goals. Typical job titles
serviced by this curriculum include Construction Foreman, Construction Group
Leader and Site Superintendent.

Upon successful completion of this program, students should be able to:
• Manipulate technical information related to methods and materials of construction.
• Explain the functions of standard construction documents and procedures.
• Follow a standard protocol for the preparation of project data.
• Discuss characteristics of effective leadership in achieving results through the
  effort of others.
• Track time duration information for the completion of an activity.
• Explain the application of common laws and regulations pertaining to site
  activity.
• Define the elements of effective human relations on the job site.
• Identify the specific components of a site management system.
• Describe the critical elements of a job site safety program.
• Define construction closeout procedures.

First Semester | Credits
---------------|--------
TCC 111 Technical Communication | 3
TCS 100 Construction Specifications and Blueprint Reading | 3
TCS 108 Construction Supervision | 3
Construction Supervision Elective | 3
12

Second Semester | Credits
----------------|--------
TCS 109 Construction Project Administration | 3
MAT 110 Technical Math I | 4
TCS 141 Construction First Aid and Safety | 3
Construction Supervision Elective | 3
13

Total Credits Required: 25

Construction Supervision Electives

TCC 112 Technical Graphics –CADD | 3
Co-requisite: TCC 111 Technical Communications
TCC 121 Project Management Processes | 3
Prerequisite: TCC 111 Technical Communications
TCC 122 Two-Dimensional CADD | 3
Prerequisite: TCC 112-Technical Graphics CADD
TCS 111 Methods and Materials of Construction I | 3
Prerequisite: TCS 100 Construction Blueprints
TCS 112 Methods and Materials of Construction II | 3
Prerequisite: TCS 111 Methods and Materials I
TCS 131 Construction Estimating I | 3
Prerequisite: MAT 110 Technical Mathematics I,
TCS 100 Construction Blueprints
TCS 132 Estimating II | 3
Prerequisite: TCS 131 Estimating I
TCS 221 Construction Surveying and Layout | 3
Prerequisite: MAT 110 Technical Mathematics I
ARC 121 Architectural Graphics I | 3
Prerequisite: TCS 100 Construction Blueprints and TCC 112 Technical Graphics-CADD
ARC 226 Mechanical and Electrical Systems in Buildings | 3
Co-requisite: TCS 112 Methods and Materials I
TME 216 Statics and Strength of Materials | 3
Prerequisite: MAT 110 Technical Mathematics I
PHY 100 Technical Physics I | 3
Co-requisite: MAT 110 Technical Mathematics I
Electronic Commerce, Certificate of Competency (ECMC)

Electronic Commerce is the advertising, selling and buying of products and services—both retail to consumers, and wholesale, from business to business through the Internet. The certificate program in Electronic Commerce is intended for small business owners who want to engage in electronic commerce to develop and deploy e-business solutions. The emphasis in the program is on the development of sound business and computer skills to participate in the growing world of electronic commerce. The program teaches individuals how to build an attractive Web site, how to attract people to the Web site, what to do with customers once they are on the Web site and how to provide customer service through the Internet.

Upon successful completion of this program, students should be able to:

- Discuss electronic commerce principles and concepts.
- Identify terms used in electronic commerce and related technologies.
- Discuss the global impact of electronic commerce on business.
- Develop and maintain a Web page to market a product or service.
- Apply business principles to electronic commerce.
- Use computer software and applications to enhance business operations.
- Develop a supply chain strategy for a business operation.
- Discuss legal, political and ethical issues associated with an international business that engages in electronic commerce.
- Develop a marketing plan for a business engaged in electronic commerce.

Course Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS 102 Introduction to E-Commerce</td>
<td>3</td>
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<tr>
<td>BUS 234 Electronic Marketing</td>
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<tr>
<td>BUS 235 Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>IMM 100 Interface Design Using Director</td>
<td>3</td>
</tr>
<tr>
<td>IMM 120 Web Page Development</td>
<td>3</td>
</tr>
<tr>
<td>___199 Co-op/Internship or other BUS/DPR/IMM Elective</td>
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</table>

BUS/DPR/IMM Electives (Choose One)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BUS 100 Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>BUS 130 Business Communications</td>
<td>3</td>
</tr>
<tr>
<td>BUS 210 Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>BUS 230 Principles of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>BUS 231 Principles of Advertising</td>
<td>3</td>
</tr>
<tr>
<td>BUS 243 Legal Environment of Business</td>
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<tr>
<td>DPR 100 Introduction to Computers</td>
<td>3</td>
</tr>
<tr>
<td>DPR 105 Management Information Systems</td>
<td>3</td>
</tr>
<tr>
<td>DPR 113 Data Base Management Systems</td>
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<tr>
<td>IMM 110 Multimedia Graphics Design</td>
<td>3</td>
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<tr>
<td>IMM 122 Programming for the Web</td>
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</tbody>
</table>

Total Credits Required: 18

An Associate in Applied Science degree is also available. See page 37.

Emergency Medical Services Technology, Certificate of Competency (EMS)

The Emergency Medical Services Technology program prepares students to function as a well-rounded member of a pre-hospital team, as an Emergency Medical Technician. The responsibilities include medical, emotional and traumatic care of patients in a variety of accident and illness situations. Emphasis is placed on the safety and care of not only the patient, but also the provider and other members of the pre-hospital team, under extremes of physical, environmental and emotional stress.

Upon successful completion of this program, students should be able to:

- Assess and provide appropriate emergency care to victims suffering from a medical or traumatic event.
- Communicate patient care information in an effective, professional manner both verbal and written.
- Administer state-approved medications as permitted by protocols for Emergency Medical Technicians.
- Perform rapid patient assessment in life-threatening circumstances and make immediate decisions that will increase the chance of survival for a patient.
- Recognize hazardous materials and proper handling to minimize exposure.
- Define and be able to recognize the common intrinsic, traumatic and cumulative types of stresses associated with emergency service work.
- Define the methods and protocols of approach and intervention for a Critical Incident.
- Demonstrate ability to drive an emergency vehicle under emergency conditions and existing laws governing emergency vehicle operations.

Core Curriculum Credits

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EMS 100 EMT</td>
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<tr>
<td>HTM 101 Hazardous Materials Communication</td>
<td>3</td>
</tr>
<tr>
<td>EMS 200 Pre-Hospital Emergency Care</td>
<td>3</td>
</tr>
<tr>
<td>EMS 201 Pre-Hospital Trauma Life Support (PHTLS)</td>
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</tr>
<tr>
<td>EMS 105 Critical Incident Stress Management</td>
<td>2</td>
</tr>
<tr>
<td>EMS 107 Emergency Vehicle Operator Course</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credits Required: 17

Entrepreneurship – Certificate of Competency (BUSE)

The Certificate in Entrepreneurship was created to meet the needs of students who want to develop and run their own companies or engage in entrepreneurship management practices. Through courses such as Introduction to Entrepreneurship, Financial Planning Business Communications, and Law for the Entrepreneur, students gain insight into what skills are needed to become an Entrepreneur. The program is intended to integrate key requirements of any entrepreneurial effort. It requires a minimum of 22 credit hours and is comprised of seven courses.

The certificate program is designed to prepare students in both operational and skill aspects of the small enterprise. Such preparation will equip students with specific areas of skills or management to either enter an existing small firm or begin their own entrepreneurial enterprise.

Courses are designed so that the student, through logical steps, understands the principles unique to small business operation. Successful completion of 22 credits may lead to a certificate of competency in Entrepreneurship. Practical knowledge in small business management, finance, marketing, sales, advertising and supervision are designed to prepare students for entry-level needs. Generally, transfer is not intended through this program. The Dean, Business/Computer Information Systems, should be consulted when considering use of credits for transfer.

College-Sponsored Experiential Learning may be taken for credit while working in a small business with specific managerial duties.

Upon successful completion of this program, students should be able to:

- Write a Business Plan.
- Use terms and tactics within the small business environment.
- Be able to develop a marketing plan.
- Analyze and resolve problems involving finance.
- Understand personal qualities needed to function effectively with individuals in supervision, evaluation and control.
- Understand current legal issues involved in starting and operating a business.
- Develop effective communication to administer policy both internally and externally.
Health Unit Coordinator,
Certificate of Competency (AHU)

The Health Unit Coordinator certificate program prepares students to participate as members of the health team in performing clerical skills essential to the effective management of clinical units within health institutions and agencies. Applicants are required to have a high school diploma or equivalent.

All Health Unit Coordinator applicants are required to submit a “Criminal History Record Information Report” and “Child Abuse History Clearance”. Students who have been convicted of a felony or other prohibited offense may be unable to complete their studies because clinical agencies may not permit participation in clinical experiences.

All Health Unit Coordinator students will need to have on file in the Health Center the results of a complete physical examination including: laboratory tests, a complete blood count, serology and a 9-panel urine drug screen and TB testing prior to beginning the clinical component of the program. Additionally, students must have medical health insurance and be in compliance with recommendations for the Hepatitis B vaccine.

Certain manual dexterity and sensory skills that enable students to competently perform required technical skills are necessary for successful completion of the Health Unit Coordinator program. Health problems that can interfere with the applicant’s ability to demonstrate achievement of program competencies are considered individually.

In addition to the normal tuition and fees, Health Unit Coordinator students are required to purchase uniforms. Applicants are required to take college placement tests for English, reading, and math skills.

A student in the Health Unit Coordinator program may be removed from the program for behavior incompatible with occupational standards or violation of patient safety/privacy rules or for failure to participate in clinical assignments.

Upon successful completion of this program, students should be able to:

- Identify the functions of components in residential and light commercial HVAC&R equipment.
- State the techniques of installing equipment.
- Handle refrigerant and detail potential environment hazards of fluorocarbons.
- Cite the procedure of heat loss and heat gain load calculations.
- Diagnose trouble in operating safety controls.
- Perform specific start-up procedures to ensure operational efficiency and safety of HVAC&R equipment.

A certificate of competency will be awarded to all candidates completing the program of studies with a GPA of 2.0 and a “C” or better in the allied health course and have successfully completed all required courses.

Total Credits Required: 22

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BUS 105</td>
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<td>BUS 106</td>
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<td>BUS 130</td>
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<td>BUS 211</td>
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<td>BUS 230</td>
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<td>BUS 233</td>
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<td>BUS 243</td>
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<td>AHU 100</td>
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<td>AHM 233</td>
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<td>DPR 100</td>
<td>3</td>
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<td>AHM 100</td>
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<td>AHM 130</td>
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<tr>
<td>AHU 100</td>
<td>6</td>
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</tbody>
</table>

Total Credits Required: 21

Human Resource Management,
Certificate of Competency (CHRM)

According to the 21st Century Report published by Columbia University, human resource management is the second most important indispensable component of corporate performance and competitive advantage today. (The first is strategic planning in which human resource management plays a vital role.) Today’s rapidly changing business environment is forcing organizations to face many challenges such as workforce diversity, downsizing, shortages of skilled workers in the service industry, and the evolving roles of work and families. The ability to manage people and processes is essential for successful careers in all levels and types of organizations. Organizations realize that to be successful in today’s complex business environment, they must have productive, motivated people. This program provides students with the theories, principles and skills necessary to find, develop and motivate today’s excellent workforce.

This program is designed for those individuals interested in careers in management as well as those currently working in the field of human resource management. It is also designed for those individuals interested in people relations and general management. The focus of the program will be on developing a thorough understanding of the human resource processes of training, employee relations, staffing, and compensation and benefits.

Upon successful completion of this program, students should be able to:

- Identify the techniques of installing equipment.
- State the techniques of installing equipment.
- Handle refrigerant and detail potential environment hazards of fluorocarbons.
- Cite the procedure of heat loss and heat gain load calculations.
- Diagnose trouble in operating safety controls.
- Perform specific start-up procedures to ensure operational efficiency and safety of HVAC&R equipment.
• Demonstrate knowledge and skills in the functional areas of management and leadership including planning, organizing, controlling, problems solving and motivation.

• Demonstrate knowledge and skills in the specialized areas of human resource management including staffing, performance management, employee relations and commitment, compensation and employee development.

• Develop a personal leadership style based on situational, individual and organizational characteristics.

• Develop and implement human resource policies and practices concerning staffing, performance management, employee relations and commitment, compensation and employee development.

• Develop and implement organization change programs and policies.

• Explain and apply organizational behavior and management theories as the basis for effective management practice and policies.

• Develop career objectives and plans in the fields of general management and human resource management.

Upon successful completion of this program, students should be able to:

• Design and implement human resource policies and practices concerning staffing, performance management, employee relations and commitment, compensation and employee development.

• Develop and implement organization change programs and policies.

• Explain and apply organizational behavior and management theories as the basis for effective management practice and policies.

• Develop career objectives and plans in the fields of general management and human resource management.

Industrial Systems Technology, Certificate of Competency (IST)

This certificate is designed to prepare students for entry-level employment as Industrial Systems Technicians with a specialty in areas related to manufacturing and industrial processing industry. Knowledge and skills instruction in this program will deal with various levels of industrial systems equipment where the students will learn how to maintain equipment and to maximize equipment efficiencies and effectiveness. The electro/mechanical knowledge gained will provide students with a background in equipment operation as well as an understanding of systems integration. Theoretical topics will be reinforced with laboratory experiences via laboratory experiments and assignments. The Certificate of Competency in industrial Systems Technology will be awarded upon successful completion of the minimum competencies as outlined below.

Upon successful completion of this program, students should be able to:

• Demonstrate the principles of technical information management and communication.

• Perform the basic mathematical computational skills required of a technician.

• Apply the theory and practices associated with basic electrical circuit installation and troubleshooting.

• Apply the theory of precision measuring and measurement to the solution of typical workplace problems.

• Cite the purpose and classify by type, various pieces of power transmission and mechanical motion equipment.

• Determine specifications associated with equipment parts, installation, repair and replacement.

• Specify and install bearings, belts, chains, gears, coupling, drives, etc.

• Select and apply gaskets, seals, sealants, lubrications and oils.

• Plan, prepare and schedule an activity list associated with job descriptions that will also include safety procedures and all aspects of accident prevention, health and environmental issues.

• Interpret drawings and schematics; properly use hand and power tools and basic electrical instruments while performing industrial equipment maintenance and repair.

Total Credits Required: 18

Interactive Multimedia, Certificate of Competency (IMMC)

The certificate program in Interactive Multimedia trains students in the development of World Wide Web (WWW) pages and Computer-Based Training (CBT) applications that employ a variety of audio and visual media including animation, video and graphics.

Upon successful completion of this program, students should be able to:

• Complete all phases of the multimedia design and development process including instructional design, storyboarding, interface design, media selection, digitizing and evaluation.

• Identify and employ effective features of CBT and WBT.

• Use current software applications to create digital sound, video and animation for inclusion in multimedia programs.

• Create interactive multimedia programs using sophisticated authoring development tools.

Total Credits Required: 16

Machining Operations – Level I, Certificate of Competency (MTC1)

This certificate is designed to prepare the student for entry-level positions in manufacturing environments utilizing conventional machining equipment.

Concepts covered include mathematical applications in machining, drawings as a communication tool, and exposure to a variety of equipment used in manufacturing. Program completers will be prepared to seek positions as entry-level inspectors, or lathe, milling, drilling, or grinding machine operators/machinists.

Upon successful completion of this program, students should be able to:

• Perform English and Metric computations involving numeric and literal problems.

• Discuss the purpose, the importance, the types, and various uses of engineering drawings, as they relate to the design and manufacture of parts.

• Communicate the purpose of a title sheet, and relate the value of each of its components to the process of completing a finished product. Elaborate on the reading of operational notes and annotations on a drawing using trade terminology.

• Compare and contrast hardness and machinability ratings.

• Demonstrate procedures for set-up and operation of various sawing, drilling, offhand, and surface grinding machines.

• Set-up and operate a conventional engine lathe to complete intermediate to advanced operations involving trepanning, tool post grinding, radius-turning devices, threading (tap/die) heads, steady, and follower rests.

• Select accessories and attachments, set-up and use face plates, independent,
universal, and combination chucks, collect attachments, and a steady rest to facilitate internal surface feature creation such as radii, bores (straight, and tapered), grooves, and chased threads on a lathe.

• Perform machine head/table and workholding device alignments.
• Calculate and set speeds and feeds, and perform drilling, milling, grinding and other machine operations.

Course Number | Credits
--- | ---
MTT 108 | 3
MTT 110 | 4
MTT 111 | 3
MTT 112 | 3
MTT 124 | 3
MTT 199 | 3

Total Credits Required: 16

Machining Operations - Level II, Certificate of Competency (MTC2)

This certificate is designed to prepare the student for above entry-level positions in the occupational specialty of conventional and Computer Numerical Control lathe and milling machine operations.

Upon successful completion of this program, students should be able to:

• Determine coolant selection, speed, and feed settings in regard to tool material and insert geometry requirements in order to obtain specific surface finish requirements on milled parts.
• Create internal features to include chamfers, bores, recesses, counterbores, countersinks, grooves and pockets using a milling machine.
• Set-up and use various style cutters to create form (profile) geometry.
• Perform geometric/algebraic/trigonometric calculations for setting-up machining, and inspection of parts, to include chamfers, tapers, threads, etc.
• Review reference materials and develop a process plan, to include job/operations, tooling, and inspection procedures a review of reference materials in order to perform machining of a basic lathe piece-part.
• Distinguish between the common surface treatments and finishing processes.
• Relate the classifications of production systems and the impact automation has for each.
• Elaborate on the principles of Lean Production and the “Factory within a Department” concepts, suggesting their possible impact on the social fabric of the workplace.
• Summarize the concepts and criteria for reducing costs and increasing productivity on the shop floor.
• Utilize welding, melting, casting, and molding equipment.
• Demonstrate appropriate terminology, mechanics, usage, and style while communicating technical information.
• Develop computer integrated graphical documents to prepare technical correspondence and presentations.
• Students seeking to pursue this certificate program must meet the following prerequisites:
  Mathematics for Occupational Technologies (MTT 108), or; Technical Mathematics (MAT 110). Prints, Layout, and Measurement for Machining (MTT 111), Lathe Operations I (MTT 112), and Milling Operations I (MTT 124).

Course Number | Credits
--- | ---
MTT 122 | 3
MTT 199 | 3
MTT 214 | 3
MTT 210 | 3
MTT 213 | 3
TCC 111 | 3

Total Credits Required: 15

Managed Care, Certificate of Competency (AHMC)

Changes in the health care marketplace with the shift to managed care has created new roles and job opportunities for health care professionals. The Managed Care Certificate program provides students with a comprehensive study of the principles and tools of managed care, with an emphasis on reducing costs, improving outcomes and demonstrating quality in today’s dynamic but constrained health care environment. The role of the case manager is explored, as well as other new job opportunities that have emerged. Additionally, this program helps students become personally accountable for their career planning.

Upon successful completion of this program, students should be able to:

• Describe principles, terminology, structure and products of health care management.
• Describe emerging health-care delivery systems and their impact on delivery, financing, practice patterns and the utilization of personnel and services.
• Explain the priorities of managing risk, quality improvement and measuring outcomes.
• Assess issues and trends in health-care management.
• Develop skills for coordination of care and services in managed care settings.
• Analyze the health care delivery system as a multidisciplinary, multifaceted entity with a variety of entry and access points along a continuum of care.

Course Number | Credits
--- | ---
AHA 209 | 3
AHA 210 | 3
AHA 206 | 3
AHA 217 | 3
AHA 213 | 3

Total Credits Required: 15

A Certificate of Competency in Managed Care will be awarded at the completion of the required 15 credits with a grade of “C” or better in all courses. Enrollment is limited to students with a background and/or experience in health care.

An Associate in Applied Science degree in Health Care Management is also available. See page 41.

Manufacturing Operations, Certificate of Proficiency (MAN)

This certificate will provide the student with the necessary skills to seek employment as advanced conventional machine tool operators/machinists in the manufacturing field of Precision Machining. Specific general education courses must be selected in order to be appropriately prepared to secure this certificate. Selected courses will aid in preparing the student to meet a more demanding work assignment. The program is intended for students who seek above entry-level positions.

Upon successful completion of this program, students should be able to:

• Analyze the features of an object and develop a representative sketch using the principles of orthographic projection.
• Interpret line work, dimensions, orthographic views, various section types, auxiliary views, and annotations associated with mechanical drawings.
• Apply appropriate terminology in order to, select, handle, care for, and store tools used to perform bench work, inspection and assembly operations.
• Perform commonly assigned operator clean up and maintenance tasks associated with grinding, sawing and drilling machines.
• Utilize detail drawings, calculations, layout tools, precision measuring instruments and appropriate techniques to prepare parts for manufacture on a lathe and mill and verify part dimensions during inspection procedures.
Additionally, students must have medical health insurance and be in pre-entrance medical record health form requirements from the Health Center prior to beginning the clinical component of the program. Please refer to the complete blood count, serology, a 9-panel urine drug screen, and TB testing considered individually.

Health problems that can interfere with the applicant’s ability to meet program competencies are completion of the Medical Assistant program. Health problems that can competently perform required technical skills are necessary for successful registering for Medical Assistant Techniques and Practicum I (AHM 106).

Medical assistant applicants are required to take college placement tests in English, Mathematics, and Reading. The required program with a 2.0 GPA and a “C” or better in all allied health courses. The graduate is then eligible to write the examination for national certification administered through the American Association of Medical Assistants.

In addition to the normal tuition and fees, medical assistant students are required to purchase uniforms and miscellaneous supplies.

Medical Assistant, Certificate of Proficiency (CMED)

The Medical Assistant program prepares students as multi-skilled health care workers who function as assistants to physicians in a variety of ambulatory care settings. The responsibilities of the medical assistant include administrative and clinical duties. The Delaware County Community College Medical Assisting program is accredited by the “Commission on Accreditation of Allied Health Education Programs” on the recommendation of the Curriculum Review Board of The American Association of Medical Assistants Endowment (AAMAE).

All medical assistant applicants are required to submit a “Criminal History Record Information Report” and be free of any conviction of elder or child abuse for 10 years prior to beginning the first clinical course. Selected clinical externships will be provided in local medical offices and health care clinics under the supervision of the allied health faculty. These externships are work/learning experiences for which the student receives no monetary remuneration or other reimbursement.

Medical assistant applicants are required to take college placement tests in math, reading, and English. Any deficiencies must be remedied prior to registering for Medical Assistant Techniques and Practicum I (AHM 106). Certain manual dexterity and sensory abilities that will enable the student to competently perform required technical skills are necessary for successful completion of the Medical Assistant program. Health problems that can interfere with the applicant’s ability to meet program competencies are considered individually.

All medical assistant students will need to have on file in the Health Center the results of a complete physical examination including: laboratory tests, a complete blood count, serology, a 9-panel urine drug screen, and TB testing prior to beginning the clinical component of the program. Please refer to the pre-entrance medical record health form requirements from the Health Center. Additionally, students must have medical health insurance and be in compliance with recommendations for the Hepatitis B vaccine. Full CPR certification is required. You must submit a photocopy (both sides) of “Health Care Provider” (American Heart Association) which is renewable every two years or “Course for the Professional” (American Red Cross) which is renewable annually. Documentation of completion of the above must be on file in the Health Center prior to entering the Medical Assistant Externship (AHM 199).

Students may be removed from the program for violation of patient safety, confidentiality, or behavior incompatible with acceptable standards pending outcome of the appeal process.

Upon successful completion of this program, students should be able to:

- Demonstrate an understanding of the anatomical structure and physiological functioning of the human body and of medical terms descriptive of body systems.
- Identify the business/administrative and clinical duties of the medical assistant.
- Describe the ethical and legal responsibilities of the medical assistant in the health-care delivery system.
- Apply selected principles of biophysical and psychosocial sciences in providing assistance to the physician.
- Maintain business and patient health records.
- Function as an assistant to the physician in medical and/or other clinical settings.
- A Certificate of Proficiency will be awarded upon successful completion of the required program with a 2.0 GPA and a “C” or better in all allied health courses.

In addition to the normal tuition and fees, medical assistant students are required to purchase uniforms and miscellaneous supplies.

Medical Coding for the Health Care Professional, Certificate of Competency (MCH)

The Certificate of Competency in Medical Coding for the Health Care professional is designed to meet the needs of current licensed or certified Health Care Professionals (nurses, respiratory therapists, medical assistants) or graduates of the Health Studies Associate in Applied Science Degree program who are interested in becoming Professional Medical Coders or expanding their current job responsibilities to include medical coding.

This program provides students with the skills necessary to function as Physician-Based Coders, Hospital Coders, or Medical Claims Reviewers. Today, there are many demands for coding specialists and accurately coded data from the medical
record in all types of health care institutions. Coded data are used on claims for reimbursement, patient care management, and healthcare evaluation and research. The curriculum includes medical terminology, human anatomy, computer skills and CPT and ICD coding. The graduate may sit for the Certified Professional Coder (CPC) or Certified Professional Coder-Hospital (CPC-H) examinations offered by the American Academy of Professional Coders.

A Certificate of Competency in Medical Coding for the Health Care Professional (MCH) will be awarded upon completion of this curriculum with a 2.0 GPA and a "C" or better in all allied health (AH) courses.

Upon successful completion of this program, students should be able to:

• Demonstrate an understanding of the anatomical structure and physiological functioning of the human body and of medical terms descriptive of body systems.
• Describe the ethical and legal concepts of concern to reimbursement in health care.
• Apply appropriate coding systems as they pertain to the identification of diseases and procedures in medical practices and hospital settings.
• Evaluate coding procedures for achievement of optimal quality in seeking appropriate reimbursement.
• Demonstrate ability to interact successfully with all significant private and governmental medical reimbursement systems.

Course Credits
AHM 199 Optional Co-op/Internship ........................................ 3
AHM 230 Introduction to ICD-9-CM Coding Principles ............... 3
AHM 231 Introduction to CPT-4 Coding .................................... 3
AHM 240 Advanced ICD-9-CM Coding ................................... 3
AHM 232 Advanced CPT-4 Coding .......................................... 3

Total Credits Required: 12

Medical Coding, Certificate of Proficiency (MC)
The Medical Coding Certificate program provides students with the skills necessary to function as Physician-Based Coders, Hospital Coders, or Medical Claims Reviewers. Today, there are many demands for coding specialists and accurately coded data from the medical record in all types of health care institutions. Coded data are used on claims for reimbursement, patient care management, and healthcare evaluation and research. The curriculum includes medical terminology, human anatomy, computer skills and CPT and ICD coding. The graduate may sit for the Certified Professional Coder (CPC) or Certified Professional Coder-Hospital (CPC-H) examinations offered by the American Academy of Professional Coders.

A Certificate of Proficiency in Medical Coding will be awarded upon completion of this curriculum with a 2.0 GPA and a "C" or better in all allied health (AH) courses.

Upon successful completion of this program, students should be able to:

• Demonstrate an understanding of the anatomical structure and physiological functioning of the human body and of medical terms descriptive of body systems.
• Describe the ethical and legal concepts of concern to reimbursement in health care.
• Apply appropriate coding systems as they pertain to the identification of diseases and procedures in medical practices and hospital settings.
• Evaluate coding procedures for achievement of optimal quality in seeking appropriate reimbursement.
• Demonstrate ability to interact successfully with all significant private and governmental medical reimbursement systems.

First Semester Credits
ENG 100 English Composition I .............................................. 3
AHM 233 Medical Terminology .............................................. 3
AHM 104 Body Structure/Function I ....................................... 3
AHM 105 Body Structure/Function II ...................................... 3
DPR 100 Introduction to Computers ....................................... 3

Second Semester Credits
AHM 230 Introduction to ICD-9-CM Coding Principles ............... 3
AHM 231 Introduction to CPT-4 Coding .................................... 3
AHM 108 Conditions of Illness ............................................. 3
AHM 240 Advanced ICD-9-CM Coding ................................... 3

Total Credits Required: 12

Municipal Police Academy, Certificate of Competency (MPT)
All students successfully completing this certificate will earn thirty-six (36) credits, an ACT 120 certificate and be eligible to begin work as a Municipal Police Officer.

Upon successful completion of this program, students should be able to:

• Apply principles of police discretionary conduct.
• Describe the role of personal and professional conduct.
• Depict police leadership traits and techniques.
• Analyze psychological barriers to confrontation by police of their own emotional and psychological problems.
• Analyze the U.S. and Pennsylvania Constitution provisions that provide the legal basis for the exercise of police power.
• Recognize provisions of Pennsylvania statutes that define criminal conduct.
• Cite provisions of the Mental Health Act, Protection from Abuse Act, Liquor Control Act and Crime Victims Compensation Act.
• Identify major provisions of the Controlled Substance Act pertinent to their enforcement capacity.
• Apply appropriate provisions of the Motor Vehicle Code to specific factual situations.
• Define reportable and non-reportable, traffic and non-traffic motor vehicle collisions.
• Apply standard accepted principles of police patrol.
• Delineate Miranda-warnig requirements.
• Define a preliminary investigation.
• Apply principles of preliminary, crime site and follow-up investigation.
• Apply principles of interview and interrogation.
• Differentiate criminal investigation from civil investigation.
• Identify the impact of role awareness, reference groups and motivation of human behavior.
• Describe Constitutional and other legal requirements for arresting an individual or taking the individual into custody.
• Demonstrate procedures required for arrest of individuals and for searches of those taken into custody.
• Delineate unique problems involved in the detention of mentally ill, emotionally unstable and physically handicapped individuals.
• Illustrate proper procedures for use of pistols, shotguns and hollyers.
• Operate police vehicles under normal and emergency circumstances.
• Describe the officer’s responsibilities for civil and/or criminal penalty in case of police vehicle accident.
• Illustrate written reports and note-taking skills.
• Apply principles of emergency medical care to crisis situations.
• List emergency medical problems confronted by police officers.
• Describe various violent and dangerous situations, more particularly those involving domestic disputes, mentally ill individuals and violent criminals.
• Identify proper procedure to handcuff suspects or prisoners.
Paralegal Studies, Certificate of Proficiency (CPLG)

This program is approved by the American Bar Association (ABA). The certificate in Paralegal Studies is intended to educate a generalist paralegal. Graduates are likely to find employment working under the direction of an attorney (to do otherwise would be practicing law without a license) in law firms, legal departments of large corporations, insurance companies, title companies, legal service companies, and/or federal, state or local governmental agencies. In short, wherever lawyers are employed, paralegals are likely to be employed as well.

The certificate of proficiency program in Paralegal Studies may be completed only by an individual who holds an associate or bachelor's degree with at least 21 earned credits in approved General Education courses.

Upon successful completion of this program, students should be able to:

- Conduct legal research to identify the appropriate laws, judicial decisions, regulations and other legal literature applicable to specific legal problems.
- Research and draft written memoranda as directed by an attorney.
- Research and draft pleadings and other legal documents as directed by an attorney.
- Investigate and develop the facts of a case under the direction of an attorney.
- Assist in the preparation of a case for trial and assist during trial.
- Maintain all relevant case documents.
- Maintain files of a case including but not limited to correspondence, pleadings, reports and briefs.
- Draft basic documents applicable to contracts, real estate transactions, domestic relations, and estates, trust and wills as well as other appropriate legal documents.
- Apply modern technology to the performance of legal work and tasks.
- Discuss the ethical issues that arise for the Paralegal Professional.

See Electives Listings, Page 70.

Total Credits Required: 36

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPT 100 Introduction to Law Enforcement</td>
<td>2</td>
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<tr>
<td>MPT 101 Professional Development</td>
<td>4</td>
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<tr>
<td>MPT 102 Law and Procedures I</td>
<td>3</td>
</tr>
<tr>
<td>MPT 104 Motor Vehicle Law Enforcement</td>
<td>2</td>
</tr>
<tr>
<td>MPT 106 Patrol Procedures and Operations</td>
<td>3</td>
</tr>
<tr>
<td>MPT 107 Principles of Criminal Investigation</td>
<td>3</td>
</tr>
<tr>
<td>MPT 204 Firearms</td>
<td>3</td>
</tr>
<tr>
<td>MPT 207 Emergency Response Training</td>
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Total 23 Credits

Second Semester

<table>
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<td>MPT 105 Motor Vehicle Collision Investigation and Related Issues</td>
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<tr>
<td>MPT 103 Law and Procedures II</td>
<td>3</td>
</tr>
<tr>
<td>MPT 200 Human Relations</td>
<td>2</td>
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<tr>
<td>MPT 202 Crisis Management</td>
<td>2</td>
</tr>
<tr>
<td>MPT 205 Operation of Patrol Vehicles</td>
<td>2</td>
</tr>
<tr>
<td>MPT 206 Report Writing/CASE Preparation</td>
<td>2</td>
</tr>
<tr>
<td>MPT 208 Handling Arrested Persons</td>
<td>1</td>
</tr>
</tbody>
</table>

Total 13 Credits

Total Credits Required: 36

Photography, Certificate of Competency (PHOT)

This Certificate of Competency is designed to give students the knowledge to handle the science, craft and artistic merit of photography. The courses offered in this program provide a platform to bridge the technological gap between traditional and rapidly changing digital methods. Students will be exposed to a variety of tools and techniques that employ the use of photographic films, paper, chemicals, and computer applications in photography.

Upon successful completion of this program, students should be able to:

- Calculate, process and print exposures correctly.
- Pre-visualize subject matter for black and white photographs and determine film speed.
- Prepare and use toners safely.

See Electives Listings, Page 70.

Total Credits Required: 15

Photography, Certificate of Competency (PHOT)

This Certificate of Competency is designed to give students the knowledge to handle the science, craft and artistic merit of photography. The courses offered in this program provide a platform to bridge the technological gap between traditional and rapidly changing digital methods. Students will be exposed to a variety of tools and techniques that employ the use of photographic films, paper, chemicals, and computer applications in photography.

Upon successful completion of this program, students should be able to:

- Calculate, process and print exposures correctly.
- Pre-visualize subject matter for black and white photographs and determine film speed.
- Prepare and use toners safely.
• Apply large format camera work to studio subject matter by arranging and lighting objects to render perspective and depth of field correctly.
• Integrate knowledge of conventional analog into digital photography techniques.
• Produce a portfolio of black and white or color photographs, which will incorporate analog and digital techniques.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ART 160</td>
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<tr>
<td>ART 161</td>
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<td>ART 162</td>
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<tr>
<td>ART 169</td>
<td>3</td>
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<tr>
<td>ART 175</td>
<td>3</td>
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</table>

Total Credits Required: 15

**Plumbing Apprenticeship, Certificate of Competency (PLB)**

The Plumbing Apprenticeship program is a four-year curriculum that provides essential skills needed in today's plumbing occupations. The coursework covers a diverse range of skills and knowledge and helps develop maturity and independence of judgment. This apprenticeship training provides practical and theoretical aspects of the work required in this highly skilled occupation. This program is designed to be completed on a part-time basis only.

Upon successful completion of this program, students should be able to:
- Pass journey-level licensing examinations.
- Demonstrate proper safety practices.
- Lay out and install supply, drainage and heat piping systems.
- Specify and install various fixtures.
- Cite various requirements of the National Plumbing Code.
- Identify by sight supply and drainage materials and fittings.
- Read construction blueprints and specifications.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PLB 100</td>
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<td>PLB 101</td>
<td>5</td>
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<tr>
<td>PLB 102</td>
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<tr>
<td>PLB 103</td>
<td>5</td>
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<tr>
<td>PLB 104</td>
<td>1</td>
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<tr>
<td>PLB 200</td>
<td>2</td>
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<tr>
<td>PLB 201</td>
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<td>PLB 207</td>
<td>3</td>
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<tr>
<td>PLB 208</td>
<td>3</td>
</tr>
<tr>
<td>PLB 209</td>
<td>5</td>
</tr>
</tbody>
</table>

Total Credits Required: 37

**Process Technology I, Certificate of Competency (PCT)**

This certificate is designed to prepare students for entry-level positions as Process Operators within the various (continuous flow) Processing Industry fields. Continuous-flow Process Operators are employed in industries such as petroleum refining, petrochemical, chemical, and pharmaceutical manufacturing, as well food products processing industries. The program provides students with an introduction to the concepts, theory, principles, and technical demands, as well as the hazards, and accident prevention aspects associated with the operation of processing equipment.

Upon successful completion of this program, students should be able to:
- Describe, in general terms, the job responsibilities of various positions of employment within the (continuous flow) Processing Industry.
- Utilize a computer to retrieve/prepare/compile operator specific documentation.
- Discuss and apply safety, health, and environmental regulations in the context of an operator.
- Apply an understanding of chemistry (at an operator performance requirement level).
- Cite the operational characteristics of various pieces of processing equipment.
- Interpret processing schedules, operating logs, and test results to determine operating parameters for assigned equipment.
- Analyze specifications, monitor, and adjust controls to meet product requirements.
- Determine equipment malfunction/change-out requirements.
- Align (bring on line), observe/inspect, and set proper operating conditions for assigned production unit equipment.
- Perform operator assigned maintenance activities.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCT 101</td>
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<tr>
<td>PCT 100</td>
<td>3</td>
</tr>
<tr>
<td>PCT 110</td>
<td>3</td>
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<tr>
<td>TCC 111</td>
<td>3</td>
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<tr>
<td>MAT 110</td>
<td>4</td>
</tr>
<tr>
<td>CHE 105</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits Required: 20

**Process Technology II, Certificate of Proficiency (PCTP)**

This certificate is designed to provide students with the necessary skills and knowledge to seek above entry-level positions of employment as Process Operators/Technicians within the various Processing Industry fields. Process Operators/Technicians are employed within industries where refining, compounding, and mixing operations are commonly performed as part of a continuous-flow, semi-automated, or automated production method. Continuous-flow production industries include: petroleum refining, petrochemical, as well as chemical manufacturing, and commercial distribution. Other related processing/manufacturing industries, such as pharmaceutical and food production industries are also considered as continuous-flow industries. The program is designed to provide the student with appropriate skills and knowledge required to assure proper operational aspects of processing units which are designed to refine, formulate, blend, mix, treat, transfer, and/or hold liquid, gaseous, and solid products.

Upon successful completion of this program, students should be able to:
- Classify various production units within a processing plant, and describe their operating parameters.
- Discuss the principles of operation for the major pieces of equipment designed to support various units within a plant/facility.
- Determine the process flow, processing systems, auxiliary, and utility systems for a particular production process.
- Interpret the operation of a process control system, given appropriate supporting documentation.
- Cite relevant applications of environmental, safety, and health, and accident prevention rules, regulations, policies and procedures required for appropriate equipment, as well as unit/plant operation.
- Perform general maintenance, operating and monitoring duties associated with the commissioning, normal start-up/shutdown, operation, turn-around, and replacement of equipment and various plant units.
- Assist in determining and conducting (abnormal) Emergency Shut Down (ESD) incident response and abatement procedures.
- Develop and use documentation, such as Process Flow Diagrams (PFDs) and Piping and Instrumentation Diagrams (P&IDs) as tools for checklist development and troubleshooting.
• Demonstrate effective communication skills in order to develop, request, convey, and issue instructions in a clear, concise, and accurate manner.
• Utilize customer-client relationships, data-collection and analysis, and other quality improvement techniques to enhance personal job performance.
• Incorporate mathematical and scientific reasoning when solving problems.

Students pursuing this certificate program must meet the following prerequisites:
Introduction to Process Technology (PCT 101), Plant Equipment (PCT 100), Safety, Health and the Environment (PCT 110), Introduction to Computers (DPR 100), Technical Mathematics I (MAT 110) and Introduction to Chemistry (CHE 106).

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>ENG 100 English Composition I</td>
<td>3</td>
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<tr>
<td>MAT 111 Technical Mathematics II</td>
<td>4</td>
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<tr>
<td>PHY 100 Technical Physics I</td>
<td>3</td>
</tr>
<tr>
<td>PCT 111 Process Technology I</td>
<td>4</td>
</tr>
<tr>
<td>BUS 214 Organizational Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits Required: 17

Radiotherapy, Certificate of Proficiency (RAD)

The Radiotherapy program is designed to provide a curriculum where students, committed to the value of caring, can develop competencies essential for safe, effective radiotherapy practice in a variety of health care settings within the community. Radiotherapy is a sub-specialty of Radiologic Technology. In Radiologic Technology, patients receive diagnostic tests from Radiologic Technologists such as X-rays, Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET) scans that aid physicians in the diagnosis of an ailment. Radiation Therapy is a therapeutic modality. Patients come to radiation therapy facilities with a diagnosis of cancer, and Radiation therapists are the trained professionals who deliver their radiation treatment. The Radiation Therapy curriculum prepares students for positions as entry-level radiation therapy practitioners in a variety of settings; i.e. academic, free standing centers, and community-based hospitals. Upon successful completion of this curriculum, students receive a certificate of proficiency and are eligible to sit for the American Registry of Radiologic Technologists (ARRT) certification exam.

Selected clinical learning experiences, under the direct guidance of a clinical supervisor, are provided primarily at Crozer Keystone Health facilities. The purpose of these experiences is to provide the student with the opportunity to apply classroom learning in direct patient-care situations.

Upon successful completion of this program, students should be able to:
• Be clinically and academically competent to enter the workforce as entry-level radiation therapists.
• Critically think and problem solve as a radiation therapist.
• Communicate effectively with patients while demonstrating empathy and compassion.
• Practice lifelong learning.
• Function as entry-level radiation therapists.
• Meet all the requirements for a Certificate of Proficiency in Radiation Therapy from Delaware County Community College.

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<thead>
<tr>
<th>Spring Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>RAD 100 Introduction to Radiation Therapy</td>
<td>2</td>
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<tr>
<td>RAD 105 Clinical Education I</td>
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<tr>
<td>RAD 110 Radiation Therapy Techniques and Applications</td>
<td>4</td>
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<tr>
<td>RAD 115 Oncologic Patient Care and Ethical/Legal Issues</td>
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<tr>
<td>MAT 100 Intermediate Algebra</td>
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<th>Summer Semester</th>
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<td>RAD 150 Clinical Education II</td>
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<td>RAD 200 Clinical Education III</td>
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<td>RAD 120 Pathology</td>
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<tr>
<td>RAD 125 Radiobiology and Safety</td>
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<tr>
<td>RAD 130 Radiation Therapy Physics</td>
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<td>RAD 220 Seminar I</td>
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<td>ENG 100 English Composition I</td>
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<td>RAD 200 Clinical Education IV</td>
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<td>RAD 135 Quality Management in Radiation Therapy</td>
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<tr>
<td>RAD 140 Radiation Therapy Treatment Planning</td>
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<tr>
<td>RAD 145 Oncologic Pathology</td>
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<tr>
<td>RAD 230 Seminar II</td>
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Total Credits Required: 46

Small Business Management Certificate of Proficiency (CSBM)

The Small Business Management program is designed to prepare students in both operational and skill aspects of the small enterprise. Such preparation will equip students with specific areas of skills or management to either enter an existing small firm or begin their own entrepreneurial enterprise.

Courses are designed so that the student, through logical steps, understands the principles unique to small business operation. Successful completion of 30 credits may lead to a certificate of proficiency in small business. Practical knowledge in small business management, finance, marketing, sales, advertising and supervision are designed to prepare students for entry-level needs. Generally, transfer is not intended through this program. The associate degree, business/computer information systems, should be consulted when considering use of credits for transfer.

College-Sponsored Experiential Learning may be taken for credit while working in a small business with specific managerial duties.

Upon successful completion of this program, students should be able to:
• Use terms and tactic within the small business environment.
• Be able to develop a marketing plan.
• Analyze and resolve problems involving financial statement comparisons.
• Create advertising promotions appropriate to the small business.
• Demonstrate the skills necessary to operate office equipment commonly used in the small company.
• Show proficiency in microcomputer applications within the management and operating needs of the small business environment.
• Understand personal qualities needed to function effectively with individuals in supervision, evaluation and control.
• Develop effective communication to administer policy both internally and externally.

See Electives Listing, Page 70.
• Develop leadership skills to enhance the student's ability to effectively manage early childhood programs.
• Understand and apply the fundamentals of networking including the OSI model, network protocols, transmission media, topologies, hardware, software, WANs, remote connectivity, security, and TCP/IP.
• Install, use, manage and customize the UNIX operating system.
• Develop strategies for fostering children's cognitive, physical, social, emotional and language development.
• Describe the structure and practices of early childhood education.
• Demonstrate knowledge and understanding of the importance of working with parents as partners.
• Create and use web scripting technologies to process and analyze web data.

The Early Childhood Director, Certificate of Competency (ECD)

The Early Childhood Director Certificate of Competency from Delaware County Community College will prepare students for administrative and leadership positions in early care and education programs. Coursework will cover strategies for program administration, understanding of financial management and current issues facing early care and education programs. This certificate of competency also meets the educational requirements for Pennsylvania’s Director Credential that is awarded by the Pennsylvania Early Learning Keys to Quality. Students seeking this certificate must have an AAS or AS in ECE or related field or higher OR have completed 45 hours towards an AAS degree in Early Childhood Education.

Upon successful completion of this program, the student should be able to:

• Develop leadership skills to enhance the student’s ability to effectively manage an early childhood program.
• Demonstrate knowledge and understanding of the importance of working with parents as partners.
• Identify and implement sound and proven business and financial management strategies.
• Identify current trends in early care and education and develop strategies for effectively implementing program policy to address these trends.
• Evaluate current practices in supervision of teaching staff and develop strategies to enhance the staff’s skill in providing high quality early care and education.

Total Credits Required: 21

Course Credits
DPR 108 Introduction to Computer Science 3
IMM 120 Web Page Development 3
NET 110 Network Technologies 3
DPR 206 Programming for the Web 3
DPR 209 PERL/CGI Programming 3
DPR 141 UNIX Operating System 3
IMM 205 Flash 3
IMM 199 Optional Co-op/Internship 3

Total Credits Required: 21
The elective courses listed below for transfer curricula are generally transferable to most institutions. However, depending on the program at the transfer institution, the courses may only be accepted as free electives. Be sure to meet with a transfer advisor when planning to transfer.

1. Business Electives
   A. For college transfer curricula: ACC 111, ACC 112, ACC 210, BUS 100, BUS 101, BUS 111, BUS 130, BUS 149, BUS 210, BUS 211, BUS 212, BUS 214, BUS 215, BUS 220, BUS 230, BUS 231, BUS 232, BUS 236, BUS 241, BUS 243.
   Under special circumstances other courses in ACC, BUS, DPR, HRM, and PLG may be permitted as electives when recommended by the advisor and approved by the dean.
   B. For career programs: courses listed as ACC, BUS, DPR, HRM, IMM, NET, and PLG

2. Computer Electives
   A. For college transfer curricula: DPR 100, DPR 105, DPR 108, DPR 113, DPR 205, DPR 222, DPR 226
   B. For career programs: courses listed as DPR, IMM and NET

3. Humanities Electives
   A. For college transfer curricula: courses listed under ART, DRA, ENG 113 or above, FRE, GER, HUM, ITA, MUS, PHI, SPA and all COMM courses listed 100 or above.
   B. For career programs: courses listed under ART, DRA, ENG 113 or above, FRE, GER, HUM, ITA, MUS, PHI, SPA and all COMM courses listed 100 or above.

4. Social Science Electives
   A. For college transfer curricula: ADJ 240, ADJ 260, ECO 210, ECO 220, EDU 200 or above, HIS 100 or above, POL 110 or above, PSY 140 or above, SOC 110 or above.
   B. For career programs: all ADJ, ECE, ECO, EDU, HIS, POL, PSY, SOC courses.

5. Science Electives
   A. For the Natural Science Curriculum (as laboratory sciences): BIO 110, BIO 111, BIO 115, BIO 200, BIO 210, BIO 230 (not Bio 117, 118 or 220), CHE 110 or above, ESS 110 or above, PHY 110 or above.
   B. For the Science for Health Professions Curriculum (as laboratory sciences): BIO 100 or above, CHE 106 or above, PHY 105, or above, SCI 100.
   C. For college transfer curricula: BIO 100 or above, CHE 106 or above, ESS 100 and above, PHY 105 and above, SCI 100 and 110.
   D. For career programs: MAT 100 or above.

6. Mathematics Electives
   A. For the Natural Science Curriculum: MAT 140 or above
   B. For the Science for Health Professions Curriculum: MAT 140 or above
   C. For college transfer curricula: MAT 120 or above
   D. For career programs: any MAT course 100 or above

7. Course 270
   Courses numbered 270 through 279 designate credits that are transferred into DCCC as electives in that discipline. These courses do not directly equate to a specific DCCC course but meet requirements to be transferred in by the College.

5/15/08
(ACC) Accounting

ACC 100 Applied Accounting
This course provides students with an understanding of the accounting cycle for service and merchandising firms. In addition, students reconcile bank accounts and maintain a manual payroll system. This course is intended for students in most career business curricula. This course is generally not transferable.

Upon satisfactory completion of this course, students should be able to:
• Record representative journal entries, post them to the general ledger, foot and balance the accounts, prepare a trial balance and complete a work sheet, financial statements and the remainder of the accounting cycle for a single proprietorship.
• Record representative business transactions for a merchandising business utilizing the appropriate special journals.
• Prepare all documents necessary for the maintenance of a checking account and prepare a bank reconciliation.
• Maintain and reconcile accounts receivable and accounts payable ledgers with appropriate control accounts.
• Compute and record adjustments for plant assets, prepaid expenses, merchandise inventory and accrued expenses.
• Maintain a payroll system.

Prereq. ENG 050, REA 050, MAT 040
3 Credits 3 Weekly Lecture Hours

ACC 111 Financial Accounting
This course provides students with a comprehensive treatment of the complete accounting cycle for both service and merchandising businesses in accordance with Generally Accepted Accounting Principles (GAAP). The course also focuses on accounting systems, concepts, issues and the preparation and analysis of financial statements.

Upon successful completion of this course, students should be able to:
• Perform all the steps of the accounting cycle in accordance with GAAP for service and merchandising businesses.
• Prepare financial statements for sole proprietorships, partnerships and corporations.
• Calculate quantities and dollar amounts of merchandise inventory and cost of goods sold using GAAP and IRS methodologies.
• Provide for uncollectible accounts receivable and calculate the estimated amount of accounts receivable that will ultimately be collected.
• Calculate depreciation, depletion and amortization, and calculate the book value of plant and intangible assets. Broadly describe the principles of internal control over assets and the accounting profession’s Code of Ethics.
• Discuss the income tax consequences resulting from the use of alternate GAAP methodologies.
• Describe the differences among cash, accrual and other comprehensive bases of accounting.
• Make calculations and prepare journal entries for various end-of-period adjustments.
• Make calculations and prepare journal entries for the issuance and redemption of debt and equity securities by corporations.

Prereq. ENG 050, REA 050, MAT 060
3 Credits 3 Weekly Lecture Hours

ACC 115 Computerized Accounting
This course provides students with an understanding of the accounting cycle for service and merchandising firms. In addition, students reconcile bank accounts and maintain a manual payroll system. This course is intended for students in most career business curricula. This course is generally not transferable.

Upon satisfactory completion of this course, students should be able to:
• Maintain a payroll system.
• Prepare budgets and variance analysis.
• Prepare reports and analysis utilizing systems and techniques which enable management to perform their functions of planning, controlling and decision making.

Prereq. ACC 100
3 Credits 3 Weekly Lecture Hours

ACC 119 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

ACC 201 Introduction to Cost Accounting
This course provides students with a thorough understanding of cost accounting concepts, cost behaviors, and cost accounting techniques as applied to manufacturing cost systems.

Upon successful completion of this course, students should be able to:
• Interpret the purpose of cost accounting and the uses of cost accounting data.
• Define the three basic elements of cost.
• Using the process and job cost systems, record the complete accounting cycle. Apply factory overhead to work in progress production units.
• Define factors to be considered in establishing standard costs.
• Compute and analyze variances from standard using the two variances methods. Determine the basis and calculate cost allocations.
• Prepare budgets and variance analysis.

Prereq. ACC 100 or 111
3 Credits 3 Weekly Lecture Hours
ACC 202  Introduction to Tax Accounting
The primary objective of this course is to gain a practical understanding of the personal income tax, various payroll taxes and the Pennsylvania sales tax. Students will demonstrate an understanding of these taxes by making appropriate calculations and preparing current tax forms. This is a required course for students in the accounting curriculum and an elective for students enrolled in other career programs. Credit for this course will not be given to students who attain credit for Federal Income Tax Accounting (ACC 210).

Upon satisfactory completion of this course, students should be able to:
- Discuss the history and objectives of the U.S. tax system.
- Determine who must file a tax return, filing status, personal and dependent exemptions, and the standard deduction.
- Identify items to be included in and excluded from gross income.
- Calculate capital gains and losses.
- Complete tax returns for the self-employed.
- Compute deductions for adjusted gross income.
- Identify and calculate itemized deductions.
- Compute the income tax liability using tax tables and tax rate schedules. Identify and calculate various tax credits and prepayments.
- Complete tax forms for the employer's reporting of FICA, State and Federal Unemployment Compensation tax, and Pennsylvania sales tax.

3 Credits 3 Weekly Lecture Hours

ACC 210  Federal Income Tax Accounting
The objectives of this course are to explore the role of the personal income tax in the U.S. economy and to gain familiarity with income tax fundamentals. The course is intended as a business elective for students in the Business Administration curriculum and as a general elective for students enrolled in other transfer programs. Credit for this course will not be given to students who attain credit for Introduction to Tax Accounting (ACC 202).

Upon successful completion of this course, students should be able to:
- Discuss the revenue, social and economic objectives of the U.S. income tax.
- Discuss the history of the income tax in the United States.
- Describe how tax changes become law, recent tax reforms and the tax-planning process.
- Gain familiarity with income tax fundamentals income concepts, exclusions, deductions, tax rates and credits.
- Calculate capital gains and losses and discuss their treatment.
- Calculate the deductions for medical expense, casualty losses, taxes, contributions, interest and expense of earning a living.
- Identify tax policies intended to contribute to full employment and national defense.
- Calculate depreciation and investment credit.
- Discuss common recognition postponement techniques.

Prereq. ACC 111
3 Credits 3 Weekly Lecture Hours

ACC 251  Intermediate Accounting I
This course is a comprehensive study of contemporary accounting theory, concepts, and procedures and their application to financial reporting. Intermediate problems pertaining to cash, receivables, inventories, plant and equipment, and investments in securities are presented. Understanding of the concepts covered in this course is crucial to successfully completion of all subsequent financial accounting and courses in the accounting sequence.

Upon satisfactory completion of this course, students should be able to:
- Discuss the need for a conceptual framework for accounting.
- Explain the importance of recognizing, measuring and reporting income and the content, purposes and limitations of a balance sheet.
- Define cash and identify those items that are properly classified as cash.
- Describe and apply generally accepted accounting principles for temporary and long-term investments.
- Discuss issues involved in valuation and reporting of accounts and notes receivable.
- Describe and explain the nature of inventories, the accounting for inventories, and effect of inventory accounting alternatives on the financial statements.
- Distinguish between tangible and intangible assets, and understand the types of problems and related solutions involved in recording the acquisition, utilization and retirement of real property, equipment and intangible assets.

Prereq. ACC 210
3 Credits 3 Weekly Lecture Hours

ACC 252  Intermediate Accounting II
This course is a continuation of Intermediate Accounting I. Intermediate problems pertaining to current and long-term liabilities, stockholders' equity, pensions, financial statement analysis, price-level accounting, and cash flow reporting are presented. Understanding of the concepts covered in this course is crucial to successful completion of all subsequent financial accounting and auditing courses in the accounting sequence.

Upon satisfactory completion of this course, students should be able to:
- Define, classify and measure all types of liabilities.
- Explain various types of long-term debt securities and the procedures involved in accounting for bonds and long-term notes.
- Apply appropriate accounting procedures to the issuance of capital stock under a variety of different situations.
- Identify and explain the accounting significance of transactions and events that cause the balance in the retained earnings account to change.
- Calculate primary and fully diluted earnings per share under a variety of different circumstances.
- Discuss the economic, accounting and practical issues involved in revenue recognition.
- Explain and apply appropriate accounting procedures for interim and interim income tax allocation.
- Apply appropriate procedures to account for operating leases and capital leases by the leasee and lessor.
- Identify and describe the objectives and limitations of the cash flows statement.
- Discuss the objectives and the methods of financial statement analysis.

Prereq. ACC 211
3 Credits 3 Weekly Lecture Hours

ACC 253  Advanced Accounting
This course is an in-depth study of selected accounting topics, including partnerships, consolidations, business combinations, bankruptcy, corporate reorganizations and multinational companies. It presents both the theoretical and applied aspects of these topics. CPA problems will be reviewed.

Upon successful completion of this course, students should be able to:
- Discuss the environmental factors and the underlying theoretical structure related to the accounting discipline.
- Prepare consolidated financial statements under a variety of circumstances.
- Properly record and report the domestic firms transactions that are denominated in foreign currency.
- Explain accounting for partnerships from formation to dissolution.
- Record events and exhibit results in the specialized area of governmental accounting.
- Explain the accounting procedures for nonprofit organizations such as universities, hospitals, and voluntary health and welfare organizations.
- Complete accounting procedures unique to estates and trusts.

Prereq. ACC 252
3 Credits 3 Weekly Lecture Hours

ACC 254  Auditing
An intensive course that integrates accounting standards, accounting systems, internal accounting controls, and the dual auditing functions of investigating and reporting all within the context of the professional practices environment. Upon successful completion of this course, students should be able to:
- Define and discuss the social functions of auditing, the structure of authoritative standards, professional ethics and legal liability.
- Discuss the conceptual structures that underlie the audit process by establishing the linkage between the risk of material misstatement of financial statements and the evidence that the auditor gathers to reduce audit risk to an acceptable level.
- Discuss the planning phase of the audit engagement.
- Describe the study and evaluation of internal accounting controls.
- Describe common substantive audit tests for items such as cash, inventory and accounts receivable.
- Prepare various types of reports that can be issued in an audit of financial statements.
- Prepare special reports such as forecasts and projections.
- Discuss compilations and review services for nonprofit companies.

Prereq. ACC 252
3 Credits 3 Weekly Lecture Hours

(ADJ) Admin. of Justice

ADJ 101  Introduction to Criminal Justice
A study of the agencies, processes and people involved in the criminal justice administration. Legislatures, law enforcement, prosecutor and defense counsel, courts, corrections and private security are studied with respect to function, role and the problems of justice administration in a democratic society, with emphasis on intercomponent relations, checks and balances, and discretionary powers.

Upon successful completion of this course, students should be able to:
- Describe how the criminal law changes to help achieve the social order in our society.
- Evaluate the historical contributions to our present Anglo-American system of justice.
- Evaluate the various theories that have been proposed relative to crime as a social phenomenon.
- Identify, explain and evaluate the current process of each element of the criminal justice system in terms of their stated goals: crime prevention, arrest, prosecution and rehabilitation of the offender.
- Evaluate the historical contributions of Great Britain to our present American system of law enforcement and describe its major impact on the role, function, authority and mission of the US Criminal Justice System.

3 Credits 3 Weekly Lecture Hours

ADJ 110  Criminal Law
Criminal Law, the foundation upon which the Criminal Justice System is built, encompasses theoretical concepts from sociology, psychology, political science, philosophy, theology and economics. It affects both the people it serves and those employed by the Criminal Justice System. The legal foundations of the U.S. Criminal Justice System are introduced to the student. Criminal offenses outlined by Delaware County Community College
ADJ 100 Principles of Investigation

As an introduction to criminal investigations, this course is designed to serve students seeking careers in law enforcement, courts and corrections as well as private security. It includes professional conduct at the crime scene, interviews and interrogations of witnesses and suspects, the use of informants, the techniques of surveillance and presentation of the case in a court of law.

Upon successful completion of this course, students should be able to:

- Discuss the history and development of criminal investigation.
- Develop the concept of investigative leads based on information uncovered during the investigative process.
- Analyze the various procedures used in gathering and handling evidence at the crime scene.
- Discuss the impact of Supreme Court decisions on the ability to gather information in the investigative process and preparation of information for court testimony.

ADJ 130 The Elderly and the Criminal Justice System - Special Studies

Prereq. SOC 110 or SOC 111 or PSY 110

3 Credits  3 Weekly Lecture Hours

Upon successful completion of this course, students should be able to:

- Explain the importance of the criminal law in maintaining social order.
- Describe the basic components of the Criminal Justice System.
- Analyze the concept of criminal liability.
- Define the elements of specific crimes.
- Recognize the requirements of various Pennsylvania criminal statutes.
- Identify the liabilities of individuals convicted of criminal violations.
- Identify and apply the most frequently used substantive defenses to charges of criminal acts.
- Investigate the impact of the U.S. Constitution to the Criminal Justice System.

Prereq. ENG 050 and REA 050 or pass test

3 Credits  3 Weekly Lecture Hours

ADJ 199 Co-op/Internship

Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

ADJ 201 Organization and Management of Justice Agencies

This course surveys the organizational framework of justice agencies that include police agencies at each level of government and with diverse missions; courts of original and appellate jurisdiction; federal and state prisons and the county jail. It covers proper administrative techniques including policy development, public relations, budgeting, communications and operation procedures.

Upon successful completion of this course, students should be able to:

- Identify and explain the nine major organizational principles and practices that control operations of justice agencies.
- Explain how a system design reflects the actual plan of action for the entire organization.
- Explicate the process of communications as an administrative tool.
- Analyze the administrative aspects of personnel, including policy development, public relations, budgeting, communications and operation procedures.
- Evaluate the concept of management by objectives.

Prereq. ENG 050 and REA 050 or pass test

3 Credits  3 Weekly Lecture Hours

ADJ 202 Terrorism: History, Threat and Response

Introduces the historical and contemporary issues relevant to domestic and international terrorism. Examines methods utilized by law enforcement and intelligence agencies in preventing and detecting terrorism. The constitutional and sociological dilemmas involved in investigating terrorist acts and the threat to the right to privacy and suspension of individual rights will be explored.

Upon successful completion of this course, students should be able to:

- Define terrorism both in terms of violence and of propaganda.
- Review the historical perspectives and complexities of terrorist causes and doctrines.
- Evaluate media coverage in terrorist crisis situations.
- Cite the major international and domestic terrorist organizations in the U.S.
- Cite the major reasons why the U.S. has become a target of terrorism.
- Delineate the philosophies of the leading international and transnational terrorist organizations.
- Explain hostage-taking strategies and the tactics utilized by democratic governments in response to terrorism.

Prereq. ADJ 101, ADJ 110

3 Credits  3 Weekly Lecture Hours

ADJ 203 Contemporary Issues in Criminal Justice

This course provides the advanced Administration of Justice student a focus on the leading issues confronting the various elements of the justice system, to research and develop possible remedies to address these issues, and to assist the student in making intelligent career decisions.

Upon successful completion of this course, students should be able to:

- Defend a position on the decriminalization of victimless crimes.
- Evaluate the merit of the several states individually defining crime and punishment.
- Justify uniformity in the standards, policies and procedures of our state justice systems.
- Detail the advantages and disadvantages of plea negotiation (bargaining).
- Evaluate the creation of a public service office entirely separate from the police force to provide social and human services.
- Summarize the major issues involved in police prosecutor and court discretionary powers.
- Depict the supervisory and enforcement functions of the probation/parole office.
- Analyze the current treatment of the youthful offender and suggest more viable alternatives.

3 Credits  3 Weekly Lecture Hours

ADJ 205 Victimology Special Studies

Prereq. ADJ 101 or PSY 110 or SOC 111

3 Credits  3 Weekly Lecture Hours

ADJ 220 Investigation of Death and Bodily Injury

A course directed to medicolegal investigation of death under a variety of circumstances and applicable tort action.

Upon successful completion of this program, students should be able to:

- Provide a forensic definition of death.
- Differentiate among cause, manner and mechanism of death.
- Discuss the law generally with respect to trauma and disease in civil, tort and worker’s compensation cases.
- List the four major categories of death due to asphyxia.
- Describe the differences and similarities in the investigation of death by asphyxia and death by drowning.
- Provide a correlation of postmortem findings with roadside accidents in explaining causes of death and/or the accident.
- Explain why it is necessary to identify and separate various types of lesions.
- List and explain some general procedures to be followed during an autopsy.
- Identify the various aspects and reasoning of the medicolegal autopsy report.

Prereq. ADJ 120

3 Credits  3 Weekly Lecture Hours

ADJ 221 Introduction to Criminalistics

Criminalistics, the work of the forensic laboratory, is a separate study associated with the field of criminal investigation. Although the investigator may not aspire to the function of the laboratory expert, there does remain for him a great deal of elementary science that he can master. In general, the investigator should know the methods of discovering, field testing, preserving, collecting and illustrating evidence, as well as the significance of evidence, the significance of evidence analysis and comparison to private and public law enforcement investigations.

Upon successful completion of this course, students should be able to:

- Demonstrate an understanding of the legal guidelines governing the collection, preservation and admissibility of evidence.
- Demonstrate an understanding of the crime scene as the focal point of any criminal investigation.
- Analyze the value of body fluids in at least six of the major crimes against the person and property.
- Discuss the major considerations with respect to the collection and processing of trace evidence.
organize a systematic way of clarifying ethical decisions.

• Define social customs and its role in behavioral constraint.

Students should be able to:

Upon successful completion of this course, students should be able to:

• Cite the organizations established to investigate causes and types of arson.
• Depict the role of fire personnel in arson suppression.
• Detail the significant scientific aids available to the fire investigator.
• Outline the urban and suburban incendiaric fire patterns that have increased in the last decade.
• Conduct interviews to establish fire causes.
• Write a comprehensive permanent record of a case and provide guidance in the preparation and conduct of litigation.
• Develop skills essential to offering expert testimony in civil and criminal arson cases.

ADJ 222 Arson Investigation

This course enables students to become familiar with the problems inherent in determining the causes of fires, recognition of arson, preservation of evidence and successful prosecution of those responsible.

Upon successful completion of this program, students should be able to:

• Argue the validity of the statement that positive policy changes favorable to their respective objectives.
• Explain the legal and political techniques used by justice practitioners and protest groups in attempting to effect critical assessment of the criminal justice system and its ability to respond to crime as a social problem is conducted.

Upon successful completion of this course, students should be able to:

• Differentiate between the legal and non-legal definitions of crime and the criminal. Identify the various indices of crime in America. Trace the historical evolution of law and crime in western societies from a private to a public concern. Explain the major theories of crime causation.
• Identify the components, roles and functions of the criminal justice system in terms of the sociology of law and the administration of justice.

ADJ 240 Criminology

An examination of the field of criminology, including classical and contemporary theories, nature and causes of crime and criminal behavior. Patterns of criminal behavior, including property crimes, violent crimes, organized crime, white-collar crime, and victimless crime are discussed. A critical assessment of criminal justice system and its ability to respond to crime as a social problem is conducted.

 Upon successful completion of this course, students should be able to:

• Identify professional issues within the context of ethics.

ADJ 220 Ethics in Criminal Justice Special Studies

This course is designed to educate the justice student about the problems encountered by each element of the justice system as a result of poor community relations. It identifies the tactics and field procedures of justice practitioners as well as the psychological, social and cultural obstacles that contribute to the public relations problems.

Upon successful completion of this course, students should be able to:

• Identify the components, roles and functions of the criminal justice system in terms of the sociology of law and the administration of justice.

ADJ 250 Contemporary Police Services

An examination of the foundations of police services that include both patrol and investigative functions. The course is directed to analysis and commentary of municipal police as an agency of law enforcement and human services delivery. Typical areas include training, enforcement procedures, structure and organization, philosophy and contemporary issues regarding stress, unionization, employment practices, youth problems, human relation issues, corruption and accountability.

Upon successful completion of this course, students should be able to:

• Explain the distribution of police power within the U.S. governmental system.
• Discuss the role, discretion and limits of police power in a democracy.
• Explicate the importance of uniformed patrol in modern police service.

ADJ 253 Community Relations and the Justice Practitioner

This course is designed to educate the justice student about the problems encountered by each element of the justice system as a result of poor community relations. It identifies the tactics and field procedures of justice practitioners as well as the psychological, social and cultural obstacles that contribute to the public relations problems.

Upon successful completion of this course, students should be able to:

• Argue the validity of the statement that positive community relations between justice practitioners and society is the cornerstone of crime prevention.

ADJ 260 Corrections-Probation-Parole

This course exposes students to the process of corrections-probation and parole. It includes an in-depth study of the historical evolution of the institutions, functions, organization and problems from antiquity to the present as well as the attendant philosophies of justice and punishment. Probation and parole as integral parts of the corrections process, and the two major rehabilitative techniques are discussed separately.

Upon successful completion of this course, students should be able to:

• Analyze the various theories that have been proposed relative to crime causality.
• Identify and apply the various bases for corrections.
• Trace the development of the correctional system in the United States.
• Evaluate the rationale that corrections is one of society’s agencies of social control that attempts to rehabilitate or neutralize criminal and delinquent behavior.
• Identify and resolve the philosophical differences between custody and treatment of the offender.

ADJ 261 The Youthful Offender

An in-depth study of factors that relate to juvenile delinquency, prevention, treatment and control; a multi-disciplinary orientation. The most popular interdisciplinary issues, ideas, principles and assumptions pertaining to delinquency are presented, as well as the duties, responsibilities and functions of the agencies in the criminal justice system that deal with the juvenile delinquent.

Upon successful completion of this course, students should be able to:

• Trace the history of the development of the concept of the delinquent child from World War II to the present.
• Demonstrate that delinquency has social, psychological and legal causes.
• Identify, describe and justify the major programs and processes that have been established by delinquency law.
• Analyze the concept of the Youth Services Bureau.
• Evaluate the legally required and discretionary responses of law enforcement agencies when dealing with the juvenile.

ADJ 262 U.S. Courts: Contemporary Issues and Problems

This course provides students, particularly students of criminal justice, an overview of the legal basis, structure, organization, policies and jurisdiction of the U.S. courts. The course examines the dynamics of the U.S. courthouse, the interaction of the key participants and the quality of justice dispensed there. Finally, contemporary issues and problems such as judicial discretion, sentencing, political influence, plea negotiation, and the usurpation of the lawmaking process and power by the courts through judicial review are presented from both a philosophical and applied perspective.
Upon successful completion of this course, students should be able to:

- Identify the pivotal role of the courts in justice administration.
- Provide an overview of the legal bases of the criminal courts, criminal procedure and criminal law.
- Identify and evaluate the actors who, on a daily basis, must make the critical decisions through ministerial duties and discretionary powers to further social ordering in the U.S. courts.
- List the most common functions of U.S. judges.
- Follow the stages through which a criminal case must pass from arrest to the verdict and explain how and why cases leave the process.
- Identify the competing theories of sentencing and discuss the legal basis for the wide range of discretionary power over sentencing by the judge.

3 Credits 3 Weekly Lecture Hours

ADF 263 Alternatives to Prison

Offenders sent away to prison return, sooner or later, to free society. But prison may not only fail to rehabilitate many offenders, it may also exacerbate their criminal tendencies. Criminal justice authorities, therefore, have long sought realistic, workable alternatives to confinement. In recent years, the emphasis has been upon involving offenders in programs and facilities based within the community. Such programs allow society to provide offenders with only the amount of supervision they require. Probation and parole are two methods most often used to replace imprisonment with community supervision.

Upon successful completion of the course, students should be able to:

- Identify and apply the various philosophical bases for corrections reflecting society's differing attitudes toward the proposed response to the deviate behavior of the offender, which it charges to the courts and correctional processes in carrying out the two fundamental responsibilities of government: 1) protection of society and 2) rehabilitation of the convicted offender.
- Describe the process of probation including its historical evolution from the 16th century to the present; its goals and objectives; and its methods of operation within the context of constitutional rights of the offender.
- Provide an overview of the law enforcement and therapeutic duties, functions and roles of parole and probation officers.
- Define the term "alternatives to incarceration" provide an overview of the leading examples available to judicial and correctional professionals and evaluate their contributions to the goal of rehabilitation of the offender.
- Compare and assess the relative effectiveness of probation, parole and community corrections facilities particularly as alternatives to incarceration.

3 Credits 3 Weekly Lecture Hours

ADF 280 Organized Crime

A foundation course in systematic criminality that addresses those organizations whose method of operation includes fear, violence and corruption to achieve strategic and financial goals. These organizations are highly structured and staffed by hard-core, disciplined career criminals operating in secrecy and anonymity through the legal, quasi-legal and criminal activities. Governmental agencies responsible for investigating organized crime as well as legal sanctions employed by these agencies will also be examined.

Upon successful completion of this course, students should be able to:

- Define Organized Crime.
- Explain the history of organized crime in America.
- Identify and explain the areas of influence employed by organized crime.
- Prepare an overview of the international impact of organized crime.
- Discuss the tactical and strategic response of governmental entities to counter the influence of organized crime.

4 Credits 4 Weekly Lecture Hours

(AHA) Health Administration

AHA 206 Reimbursement and Financing Methods

Health care is the largest service industry in the United States. Health care managers are controllers of significant financial resources that must be managed with an eye toward the bottom line in a highly competitive marketplace. They must be well versed in the areas of financial planning, budget controls and reimbursement for services provided.

This course provides information and detailed approaches for the construction and monitoring of a budget in a health care setting. It also explores reimbursement trends and issues from the perspectives of providers, payers and consumers of health care.

Upon successful completion of this course, students should be able to:

- Define reimbursement in discussing the financial aspects of health care.
- Describe strategies and processes for projecting supply expenses, as well as costs related to personnel salaries and fringe benefits.
- Develop a format for capital budget planning.

3 Credits 3 Weekly Lecture Hours

AHA 207 Ethical/Legal Aspects of Health Care Management

Rapid advances in medical technology challenge legal and ethical standards, and create situations requiring moral decisions. This course provides students with an introduction to law, ethics and bioethics as they apply to decision making in the health care setting. It is not the intent to provide students with right or wrong answers for ethical issues. Emphasis is on use of appropriate language, application of ethical principles, and use of critical-thinking skills to articulate a point of view on current issues in health care.

Upon successful completion of this course, students should be able to:

- Use appropriate terminology to discuss ethical/legal issues in health care.
- Explain the nature of human value development.
- Analyze common theories and methods used in making ethical decisions.
- Evaluate ethical/legal positions that pertain to current controversies in health care.
- Describe legal concepts of concern to the health care manager.

3 Credits 3 Weekly Lecture Hours

AHA 209 Philosophy of Managed Care

Managed care is now mainstream in America's health care system and has changed the delivery of health care services. Individuals working in the health care arena need to understand the impact of managed care on patients and providers. This course will review the evolution of managed care explore how it works, contemplate its future and discuss the ethical issues surrounding it today. Also in the course the roles and responsibilities of the case manager will be investigated, as well as the tools used to coordinate the delivery of cost-effective quality care.

Upon successful completion of this course, students should be able to:

- Describe key concepts of the philosophy of managed care.
- Explain the paradigm shift from fee-for-service to capitation.
- Define specific terminology utilized in managed care models.
- Specify the roles and responsibilities of the case manager.
- Identify critical components in developing and implementing treatment plans.
- Explain the role of critical pathways and disease management strategies.
- Describe the role of the case manager and/or health care provider in client advocacy and ethical decision making.

3 Credits 3 Weekly Lecture Hours

AHA 210 Outcomes Measurement and Management

Health care providers constantly gather data to reach diagnostic conclusions and guide a patient through a treatment course that will optimize the eventual outcome. The driving forces of health care economics mandate that practitioners monitor and evaluate clinical effectiveness as
well as the performance of the health care organization. This course addresses measurement as a basis for making judgments and decisions about outcomes as well as measurement as a basis for future improvements. The results of outcomes and their interest to providers, accrediting bodies, purchasers and users of providers’ services are used both to stimulate contemporary thinking about important dimensions of outcomes measurement as well as the design of patient-centered frameworks for managing and improving care and services.

Upon successful completion of this course, students should be able to:
- Apply the concepts and methods of outcomes measurement.
- Identify the benefits and barriers to measurement of outcomes.
- Relate the interconnected processes that affect patient health outcomes.
- Describe current techniques in assessing clinical and organizational effectiveness.

Prereq. AHA 209

3 Credits 3 Weekly Lecture Hours

AHA 213 Managing Utilization and Risk

It is essential for health care facilities to be able to control and manage the use of their services to minimize the risk of financial loss. Utilization review monitors and provides appropriate incentives to influence the use of health care services. Risk management employs proactive efforts to prevent adverse events related to clinical care and facility operations, especially malpractice. The proper use of utilization review and risk management measures has the potential to achieve significant containment of health care costs, an essential outcome in our present health care system.

This course explores the concepts of risk management and utilization review in payor and provider organizations.

Upon successful completion of this course, students should be able to:
- Trace the history and development of utilization review and risk management processes.
- Describe the requirements for utilization review procedures in relation to various payor organizations (managed Medicare, Medical Assistance and private insurers). Analyze the role of the physician and other health care personnel in utilization review.
- List the various mechanisms used in the utilization review process by payor and provider organizations.
- Explain the role of the health care manager in the utilization review process.
- Trace the development of legal doctrines and concepts of individual responsibility.
- Cite landmark court decisions that have increased the liability of health care institutions.
- Identify the procedures used for documenting and reporting deviations from institution policy or accepted standards.
- Develop a description of the role and rationale for a health care institution manager's participation in the risk management process.

Prereq. AHA 209

3 Credits 3 Weekly Lecture Hours

AHA 217 Quality Improvement and Accreditation Process

As the health care delivery environment changes, regulatory systems evolve to meet consumer mandates for objective measure of organizational performance, and the quality and effectiveness of health care services. Quality of care is more than a vague concept; it is how an institution and its care providers perform. Measuring performance requires managing both processes and outcomes, quantifying performance results and taking action to improve results.

This course presents a design for performance assessment and improvement planning, goals and objectives, essential elements and a cultural climate for change. It also presents a practical introduction to accreditation processes. The requirements of the Joint Commission for Accreditation of Healthcare Organizations (JCAHO) and other accrediting bodies are explored. Current accreditation trends and issues are also discussed.

Upon successful completion of this course, students should be able to:
- Identify important elements of ongoing data collection.
- Describe essential steps in developing performance-based assessment programs.
- Discuss techniques for comparing institutional performance to external performance data.
- Relate JCAHO standards to institutional assessment and improvement initiatives.
- Assess the value and purpose of the accreditation process and JCAHO accreditation standards.
- Discuss current management concepts related to organizational performance measurement and improvement.
- Consider the role of health care data/information management and health care databases as mechanisms for organizational performance measurement.
- Review the development and focus of JCAHO’s functional approach to performance measurement and improvement in health care organizations.
- Explore current literature relevant to organizational performance improvement and accreditation issues.

Prereq. AHA 209

3 Credits 3 Weekly Lecture Hours

AHA 280 Assessment I

These course numbers which are 3 credits each, are part of the advanced standing component of the Health Care Management program. The student works with an assessment counselor to create a portfolio for evaluation by the allied health dean or appointee. The student must have knowledge to earn all fifteen credits or advanced standing is not awarded.

3 Credits 3 Weekly Lecture Hours

AHA 281 Assessment II

These course numbers which are 3 credits each, are part of the advanced standing component of the Health Care Management program. The student works with an assessment counselor to create a portfolio for evaluation by the allied health dean or appointee. The student must have knowledge to earn all fifteen credits or advanced standing is not awarded.

3 Credits 3 Weekly Lecture Hours

AHA 282 Assessment III

These course numbers which are 3 credits each, are part of the advanced standing component of the Health Care Management program. The student works with an assessment counselor to create a portfolio for evaluation by the allied health dean or appointee. The student must have knowledge to earn all fifteen credits or advanced standing is not awarded.

3 Credits 3 Weekly Lecture Hours

AHA 283 Assessment IV

These course numbers which are 3 credits each, are part of the advanced standing component of the Health Care Management program. The student works with an assessment counselor to create a portfolio for evaluation by the allied health dean or appointee. The student must have knowledge to earn all fifteen credits or advanced standing is not awarded.

3 Credits 3 Weekly Lecture Hours

AHA 284 Assessment V

These course numbers which are 3 credits each, are part of the advanced standing component of the Health Care Management program. The student works with an assessment counselor to create a portfolio for evaluation by the allied health dean or appointee. The student must have knowledge to earn all fifteen credits or advanced standing is not awarded.

3 Credits 3 Weekly Lecture Hours

(AHM) Allied Health Medical

AHM 100 Orientation to Health Care

This course prepares students to understand the development and use of health care facilities within a community environment. The role of health care providers, the impact of socio-economic factors upon health care, health maintenance and the influence of technology upon health care are examined.

Upon successful completion of this course, students should be able to:
- Describe the major health care organizations and agencies and their role in the health care delivery systems.
- Describe health care trends and economics.
- Discuss common problems of health and diseases affecting the population.
- Describe the basic organizational principles of a typical health care facility.
- Identify and describe the role of members of the health care team.
- Describe the communication and interpersonal skill required by health team members.
- State the legal and professional responsibilities of allied health team members.

3 Credits 3 Weekly Lecture Hours

AHM 104 Body Structure/Function I

This course begins with an analysis of the structural foundation of the body and its ability to function integrating the levels of organization: chemical cellular, tissue, organ, and system. The course then emphasizes the anatomical structure, physiology, and selective disease processes specific to the integumentary, skeletal, muscular, lymphatic, circulatory, and respiratory systems. Mechanisms by which the body maintains fluid and electrolyte balance and acid base balance are also emphasized. Upon successful completion of this course, students should be able to:
- Analyze the architectural plan of the human body as a whole, the organization of its functional units, and the mechanisms by which it performs its various activities.
- Discuss the mechanism and patterns of disease-causing pathogens and neoplasms, and the body’s response to threat of injury and disease.
- Explain the function and interrelationship of fluids and electrolytes, the mechanisms by which the constancy of total body fluids is maintained, and regulation of the add-base balance.
- Describe the structure and function of the integumentary system and major disorders of this system.
- Describe the structure and function of the skeletal and muscular systems as well as disorders of these systems.
- Describe the structure and function of the circulatory and lymphatic systems as well as disorders of these systems.
- Describe the structure and function of the respiratory system as well as disorders of this system.

Coreq. AHM 233

3 Credits 3 Weekly Lecture Hours

AHM 233 Body Structure/Function II

This course continues with an analysis of the structural foundation of the body and its ability to function integrating the levels of organization: chemical cellular, tissue, organ, and system. The course then emphasizes the anatomical structure, physiology, and selective disease processes specific to the integumentary, skeletal, muscular, lymphatic, circulatory, and respiratory systems. Mechanisms by which the body maintains fluid and electrolyte balance and acid base balance are also emphasized. Upon successful completion of this course, students should be able to:
- Analyze the architectural plan of the human body as a whole, the organization of its functional units, and the mechanisms by which it performs its various activities.
- Discuss the mechanism and patterns of disease-causing pathogens and neoplasms, and the body’s response to threat of injury and disease.
- Explain the function and interrelationship of fluids and electrolytes, the mechanisms by which the constancy of total body fluids is maintained, and regulation of the add-base balance.
- Describe the structure and function of the integumentary system and major disorders of this system.
- Describe the structure and function of the skeletal and muscular systems as well as disorders of these systems.
- Describe the structure and function of the circulatory and lymphatic systems as well as disorders of these systems.
- Describe the structure and function of the respiratory system as well as disorders of this system.

Coreq. AHM 280

3 Credits 3 Weekly Lecture Hours

AHM 280 Assessment I

These course numbers which are 3 credits each, are part of the advanced standing component of the Health Care Management program. The student works with an assessment counselor to create a portfolio for evaluation by the allied health dean or appointee. The student must have knowledge to earn all fifteen credits or advanced standing is not awarded.

3 Credits 3 Weekly Lecture Hours

AHM 281 Assessment II

These course numbers which are 3 credits each, are part of the advanced standing component of the Health Care Management program. The student works with an assessment counselor to create a portfolio for evaluation by the allied health dean or appointee. The student must have knowledge to earn all fifteen credits or advanced standing is not awarded.

3 Credits 3 Weekly Lecture Hours

AHM 282 Assessment III

These course numbers which are 3 credits each, are part of the advanced standing component of the Health Care Management program. The student works with an assessment counselor to create a portfolio for evaluation by the allied health dean or appointee. The student must have knowledge to earn all fifteen credits or advanced standing is not awarded.

3 Credits 3 Weekly Lecture Hours

AHM 283 Assessment IV

These course numbers which are 3 credits each, are part of the advanced standing component of the Health Care Management program. The student works with an assessment counselor to create a portfolio for evaluation by the allied health dean or appointee. The student must have knowledge to earn all fifteen credits or advanced standing is not awarded.

3 Credits 3 Weekly Lecture Hours

AHM 284 Assessment V

These course numbers which are 3 credits each, are part of the advanced standing component of the Health Care Management program. The student works with an assessment counselor to create a portfolio for evaluation by the allied health dean or appointee. The student must have knowledge to earn all fifteen credits or advanced standing is not awarded.

3 Credits 3 Weekly Lecture Hours

(AHM) Allied Health Medical
AHM 105  Body Structure/Function II
This course emphasizes the anatomical structure, physiology, and selective disease processes specific to the digestive system, urinary system, nervous system and sense organs, endocrine system, and reproductive systems. How nutrition, growth, development, aging, and genetics influence body structure and function is also emphasized.
Upon successful completion of this course, students should be able to:
• Describe the structure and function of the digestive system as well as disorders of this system.
• Describe adequate nutrition and the complex mechanism of metabolism, as well as disorders associated with eating and metabolism.
• Describe the structure and function of the urinary system and major disorders of this system.
• Describe the structure and function of the nervous system and disorders of this system.
• Describe the mechanisms by which the sense organs are able to sense changes in our external and internal environments as a requirement for maintaining homeostasis; and diseases commonly affecting the sense organs.
• Describe the structure and function of the endocrine system and major disorders of this system.
• Describe the structure and function of the male and female reproductive systems, and briefly describe the major disorders inherent to these systems as well as the major disorders associated with pregnancy.
• Describe the concept of development as a biological process characterized by continuous modification and change as well as the effects of aging on major body organ systems.
• Describe genetics, the scientific study of inheritance, and its relationship to human disease.
• Describe the physiology of congenital diseases and the roles that heredity and environmental factors play in the development of these conditions.
Coreq. AHM 233
3 Credits 3 Weekly Lecture Hours

AHM 106  Medical Assistant Techniques and Practicum I
This course is structured to prepare the student to assist the physician in the clinic, hospital or private office. The responsibilities include preparation of the client for examination, measurement of basic body functions, assistance in diagnostic testing and procedures, and general operation of the office.
Upon successful completion of this course, students should be able to:
• Understand the role and function of the medical assistant in the health care delivery system.
• Evaluate the impact of disease and disease causing organisms on man and his environment.
• Describe the role of the medical assistant in assisting with physical measurements.
• Analyze the role of the medical assistant in assisting the physician with the health history and physical examination.
• Understand the role of the medical assistant in collecting and handling of specimens.
• Analyze the role of the medical assistant in assisting the physician in minor surgery.
• Understand the importance of nutrition, exercise, and diet therapy to the well being of the patient.
• Students are eligible to enroll in this course only if they are able to complete the certificare requirements of the Medical Assistant program by the upcoming Summer I or Summer II semester.
Prereq. ENG 050, REL 050, MAT 040
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

AHM 107  Medical Assistant Techniques and Practicum II
The course prepares students to assist the physician in the clinic, hospital or private office. Responsibilities include preparation of the client for examination, measurement of body functions, aiding in diagnostic tests and procedures, and general operation of the office.
Upon successful completion of this course, students should be able to:
• Analyze the role and the responsibility of the medical assistant concerning the principles of pharmacology and drug administration.
• Classify the commonly used diagnostic laboratory procedures that are utilized in a physician's office.
• Classify the commonly used diagnostic radiological procedures that are utilized in the physician's office.
• Describe the role of the medical assistant in the recording of an EKG.
• Describe the role of the medical assistant in assisting with physical therapy.
• Evaluate the role of the medical assistant during a medical emergency and giving first aid.
Prereq. AHM 106
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

AHM 108  Conditions of Illness
The various conditions of human illness are reviewed. Symptomology, the body’s response to disease, and diagnostic laboratory procedures specific to each disease are emphasized.
Upon successful completion of this course, the student should be able to:
• Understand the disease process and the treatment of pain.
• Describe common infectious diseases and neoplasms.
• Describe common congenital diseases and mental health disorders.
• Describe the diseases that are common to the urinary, reproductive, and digestive systems.
• Describe the diseases that are common to the respiratory, cardiovascular, and nervous systems.
• Describe diseases that are common to the endocrine and musculoskeletal systems.
• Describe common skin, eye, and ear disorders.
Prereq. AHM 104 or 105 or BIO 117
3 Credits 3 Weekly Lecture Hours

AHM 109  Medical Assistant Review Practicum I
This course is structured to provide the student with a review of the AHM 106 simulation laboratory experience in assisting the physician in the clinic, hospital or private office. Clinical skills covered include preparation of the client for examination, measurement of basic body functions, assistance in diagnostic testing and procedures, and general patient care procedures performed in the medical office. Upon successful completion of this course, students should be able to:
• Understand the role and function of the medical assistant in the health care delivery system.
• Describe the role of the medical assistant in assisting the physician in minor surgery.
• Understand the importance of nutrition, exercise, and diet therapy to the well being of the patient.
• Students are eligible to enroll in this course only if they are able to complete the certificare requirements of the Medical Assistant program by the upcoming Summer I or Summer II semester.
Prereq. AHM 106
1 Credit 2 Weekly Laboratory Hours

AHM 110  Medical Assistant Review Practicum II
The course prepares students with simulation laboratory experience in assisting the physician in the clinic, hospital or private office. Responsibilities include preparation of the client for examination, measurement of body functions, aiding in diagnostic tests and procedures, and general operation of the office. Upon successful completion of this course the student will be able to:
• Apply the principles of pharmacology and drug administration.
• Perform diagnostic laboratory procedures that are utilized in a physician's office.
• Perform an EKG.
• Describe the role of the medical assistant in assisting with physical therapy.
• Evaluate the role of the medical assistant during a medical emergency and giving first aid.
Prereq. AHM 106 & 107
1 Credit 2 Weekly Laboratory Hours

AHM 130  Medical Coding Concepts for Allied Health
This course, for non-coding majors, is designed to teach students general principles of ICD-9-CM (International Classification of Disease) And CPT-4 (Current Procedural Terminology) coding. Students will learn to translate medical terminology and descriptions into code numbers. In this course will will focus on coding for both inpatient and outpatient procedures. Emphasis will be placed on accuracy of coding in a variety of settings. Upon successful completion of this course, students should be able to:
• Explain the organization of both the ICD-9-CM manual and CPT-4 manual.
• Translate descriptions of diagnostic terms and symptoms into correct ICD-9-CM codes.
• Recognize and use the HCPCS (Health Common Procedural Coding System) for Medicare patients.
• Describe the DRG system and why it is of importance.
• Convert descriptions of inpatient surgical procedures into correct ICD-9-CM codes.
• Select valid CPT-4 codes and apply them to outpatient procedures for laboratory (pathology), diagnostic testing and outpatient surgical procedures.
• Apply rules and guidelines for selecting the correct ICD-9-CM and CPT-4 codes.
• Use correct codes relating to health conditions and factors using “V” codes and “E” codes from the ICD-9-CM Manual.
Prereq. AHM 233
1 Credit 2 Weekly Laboratory Hours

AHM 140  Professional and Communication Issues in Health Care
This course is designed to provide the student with the knowledge and skills needed to communicate effectively in the health care setting. Emphasis is on development of interpersonal skills for workplace and therapeutic communication. Among the topics covered are basic communication skills, conflict resolution, cultural awareness, confidentiality, and professionalism.
Upon successful completion of this course, students should be able to:
• Apply basic principles of communication in responding to verbal and nonverbal communication.
• Respond appropriately to issues of confidentiality in the health care setting.
• Demonstrate knowledge of federal and state health care legislation and regulations.
• Describe professionalism in relation to the health care setting.
• Explain the role of alternative and complimentary medicine in health care.
• Develop transcultural communication skills.

3 Credits 3 Weekly Lecture Hours

AHM 185 Medical Office Management

This course is designed to provide the student with an understanding of how a medical office runs, and the responsibilities of all staff members. In this course, the student will learn through a variety of media, how to find a position in the medical field, a history of medicine, ethical and legal considerations in medicine as well as how to handle finances for a medical office/facility. Upon successful completion of this course, the student should be able to:
• Describe the ethical and legal responsibilities of a medical office administrator.
• Demonstrate effective oral and written communication both with professionals and patients.
• Complete and evaluate third party payer requirements.
• Use and understand systems of maintaining patient clinical and financial records.
• Perform office tasks appropriate for computer solutions.
• Organize and maintain the physical requirements of a medical office.

Prereq. AHM 233

3 Credits 3 Weekly Lecture Hours

AHM 198 Medical Coding Internship

Selected medical coding experiences are provided in a health care facility or insurance company. Knowledge and guidelines basic to applying correct coding systems for appropriate reimbursement are stressed. Upon successful completion of this course, the student should be able to:
• Demonstrate an understanding of the anatomical structure and physiological functioning of the human body and of medical terms descriptive of body systems.
• Maintain ethical and legal standards of a Medical Coding Professional.
• Apply correct coding systems for appropriate reimbursement.
• Evaluate coding procedures for achievement of optimal quality in seeking appropriate reimbursement.
Prerequisites: All certificate program requirements in the Medical Coding or Medical Coding for the Health Care Professional must be completed before taking this course.

2 Credits

AHM 199 Medical Assistant Externship

Selected clinical experiences are provided in a medical office or health care facility. This is a planned activity that must be scheduled with the coordinator of the Medical Assistant program. This course is offered during summer session I and II and is limited to 24 students. A limited number of students are accepted into this course each Fall. Upon successful completion of this course, students should be able to:
• Demonstrate an understanding of the anatomical structure and physiological functioning of the human body and of medical terms descriptive of body systems.
• Apply the business/administrative and clinical duties of the medical assistant.
• Function as an assistant to the physician in a medical and/or other health care setting.
• Implement the ethical and legal responsibilities of the medical assistant in the health care delivery system.
• Apply selected principles of biophysical and psychosocial sciences in providing assistance to the physician.
• Maintain business and patient health records.
• Discuss the fundamental concepts of disease.

6 Credits 30 Weekly Laboratory Hours

AHM 220 Applied Microbiology

This is a survey course intended for allied health majors. The concepts of specimen collection and transport, identification of microorganisms, pathogenesis and control, and treatment of infectious disease are the main emphasis of the course. Clinical laboratory experiences will emphasize application of concepts to skills.

Upon successful completion of this course, students should be able to:
• Explain the relationship between the structure and function of microorganisms.
• Describe techniques of microbial control.
• Apply principles of sterile technique in specimen collection and performing laboratory procedures in the microbiology lab.
• Describe the distribution of normal and pathogenic flora for different body sites.
• Discuss antibiotic treatment for disease.
• Classify and perform diagnostic procedures of body fluid specimens.

1 Credit 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

AHM 230 Introduction to ICD-9-CM Coding Principles

The International Classification of Disease, 9th Revision, Clinical Modification (ICD-9-CM) coding system is a medical classification system used to describe diagnoses and operative (surgical and invasive) procedures. This course will teach the student the skills and knowledge necessary to determine the correct ICD-9-CM diagnosis code based on a thorough review of the medical documentation. Prospective payment rates based on diagnosis-related groups (DRG’s) have been established as the basis of payment for Medicare and other insurers. Proper ICD-9 coding is crucial to the correct DRG assignment and thus reimbursement.

Upon successful completion of this course, the student should be able to:
• Understand the format, conventions and characteristics of ICD-9-CM coding.
• Apply general guidelines and chapter specific guidelines to correctly assign ICD-9-CM codes.
• Understand the application of Official Guidelines for coding and Reporting.
• Define the steps to diagnosis coding.
• Identify the major elements of the DRG system.
• Understand the code of ethics for coders.

Prereq. AHM 233, AHM 104, AHM 105

3 Credits 3 Weekly Lecture Hours

AHM 231 Introduction to CPT-4 Coding

The primary focus of this course is to provide an overview of The Current Procedural Terminology (CPT-4) coding system. CPT is the coding system used to describe services provided by physicians. CPT is also used for services provided by hospital outpatient and ancillary departments, hospital emergency departments, and other health care facilities. This course also addresses reimbursement and compliance issues related to physician-based coding as well as the use of HCFA Common Procedural Coding System (HCPCS). Upon successful completion of this course, the student should be able to:
• Define terms, phrases and abbreviations related to medical coding.
• Discuss insurance and carrier reimbursement systems.
• Apply legal concepts to issues of medical coding.

Prereq. AHM 233, AHM 104, AHM 105

3 Credits 3 Weekly Lecture Hours

AHM 232 Advanced CPT-4 Coding

This course is designed for students who plan to work in the medical records department of a health care facility. It is intended to provide additional in depth study of coding principles, clinical topics, and case studies to increase knowledge and skills in CPT (Current Procedural Terminology) coding. The use of HCFA Common Procedural Coding System (HCPCS) is also addressed.

Upon successful completion of this course the student will be able to:
• Code accurately a procedural statement, a physician’s office visit claim, and an outpatient record, according to CPT guidelines.
• Recognize the economic and ethical implications of coding assignment on reimbursement.
• Demonstrate if coded data is of optimal quality.

Prereq. AHM 231

3 Credits 3 Weekly Lecture Hours

AHM 233 Medical Terminology

This course introduces the skills and knowledge needed to develop an understanding of the language of medicine. The mechanism of building a medical vocabulary utilizing roots, prefixes, suffixes and the combining forms, as well as the pronunciation of medical terms is emphasized. A workbook/text, audio and computer software are used to give the student hands-on experience in the use of the language of medicine.

Upon successful completion of this course, students should be able to:
• Identify word parts and their meanings in medical terms.
• Utilize reference materials to determine meaning, usage and spelling of medical terms.
• Describe the main functions of each body system.
• Define diagnostic, symptomatic and therapeutic terms related to each system.
• Identify terms describing pathology affecting body systems.
• Define anatomical landmarks, directional, positional and numeric medical terms.
• Recognize common classes of drugs and their actions.
• Recognize the correct spelling of medical terms.
• Develop a medical vocabulary.

3 Credits 3 Weekly Lecture Hours

AHM 240 Advanced ICD-9-CM Coding

This course is designed for students who plan to work in the medical records department of a health care facility. It is intended to provide additional in depth study of medical record case studies to increase knowledge and skills in ICD-9-CM diagnosis coding. DRG reimbursement methodology will also be addressed.

Upon successful completion of this course, the student should be able to:
• Given a scenario, extract the relevant diagnoses and/or procedures and code appropriately according to ICD-9-CM guidelines.
• Apply coding guidelines to accurately code principal diagnoses and procedures to determine the correct diagnosis-related group assignments.
• Demonstrate the use of ICD-9-CM coding in DRG assignment.
• Recognize the economic and ethical implications of coding assignment on reimbursement.

Prereq. AHM 230

3 Credits 3 Weekly Lecture Hours
AHN 241 Medical Billing Special Studies
This course is designed to teach students the general principles of medical billing and familiarize them with a variety of insurance plans. Students will learn to complete and use insurance claims forms and insurance related forms (referrals, pre-authorizations, registration forms). Reimbursement systems including fee-for-service payments and capitation payments will be covered in detail.
Upon successful completion of this course, students should be able to:
• Describe legal and ethical issues involved in medical billing.
• Describe and explain different types of health insurance carriers and reimbursement systems.
• Demonstrate steps involved in the reimbursement cycle.
• Complete referral, preauthorization, registration and encounter forms.
• Submit claims in paper and electronic format.
• Document billing information using correct medical terminology.
• Perform an internal and external chart audit.
• Complete a health insurance claim form and explain claim form requirements.
• Resolve claim errors and resubmit claims that have been rejected.
• Generate patient bills through interpretation of explanations of benefits/remittance advice statements.
• Follow up with insurance companies and patients regarding unpaid bills.
• Record changes, payments, and adjustments at the time of an encounter.
Prereq. AHM 233
3 Credits 3 Weekly Lecture Hours

(222x74) 4 Credits

AHN 100 Nursing Assistant Theory and Practice I
This course is designed to enable the student to acquire the knowledge and skills necessary to function as a nursing assistant in a long-term-care nursing facility in accordance with regulatory guidelines established by the Commonwealth of Pennsylvania.
Upon successful completion of this course, students should be able to:
• Function as a nursing assistant within the legal and ethical standards described by the profession of nursing as regulated by the Commonwealth of Pennsylvania.
• Demonstrate the use of effective communication skills as an integral function of the nursing assistant role.
• Apply the basic principles of infection control.
• Demonstrate the application of concepts of basic emergency procedures.
• Describe the behavior involved in providing/maintaining the rights of the resident.
• Demonstrate behaviors and skills that promote the resident’s independence.
• Describe the responsibilities of the nursing assistant in addressing the nutritional needs of the resident.
• Recognize abnormal signs and symptoms of common diseases and conditions.
• Provide for a safe, clean environment.
• Demonstrate basic nursing skills needed to meet the resident’s health and personal care requirements as directed by the licensed nurse.
• Provide care to resident when death is imminent.
• Demonstrate skills that incorporate principles of restorative care under the direction of a licensed nurse.
• Demonstrate basic skills required to identify psychosocial needs and special problems of the nursing facility or

health care agency population with disorders affecting mental and physical functioning.
• Demonstrate skills required to identify psychosocial needs for residents who are cognitively impaired.
4 Credits
52.5 Lecture Hours
375 Clinical Hours

AHN 106 Patient Care Assisting Techniques
This course is designed to teach the student the skills necessary to function as a patient care assistant in hospitals and ambulatory care facilities. The role of the patient care assistant has evolved and expanded to include diagnostic testing skills that are performed under the supervision of the professional nurse or other licensed health professional. These skills include phlebotomy, recording electrocardiography, applying basic oxygen therapy, pulse oximetry, measuring blood glucose levels, and collection and processing various body fluids for testing.
Upon successful completion of this course, the student should be able to:
• Explain the purpose of electrocardiography as it is related to the basic anatomy and physiology of the heart.
• Perform the skills necessary to complete an electrocardiogram.
• Describe basic hematology laboratory tests and the components and function of the blood.
• Perform phlebotomy skills, including venipuncture and skin puncture correctly and successfully.
• Demonstrate proper technique in obtaining blood glucose measurements and other components of blood obtained through skin puncture.
• Explain the reasons for the collection of urine, stool and sputum specimens in assessing health status and diagnosing disease.
• Perform procedures for collecting, measuring and testing urine, stool and sputum specimens appropriately.
• Describe basic anatomy and physiology of the respiratory system and the underlying principles associated with respiration.
• Demonstrate skills in administration of low-flow oxygen therapy, reservoir systems, hyperinflations therapy, and oxygen assessment.
Prereq. AHN 100
4 Credits
2 Weekly Lecture Hours
4 Weekly Laboratory Hours

AHN 291 Skin Care and Nutrition
This course explores the structure and function of the skin as an organ of protection for the body, and the nutritional needs of the person in respect to normal aging and in the presence of infection and varied disease processes. The content will include identification of and care for open wounds, pressure sores and surgical incisions as well as optimal care techniques for aging skin. The importance of adequate nutritional intake when there is an infection or disease, and the enhanced dietary requirements of aging will also be presented.
Upon successful completion of this course, students should be able to:
• Understand the nature and purpose of the skin
• Recognize the importance of maintaining skin integrity
• Describe therapeutic techniques of good skin care
• Understand the principles of nutrition and fluid balance
• Comprehend the nutritional needs of clients in a long-term care setting
Prerequisite: High School diploma or GED and experience/education as a nurse aid
1 Credit

AHN 292 Geriatrics & Mental Health
This course examines the mental and behavioral changes that constitute normal aging along with the disorders that affect mental health in the elderly. Diversity of personality characteristics among the elderly while recognizing neurological and behavioral disorders that primarily affect the elderly will be explored. Alzheimer’s Disease, and other organic brain diseases, psychological disorders and behaviors that affect socialization will be discussed.
Upon successful completion of this course, students should be able to:
• Understand general concepts related to the field of geriatrics
• Recognize the signs and symptoms of different neurological, psychological, and behavioral disorders
• Identify methods used to provide care for clients with neurological, psychological, and behavioral disorders
Prerequisite: High school diploma or GED and experience/education as a nurse aid
1 Credit

AHN 293 Mentoring & Leadership Skills
The course is designed to teach students peer-mentoring as a means of providing on-th-job guidance to other direct care workers. Students will also learn beginning management and leadership skills that can be applied to the supervisory role.
Upon successful completion of this course, students should be able to:
• Understand the role of the peer-mentoring in long term care
• Recognize the elements of good communication skills and their importance in mentoring
• Recognize the significance of cultural diversity among personnel and patients within the health care industry
• Comprehend the basics of time, stress and conflict management skills
• Know the fundamental elements of good leadership within the health care setting
Prerequisite: High School Diploma or GED and experience/education as a nurse aid
1 Credit
AHS 294 Concepts in Phys Therapy
This course is designed to teach students the concepts of physical rehabilitation and restorative care and to assist residents with a physical therapy plan of care under the supervision of a licensed Physical Therapist.
Upon successful completion of this course, students should be able to:
• Understand the primary functions of the musculoskeletal system in providing safety and movement
• Recognize the effects and benefits of rest, activity and exercise on the human body
• Comprehend the common rehabilitative/restorative treatments frequently prescribed for the elderly
• Recognize the importance of proper body mechanics in caring for residents with mobility deficits
• Apply methods to assist in performing active and active-assistive movements designed to restore and maintain physical function under the supervision of the licensed therapist or nurse
Prerequisite: High School Diploma or GED and experience/education as a nurse aide.

1 Credit

AHS 295 Geriatric Wound Prevention and Care
This course explores the fundamentals concepts of wound formation in the elderly along with wound prevention and treatment techniques. Emphasis will be placed on the observation and recognition of wound formation and wound care. Dressing the wound including skin preparation, vital signs, emergency procedures, and safety precautions, variations and precautions in handling of surgical specimens, and dressing the wound will be stressed. An intense review of the surgical specialties and the role of the unsterile circulating team member will be emphasized. The role of the scrubbed team member in the operating room will be discussed. Aseptic technique, of infection, sterilization and disinfecting methods, and aseptic technique will be reviewed as the concepts of teamwork, consideration of the surgical team during hernia repair; upper and lower gastrointestinal tract; gallbladder, biliary system, liver, pancreas, and spleen; the breast; orthopedic surgery; thyroid and parathyroid surgery; gynecological surgery; thoracic surgery; vascular, and cardiac surgery; neurosurgery; genitourinary surgery; and surgery of the ears, nose and throat.

Upon successful completion of this course, students should be able to:
• Describe the causes of wound development in the geriatric population.
• Explain the importance of wound prevention measures in the elderly.
• Identify optimal wound care procedures for the elderly.
Prerequisite: High School diploma or GED and experience/education as a nurse aide.

AHS 100 Surgical Technology I
The knowledge and technique necessary for assuming the responsibilities of the surgical technologist are emphasized. In the orientation to the operating room component, medical-legal aspects, ethics, culturally sensitive care, and the hospital and operating room environment are explored. This phase prepares the student to respond more constructively to episodes of psychological stress when in the operating room and to sponge, needle and instrument counts. Knowledge and techniques basic to effective performance as a scrubbed team member in the operating room will be stressed. Developing and improving skills in assisting the surgeon and in the organization of work by learning to use economy in time, motion, and materials will be expected. scrub experiences will be assigned, enabling the student to focus on anticipating the needs of the surgeon in order to expedite the procedure, thus minimizing the patient’s exposure to trauma, and displaying manual and mental dexterity in the use of surgical instruments and knowledge of the step-by-step procedure for specific surgical interventions. Clinical conferences will be directed at helping the student in preparing and knowing the specific uses of specialized equipment and accessory items employed in each surgical specialty. Time will be assigned for an anesthesia observation, during which the student will correlate the actions and uses of anesthetic agents. Assignment will also be made in the Central Processing, and as a second assistant to the registered nurse circulator, during which the student will focus on providing a safe, efficient environment for the surgical patient and respecting the patient’s inherent right to privacy, dignity, and safety.

Upon successful completion of this course, the student should be able to:
• Assemble the instruments, supplies, and accessory items necessary to hernia repair; upper and lower gastrointestinal tract; gallbladder, biliary system, liver, pancreas, and spleen; the breast; orthopedic surgery; thyroid and parathyroid surgery; gynecological surgery; thoracic surgery; vascular, and cardiac surgery; neurosurgery; genitourinary surgery; and surgery of the ears, nose and throat.
• Demonstrate ability to function as a scrubbed member of the surgical team during hernia repair; upper and lower gastrointestinal tract; gallbladder, biliary tree, liver, pancreas, and spleen; gynecological surgery; thyroid and parathyroid surgery; gynecological surgery; thoracic surgery; vascular, and cardiac surgery; neurosurgery; genitourinary surgery; and surgery of the ears, nose and throat.

Coreq. AHS 101 Prereq. AHS 220
6 Credits 6 Weekly Lecture Hours

AHS 101 Surgical Technology Practicum I
Clinical assignment in operating rooms of affiliating agencies. A selection of learning experience in the use and preparation of supplies and intraoperative care of the surgical patient will be assigned. Upon successful completion of this course, the student should be able to:
• Correctly open and prepare supplies used in the operating room.
• Demonstrate competence in handling basic surgical instruments.
• Provide a safe operating room environment for the surgical patient.
• Maintain sterile technique when performing hand and surgical site antisepsis.
• Complete gowing and gloving of self and members of the surgical team.
• Scrub independently during minor surgical procedures.
• Participate in positioning patients in the surgical position designated by surgeon.
• Transport a patient using correct body mechanics and safety procedures.
Coreq. AHS 100
4 Credits 8 Weekly Laboratory Hours

AHS 102 Surgical Technology II
This course is a continuation of Surgical Technology I. Knowledge and techniques basic to effective performance as a scrubbed team member in the operating room will be stressed. An intense review of the surgical specialties focuses on the normal structure and function of body parts, with discussion of common disorders requiring surgical intervention. Preparation and use of equipment supplies for surgical procedures are reviewed. The responsibility of the surgical technologist in the care and safety of the patient during the general and specialty fields of surgery will be elaborated. The role of the unsterile circulating team member is reviewed as the concepts of teamwork, consideration and cooperation of the surgical team are explored.

Upon successful completion of this course, students should be able to:
• Discuss the responsibilities of the surgical technologist in assisting the registered nurse circulator as a technician circulator during a surgical procedure.

Coreq. AHS 101 Prereq. AHS 220
6 Credits 12 Weekly Laboratory Hours

AHS 103 Surgical Technology Practicum II
Clinical assignment in operating room of affiliating agency. Knowledge and techniques basic to effective performance as a scrubbed member of general surgery and specialty surgery teams will be stressed. Developing and improving skills in assisting the surgeon and in the organization of work by learning to use economy in time, motion, and materials will be expected. scrub experiences will be assigned, enabling the student to focus on anticipating the needs of the surgeon in order to expedite the procedure, thus minimizing the patient’s exposure to trauma, and displaying manual and mental dexterity in the use of surgical instruments and knowledge of the step-by-step procedure for specific surgical interventions. Clinical conferences will be directed at helping the student in preparing and knowing the specific uses of specialized equipment and accessory items employed in each surgical specialty. Time will be assigned for an anesthesia observation, during which the student will correlate the actions and uses of anesthetic agents. Assignment will also be made in the Central Processing, and as a second assistant to the registered nurse circulator.

Upon successful completion of this course, the student should be able to:
• Identify surgical interventions, instruments sutures and accessory items used during the following: hernia repair; breast surgery; thyroid and parathyroid surgery; surgery of the biliary tract, pancreas and spleen; gastro-entero-intestinal surgery; gynecological surgery; genitourinary surgery; thoracic surgery; vascular surgery; cardiac surgery; neurosurgery; ENT; and orthopedic surgery.

Coreq. AHS 100, AHS 101
4 Credits 4 Weekly Lecture Hours
suture materials used in pediatric surgery. • Identify operative procedures, instruments, sutures and accessory items used in surgery of the burn, trauma and transplant patient. Prereq. AHS 102, AHS 103
1 Credit 3 Weekly Lecture Hours

AHS 201 Surgical Technology Practicum III
Clinical assignment in operating rooms of affiliating agencies. Selected learning experiences in general and specialty surgery will be included. Focus will be directed toward anticipatory socialization and adaptation to aid role transformation from student to graduate.

• Assemble the instruments and supplies necessary to surgery of: the eye; reconstructive plastic surgery; pediatric surgery; and surgery of the burn, trauma, and transplant patient.
• Demonstrate ability to function as a member of the scrubbed surgical team during surgery of: the eye; reconstructive plastic surgery; pediatric surgery; and surgery of the burn, trauma, and transplant patient.
• Become socialized to new facility environment to aid in role transformation from student to graduate.
Coreq. AHS 200
6 Credits 24 Weekly Laboratory Hours

(AHU) Allied Health Unit Clerk

AHU 100 H.U.C. Theory and Technique
This course is designed to enable students to acquire knowledge and skill necessary to function as a health unit coordinator in a health care facility.

Students who have successfully completed this course should be able to:
• Discuss the organizational structure of a health care facility.
• Describe hospital policies and procedures affecting the job performance of the health unit coordinator in the health care facility.
• Discuss the process of communication.
• Describe the receptionist’s duties of the health unit coordinator in the nursing station.
• Describe the job responsibility of the health unit coordinator in the nursing station.
• Describe the responsibilities of the health unit coordinator in the admission, transfer or discharge of a patient.
• Describe the responsibility of the health unit coordinator in transcribing physician’s orders.
• List the guidelines for job placement of the health unit coordinator.
• Apply the principles of the health unit coordinator in a clinical setting.
Prerequisites: AHS 223 with a “C” or better; DPR 100 with a “D” or better; AHS 100 with a “C” or better; AHS 130 (pre or co requisite)
6 Credits 6 Weekly Lecture Hours 12 Weekly Laboratory Hours

ARB 101 Elementary Arabic I

Special Studies
This course introduces students to Arabic alphabets, articulation of sounds, basic grammar, reading, and writing. Vocabulary words for cultural and social settings are introduced. Listening and speaking are emphasized in class and laboratory settings.

Upon successful completion of this course, students should be able to:
• Learn Arabic alphabets, sounds and articulation.
• Recognize one-way and two-way connector letters.
• Sound and write accurately long and short vowels.
• Identify the Arabic marking system for long and short vowels.
• Develop basic vocabulary, reading and comprehension.
• Apply basic grammatical structure in writing.
• Understand social manners and behavior in Arabic culture.
3 Credits 3 Weekly Lecture Hours

ARB 102 Elementary Arabic II

Special Studies
This course is to help students further their studies and proficiency at the elementary level with the four skills of modern standard Arabic: writing, reading, listening and speaking. Upon completion of this course, students should be able to:
• Write and memorize the Arabic alphabets and marking system.
• Read and pronounce the Arabic sounds correctly.
• Take dictation and apply short and long vowels appropriately.
• Apply basic grammatical structure in writing.
• Converse about oneself, family and other social and cultural situations.
• Produce appropriate dialogue for cultural and social settings.
Prereq. ARB 101
3 Credits 3 Weekly Lecture Hours

ARB 105 Technology Practicum III

• Describe the responsibility of the health unit coordinator.
• Describe the responsibilities of the health unit coordinator.
• Describe the job responsibility of the health unit coordinator.
• Become socialized to new facility environment to aid in role transformation from student to graduate.
Coreq. AHS 200
6 Credits 24 Weekly Laboratory Hours

(ARC) Architecture

ARC 121 Architectural Graphics I
An introduction to the fundamentals of drafting for architectural construction, the course is primarily directed at developing construction documentation skills with a review of light frame construction materials and methods.

The course begins with instruction in the application of basic hand sketching and computer-aided drafting skills and the fundamental principles of graphic delineation. It leads students through the development of a set of residential construction documents. Included is an overview of reprographic techniques for the use of related office equipment such as the Diazo whiteprinter and electrostatic copier.

Upon successful completion of the course, students should be able to:
• Demonstrate familiarity with reprographic techniques for basic office equipment and processes used in construction documentation.
• Select appropriate light frame, residential construction material and assemblies in response to a schematic architectural design.
• Solve design development problems, given a preliminary design concept, involving issues of space function and layout, construction detail and aesthetics.
• Prepare graphic documentation, using computer assisted drafting, to communicate a residential design concept to the contractor.
Prereq. TCS 100 Coreq. TCC 122
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

ARC 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

ARC 215 Architectural Design Concepts
This course presents fundamentals of the architectural design process and the graphic techniques, both manual sketching and CADD, for creating and presenting design ideas including a review of the types of problems and concerns that characterize design decisions. The course emphasizes the need to conceive and manipulate architecture as space.

Architectural programming is introduced along with conceptual diagramming techniques and development of preliminary plans. Design projects develop the ability to organize space in two- and three-dimensional contexts. Selected technical topics such as stairway design, complex roof intersections and egress requirements may be introduced.

Upon successful completion of this course, students should be able to:
• Select and manipulate, manually and with CADD, various drawing types that are used in analyzing and creating design solutions.
• Recognize and characterize spatial elements and concepts.
• Develop and utilize a set of space definitions and an architectural program.
• Analyze and document site opportunities and constraints.
• Develop a preliminary design concept from an organizational diagram.
• Complete a design development from a preliminary concept.
• Calculate or apply standard design performance measures.
Prereq. ARC 121
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

ARC 221 Architectural Graphics II
An advanced-level course in the graphic documentation of construction concepts using manual sketching and CADD techniques. Emphasis is placed on the development of working drawings for commercial buildings and site construction. Principles of materials and methods of construction are integrated into a project where the student is required to derive and document solutions to site development, structural, building envelope and finish-material systems.
Upon successful completion of this course, students should be able to:
- Make preliminary selection and sizing of structural components from standard load tables.
- Apply basic building code requirements to schematic design concepts.
- Develop details for major architectural systems and components.
- Analyze the overall design and details to accommodate the needs of working loads, weather, thermal shock, constructability, working tolerances and occupancy use.
- Complete a set of construction documents for a modest commercial structure using CADD systems.

**ART 100 Art and Child Development**

This course examines artistic development and expression in childhood. Emphasis will be on actual artistic production, the visual language of art including the principles of design and color and on issues of aesthetics and response strategies in relation to art criticism and art history. The cognitive developmental stages of artistic growth in childhood and psychomotor skills will serve as a foundation in preparation for curriculum planning. Upon successful completion of this course, students should be able to:
- Develop and apply techniques to motivate children of elementary school age to explore, discover, manipulate and create artworks in various art media reflective of their particular developmental stage.
- Distinguish basic principles of artistic design and color theory and to integrate these ideas into general curriculum planning and artistic production.
- Identify and describe a child's art production in stages of creative, emotional and mental growth.
- Analyze student/children's artwork according to aesthetic issues.
- Utilize a broad view of art historical content and how it relates to student/children's artwork.
- Produce a wide range of projects applicable to curriculum planning within the elementary school but based on the cognitive and motor skills indicative of a university-level student.

**ART 110 Art History I**

This course surveys the artistic styles from prehistoric art to the Proto-Renaissance. Painting, sculpture and architecture are studied as individuals works in relationship to their social and religious backgrounds. Issues concerning iconography and biography will also be a focus of this course.

Upon successful completion of this course, students should be able to:
- Analyze representative art of prehistoric Europe, Egypt, The Ancient Near East, The Aegean, Greece, Rome, Medieval Europe and the Proto-Renaissance in Europe. Explain the techniques used in the painting, sculpture and architecture of the period.
- Define the technical terms associated with the description of art.
- Identify stylistic changes affected by geography, politics and religion.
- Visually identify stylistic differentiation of any work(s) from the above time periods.

**ART 111 Art History II**

This course surveys the artistic styles from the Renaissance through the 21st Century. Painting, sculpture and architecture are studied as individual works in relationship to their social and religious backgrounds. Issues concerning iconography and biography will also be a focus of this course.

Upon successful completion of this course, students should be able to:
- Analyze representative art of the Renaissance, Baroque, Rococo, Neo-Classical, Romantic, Realist, Impressionist, Post-Impressionist and Expressionist periods. The many "isms" of 20th Century Art as well as the art of the 21st Century Post-Modern Era will also be covered in this class. Explain the techniques used in painting, sculpture and architecture of the period.
- Define the technical terms associated with the description of art.
- Identify stylistic changes affected by geography, politics and religion.
- Visually identify stylistic differentiation of any work(s) from the above time periods.

**ART 120 Drawing I**

This course is an introduction to drawing in a variety of media and subject matter including still life. Discussion and demonstration will augment studio work.

Upon successful completion of this course students should be able to:
- Demonstrate ability to draw what is seen incorporating the basic properties of line, figure-ground relationship, value and texture.
- Diagram perspective.
- Demonstrate the ability to activate the concept of the picture plane.
- Produce cohesive composition.
- Create the illusion of three-dimensional forms and space on a two-dimensional plane.

**May be repeated with Dept approval**

3 Credits 3 Weekly Lecture Hours

**ART 140 Painting**

This is a primary studio course in acrylic painting with instruction in the use of brush and palette knife. Introductory demonstrations will be given in still life painting.

Upon successful completion of this course, students should be able to:
- Prepare the materials for the process of painting.
- Demonstrate knowledge and understanding of the 12-hue color wheel.
- Demonstrate the ability to activate the concept of the picture plane.
- Produce cohesive composition.
- Demonstrate the ability to analyze how light creates form with the interplay of hue, value and chroma.
- Create the illusion of three-dimensional forms and space on a two-dimensional plane.

3 Credits 3 Weekly Lecture Hours

**ART 145 Watercolor Painting**

This course is an introduction to the basic tools and techniques of the watercolor painter. Emphasis is placed upon transparent watercolor within the Western tradition in still life, landscape, figure and non-objective subject matter.

Upon successful completion of this course, students should be able to:
- Prepare the materials for the process of painting.
- Demonstrate knowledge and understanding of the 12-hue color wheel.
- Demonstrate the ability to activate the concept of the picture plane.
- Produce cohesive composition.
- Apply the wash, glazing, graduated wash, wet into wet, lifting, scraping, resist, drops and splatter, and drybrush techniques within a watercolor painting.
- This course may be repeated for credit with departmental approval.

3 Credits 3 Weekly Lecture Hours

**ART 160 Black and White Photography I**

This course is designed to introduce students to the basics of picture taking and picture making. Topics include use of 35mm camera and lens, film processing, printing and photochemistry. Two-hour photolabs will provide practical darkroom experience.

Upon successful completion of this course, students should be able to:
- Identity and apply camera handling and cleaning techniques.
- Define and describe characteristics of black and white films and print papers.
- Calculate correct photographic exposures under a variety of lighting conditions.
- Describe and apply basic principles of photographic composition.
- Apply principles governing use of contrast filters.
- Describe and apply the technical and aesthetic criteria by which photographs are evaluated.
- Prepare a portfolio of black and white enlargement prints that exhibit effective focus, depth of field, contrast, cropping and display.

Need 35mm camera with adjustable settings

3 Credits 3 Weekly Lecture Hours
ART 166 Black and White Digital Negative
This course is a continuation of Black and White Photography I. Students learn more about the art of photography by exploring advanced approaches to composition, lighting and printing. Using photochemistry and setting up a home darkroom are among the topics covered. Students will have the opportunity to learn about the advanced changes offered through the use of digital darkroom techniques.

Upon successful completion of the course, students should be able to:
- Integrate knowledge of conventional analog into digital photography techniques.
- Use contrast control, light enhancement, and simple line, mass, movement and form.
- Use studio light meters to calculate correct flash, fill and main lighting exposure values.
- Control basic composition and design elements including subject-background relationships, brightness ratios, contrast, line, mass, movement and form.
- Define, describe and apply principles of commercial studio photography.
- Use basic four-light artificial lighting set ups in portrait and still modeling.
- Use studio light meters to calculate correct flash, fill and main lighting exposure values.
- Control basic composition and design elements including subject-background relationships, brightness ratios, contrast, line, mass, movement and form.

Preq. ART 160 or equivalent.

3 Credits 3 Weekly Lecture Hours

ART 167 Black and White Digital Negative
This course is a continuation of Black and White Digital Negative. Students will learn the art of conventional printing using enlarged negatives. Students will have the opportunity to learn the advanced changes offered to them through the use of digital photography, bridging the technological gap between traditional methods and rapidly changing digital methods in photography. The course is not intended to abandon traditional methods of photography, but to incorporate the technology. This course will not involve the use of digital cameras. The course will use computers to enlarge black and white negatives for contact printing.

Upon successful completion of the course, students should be able to:
- Integrate knowledge of conventional analog into digital photography techniques.
- Use contrast control, light enhancement, and simple line, mass, movement and form.
- Understand and bridge the gap from conventional analog to digital photography.
- Comprehend the importance of scanning for digital negative resolution.
- Practice and enhance images for fine art color printing.
- Use dodging, burning, sharpening, masking, and contrast controls.
- Use storage and transfer media for file compression.
- Use contrast control, light enhancement, and simple color correction.

Preq. ART 161 and 166 or equivalent.

3 Credits 3 Weekly Lecture Hours

ART 169 Medium and Large Format Photography
This studio and field course is an introduction to techniques, including use of medium- and large-format cameras. The course teaches practical, hands-on approaches to the design and production of high-quality photographs. The use of studio lighting and cameras is provided. Assignments include portraiture, photographing glassware, silver and industrial products, architecture and macro photography. Emphasis is on studio rather than darkroom experience, though students will develop and contact print their negatives.

Upon successful completion of this course, students should be able to:
- Arrange and light objects using tent lighting and studio light tables.
- Use basic tilt and swing movements to render correctly perspective and depth of field.
- Define, describe and apply principles of commercial studio photography.
- Apply large-format camera work to representative commercial studio subject matter.
- Define, describe and apply principles of commercial studio photography.
- Use basic four-light artificial lighting set ups in portrait and still modeling.
- Use studio light meters to calculate correct flash, fill and main lighting exposure values.
- Control basic composition and design elements including subject-background relationships, brightness ratios, contrast, line, mass, movement and form.

Preq. ART 160 or equivalent.

3 Credits 3 Weekly Lecture Hours

ART 168 and 169 Medium and Large Format Photography
This course is a continuation of Black and White Digital Negative. Students will learn the art of conventional printing using enlarged negatives. Students will have the opportunity to learn about the advanced changes offered to them through the use of digital photography, bridging the technological gap between traditional methods and rapidly changing digital methods in photography. The course is not intended to abandon traditional methods of photography, but to incorporate the technology. This course will not involve the use of digital cameras. The course will use computers to enlarge black and white negatives for contact printing.

Upon successful completion of the course, students should be able to:
- Integrate knowledge of conventional analog into digital photography techniques.
- Use contrast control, light enhancement, and simple line, mass, movement and form.
- Use studio light meters to calculate correct flash, fill and main lighting exposure values.
- Control basic composition and design elements including subject-background relationships, brightness ratios, contrast, line, mass, movement and form.

Preq. ART 160 or equivalent.

3 Credits 3 Weekly Lecture Hours

ART 169 Medium and Large Format Photography
This studio and field course is an introduction to techniques, including use of medium- and large-format cameras. The course teaches practical, hands-on approaches to the design and production of high-quality photographs. The use of studio lighting and cameras is provided. Assignments include portraiture, photographing glassware, silver and industrial products, architecture and macro photography. Emphasis is on studio rather than darkroom experience, though students will develop and contact print their negatives.

Upon successful completion of this course, students should be able to:
- Arrange and light objects using tent lighting and studio light tables.
- Use basic tilt and swing movements to render correctly perspective and depth of field.
- Define, describe and apply principles of commercial studio photography.
- Apply large-format camera work to representative commercial studio subject matter.
- Use basic four-light artificial lighting set ups in portrait and still modeling.
- Use studio light meters to calculate correct flash, fill and main lighting exposure values.
- Control basic composition and design elements including subject-background relationships, brightness ratios, contrast, line, mass, movement and form.

Preq. ART 160 or equivalent.

3 Credits 3 Weekly Lecture Hours

ART 175 Color Digital Printing Special Studies
This course is an exploration into the art of color digital photographic printing. The course will incorporate the use of traditional color slides and negative films, with the final process completed through the digital darkroom workflow and techniques. Students will learn about the correct exposure of color slides and negative films for calibration and how to balance color through the use of color correction filters in the field. The use of color as a design element in the photographic medium and the fine art of digital color printing techniques will be emphasized.

Students will have the opportunity to learn about the advanced changes offered through the use of digital photography. This course will enable students to effectively and efficiently use and understand a digital workflow design for high quality color photographic printing. Upon successful completion of this course, students should be able to:
- Use a service bureau for output production of enlarged negatives for printing.
- Produce a portfolio of prints incorporating the use of digital negatives.
- Use computer software for image enhancement.

Preq. ART 161 and GRA 211.

Must have 35mm camera

3 Credits 3 Weekly Lecture Hours

ART 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the "Options for Earning College Credit" section of the catalog.

(AUT) Auto Mechanics

AUT 100 Introduction to Automotive Service Operation and Shop Practices
This introductory course is designed to provide the student with knowledge and skill in automotive service operations and shop practices. The student will interact with various automotive service organizations, dealerships, and independent service and repair contractors. Proper handling, parts departments, job classifications, training for a career in the automotive service and repair industry, and other automotive business related topics will be addressed. This course presents instruction in automotive terminology, use of service manuals, diagnostic equipment, use of shop tools, hand tools, and power tools in relation to shop practices and safety. Accident prevention practices, first aid tools and equipment, and personal environmental safety practices and procedures will be stressed throughout the course. In addition, an overview of the automotive engines system, its major components, delivery units, preventive maintenance, and basic mathematics will be covered.

Upon successful completion of this course, students should be able to:
- Demonstrate personal and environmental safety practices.
- Apply basic first aid procedures. Identify tool and equipment nomenclature.
- Apply and utilize tool safety regulations.
- Explain Occupational Safety and Health Act (OSHA).
- Utilize service manuals/electronic media.
- Identify all data informational systems.
- Perform basic mathematical calculations.
- Identify the major components of the automobile.
- Perform calculations using the metric system.

2 Credits 1 Weekly Lecture Hour
2 Weekly Laboratory Hours

AUT 101 Automotive Electricity and Electronics
This course is designed to prepare the student to work in the field of electricity and electronics as it relates to the modern automobile. The course covers concepts in basic electricity, electrical terms, electrical circuits, and electronic systems protection. The student will be introduced to various types of batteries such as deep cycle batteries and hybrid batteries, their design, maintenance, size, selection, factors affecting the battery’s life, safety procedures, testing, charging, and jump-starting. Emphasis will be placed on the ignition system, its design, components, control circuits, testing, disassembly and assembly. The course is also designed to provide the student with a basic understanding of present and future developments in sophisticated automotive electronics. In addition, indicator systems, pollution control systems and other modern automotive accessory systems will be addressed.

Upon successful completion of this course, students should be able to:
- Perform electronic pollution controls testing, service and repair requirements. Identify basic electronic circuits used in the modern automobile.
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• Identify system defects and troubleshooting procedures.
• Utilize various techniques to adjust electronic ignition systems.
• Recognize electronic braking systems.
• Test, service, and repair various systems according to requirements.
• Identify indicators and gauges.
• Repair power operated cruise control. Install warning, security, and sound systems.
• Identify electronically controlled trip computers, and digital indicator systems. Troubleshoot warning, and warning indicators.

Prereq. AUIT 100
4 Credits 2 Weekly Lecture Hours 4 Weekly Laboratory Hours

AUIT 102 Automotive Engines

This course is designed to provide the student with the fundamental theory, construction, inspection, measurement, performance, and identification of the automobile’s engine. Integrating theory and practical application in the lab is stressed throughout the course. The course covers topics such as preparing the engine for removal, lifting, disassembly, assembly, and inspection, as well as identifying, diagnosing, and evaluating engine parts. The student will gain skill in analyzing defects and the proper process to administer specific maintenance requirements. In addition, the student will be exposed to concepts in cylinder block reconditioning, crankshaft inspection and measurements, piston rings inspection, renewal, and installation.

Upon successful completion of this course, students should be able to:
• Prepare engines for removal.
• Disassemble, inspect, and clean engine parts. Install bearing, pistons, piston rings, and crankshaft.
• Assemble the cylinder head.
• Remove the camshaft.
• Install timing components, gears chain, and belts.
• Inspect and service oil pumps.
• Inspect aluminum cylinder heads; combustion chamber, and intake exhaust valves.
• Follow valves reconditioning guide for valve seats, and valve stem seals.
• Adjust hydraulic and manual valve clearance.
• Lubricate and test cooling system.
• Inspect air induction system and exhaust system components.
• Service turbochargers and superchargers.
• Utilize torque wrench and its components.
• Thread and repair gaskets and their sealing properties.
• Use adhesives, sealant and other sealing materials.
• Reassemble engine and install engine in the vehicle.
• Perform crankshaft inspection measurements.

Prereq. AUIT 100
4 Credits 2 Weekly Lecture Hours 4 Weekly Laboratory Hours

AUIT 103 Brake Systems

This course is designed to introduce students to the principles of hydraulic brake systems and their components. The course will emphasize how to analyze and repair domestic and foreign brake systems to include shoe, disc, hydraulic, vacuum and air brake systems. Instruction will include principles of hydraulic brake systems, its components, hydraulic system safety switches and valves, master cylinder operation, as well as inspection, machining, fitting, and adjustments of brake systems. Measurements required for brakes, rotors, brake lining, and brake-balding procedures will be addressed. Mathematical calculation requirements and the use of digital readout units will be covered. In addition, diagnostic testing of disc brake components and functions, two and four wheel equipped disc brakes, general caliper inspection and service, rotor inspection and service, various antilock brake systems, ABS components and systems, automatic traction control and stability will be thoroughly presented.

Upon successful completion of this course, students should be able to:
• Identify hydraulic brake systems.
• Repair brake components and systems.
• Perform inspection, measurement and machining procedures.
• Diagnose, service and repair antilock brake systems and automated traction control.
• Service and repair four-wheel disc brake systems.
• Identify principles of hydraulic brake systems and components.
• Identify drum and disc brake assemblies.
• Diagnose and service brake drum and rotor components.
• Perform rotor inspection service and measurements.
• Diagnose and repair antilock brake systems for two wheel and four-wheel units.

Prereq. AUIT 100
4 Credits 2 Weekly Lecture Hours 4 Weekly Laboratory Hours

AUIT 114 Steering and Suspension

This course is designed as an introduction to tire descriptions, wheels, tires repairs, measurements, wheel run out, tires and wheels service, and wheel bearings. The course provides the student with methods of analyzing defects and the necessary preventive or corrective maintenance requirements. Tire wear patterns and remedies will be thoroughly covered. Emphasis will be placed on McPherson Strut Systems, independent suspension systems, general front suspension inspection, and repair. Topics such as electronically controlled suspension, manual steering systems, power steering systems, electrically controlled power steering systems, and steering system diagnosis will be covered. Visual inspection, four-wheel steering systems, alignment geometry, pre-alignment inspection, wheel alignment equipment, and alignment machines will also be presented.

Upon successful completion of this course, students should be able to:
• Identify tire descriptions and usage.
• Perform service on tires and wheels, wheel bearings, front and rear from tapered to roller.
• Identify tire wear patterns and remedies.
• Repair frames, suspension system components, and McPherson Strut Systems.
• Inspect and service front suspension components.
• Repair rear, independent, semi-independent, and live-axle rear suspension systems.
• Perform two- and four-wheel alignment procedures.
• Utilize alignment machines.

Prereq. AUIT 100
4 Credits 2 Weekly Lecture Hours 4 Weekly Laboratory Hours

AUIT 115 Fuel and l

This course introduces the student to gasoline and diesel fuels with emphasis on fuel performance, delivery systems, pumps, and fuel lines in major domestic and foreign automotive fuel systems. The course includes carburetor design, basic carburetor circuits, and various types of carburetors. It also covers fuel injection systems, fuel lines, and fuel pumps, detailed inspection processes, and fuel tanks. The course also includes a complete diagnostic troubleshooting process, and an overall factory adjustment procedure of all major carburetor and fuel injection systems.

Upon successful completion of this course, students should be able to:
• Demonstrate safety in handling fuels.
• Evaluate uses of alternative fuels.
• Identify fuel delivery systems for gasoline and diesel engines.
• Determine alcohol and/or water levels in fuel tests.
• Identify fuel systems pressure, relief, and fuel filters.
• Identify the sources of technical data for automotive fuel systems.

• Discuss diesel fuel injection systems for passenger cars.
• Operate and service hydraulic and mechanically controlled fuel injection systems. Explain the operation/service of electronically controlled fuel injection systems. Determine methods to analyze defects.
• Identify the fuel injection systems defects.
• Diagnose carburetor circuits and electronic control.
• Service carbureters and their related components.
• Evaluate basic carburetor designs, basic carburetor circuits, types of carbureters, updraft, side draft, and downdraft.
• Identify manifold vacuum, ported vacuum, venturi vacuum and their relationship to fuel injection systems.

Prereq. AUIT 100
4 Credits 2 Weekly Lecture Hours 4 Weekly Laboratory Hours

AUIT 121 Engine Performance

This course is designed to provide the student with theory, design, construction, inspection, and service of the automotive engine. The purpose of the course is to review engine operation and performance, the creation of vacuum during engine operation, comparison of engine vacuum to low voltages use with vehicle engine management computer. Concepts such as computer programming, diagnosing, and troubleshooting internal circuit boards will be presented. The purpose and operation of critical sensors in fuel economy, emission control and electronic spark timing will also be presented. Catalytic converters, their purpose in controlling exhaust gas emission and the use of two or more O2 sensors will also be covered. Case studies of the vehicle engine, spark and fuel malfunctions, the use of scan tools, AC and DC test instruments, and dynamometer operation to simulate on-road conditions will be explored. Moreover, the use of OBD (On-Board Diagnostics) to determine malfunctions within the overall engine fuel and electronic management parameters will also be reviewed. Hands on skills to determine malfunctions in the operation of the modern vehicle in real life scenarios will be practiced.

Upon successful completion of this course, students should be able to:
• Identify engine operation and performance, vacuums, and electronic devices.
• Perform computer programming.
• Process malfunction retrieval of diagnostic trouble codes.
• Test sensors and activators performance.
• Define the relationship of fuel management to electronic engine control.
• Utilize scan tools.
• Repair emission control and electronic spark timing.
• Utilize exhaust dynamometer operation to simulate on-road conditions.
• Recognize internal circuits malfunctions.
• Identify results using two or more O2 sensors.
• Define operation of exhaust analyzers and dynamometers.
• Solve case studies describing malfunctions of engine parts.
• Apply AC and DC test instruments.
• Define OBD.
• Determine malfunctions within the overall engine fuel and electronic management parameters.

Prereq. AUIT 100
3 Credits 1 Weekly Lecture Hour 4 Weekly Laboratory Hours

AUIT 123 Power Train Controls

This course is designed to expose the student to the design, service, and diagnosis of automotive computer power train controls in automotive transmissions. Shifting, transfer case shifting, four-wheel drive and all-wheel drive shifting as well as shift feel diagnostics, and linkage adjustments will be covered. Emphasis will be placed on diagnostic and troubleshooting malfunctions and diagnostic and troubleshooting electronically controlled transmission/transaxles. Hands-on experience will be
gained by utilizing electronic meters to retrieve malfunction trouble codes from the vehicle's computer. Factory/aftermarket scanner tools will be utilized to determine or retrieve malfunction trouble codes within the transmission/transaxle units.

Upon successful completion of this course, students should be able to:
- Prepare a list of electronically controlled unit cases.
- Diagnose and troubleshoot electronically controlled units.
- Demonstrate electronically controlled 4-wheel drive and all-wheel drive units. Service electronically controlled transfer case units.
- Troubleshoot the unit's malfunctions.
- Utilize factory/aftermarket scanner tools to retrieve malfunction trouble codes. Disassemble, repair, and replace electronic sensors.
- Locate oil pressure controlled switches.
- Reassemble electronic sensors and test for proper operation.

PreReq. AUT 101
2 Credits 1 Weekly Lecture Hour 2 Weekly Laboratory Hours

AUT 150 Air Conditioning

This course is designed to provide the student with theory and skill in the design, operation, diagnostic, repair, and service procedures of the automotive heating and air conditioning combinations, individual controls, and refrigerants used in air conditioning systems. Manual and automatic operations of systems, basic and advanced control systems, and computer controlled air conditioning systems will be discussed. In addition, temperature controls systems, refrigerant control systems; proper maintenance procedures, and recommendations will also be addressed. Topics such as electrical, electronic diagnosis, troubleshooting, retrofitting R-12 systems to R-134A, and utilizing proper antifreeze protection will also be covered.

Upon successful completion of this course, students should be able to:
- Demonstrate safety and caution with refrigerants.
- Obtain EPA (Environmental Protection Agency) certification.
- Handle approved refrigerants.
- Diagnose heating and air conditioning system failures.
- Diagnose and repair electric and electronic systems.
- Discharge, evacuate, and repair various systems.
- Repair and change various systems.
- Drain, flush and refill cooling systems.
- Operate combustion and individual controls.
- Identify refrigerants to be used in A/C systems.
- Apply basic and advanced control systems.
- Recommend maintenance procedures.
- Operate manual and automatic systems.

PreReq. AUT 100
2 Credits 1 Weekly Lecture Hour 2 Weekly Laboratory Hours

AUT 151 Ignition Systems

This course is designed to provide the student with a foundation in theory and skill in the field of ignition systems. Basic, primary and secondary circuits, ignition timing, spark timing systems, and the components and operation of the ignition system will be discussed. Visual inspection of components, wiring, and no-start diagnosis and general ignition system testing as well as the scope and effects of incorrect ignition timing will be included. Theory and practical application in the laboratory will be stressed.

Upon successful completion of this course, students should be able to:
- Define the purpose of the ignition system.
- Demonstrate safety, caution and proper use of tools.
- Install high voltage secondary wiring.
- Diagnose and troubleshoot primary and secondary ignition systems.
- Troubleshoot distributor equipped and direct sparks ignition systems.
- Diagnose primary and secondary distributor service ignition control systems.
- Diagnose and repair no start problems.
- Adjust ignition timing on engines.

PreReq. AUT 101
2 Credits 1 Weekly Lecture Hour 2 Weekly Laboratory Hours

AUT 152 Computer and Emissions Systems

This course is designed to provide the student with theory and skill in the design, repair, service, and testing procedures of emission systems, and drivability problems. Electronic service precautions, computer outputs, primary sensors, monitoring capabilities, OBD (On-Board Diagnostics) systems and terms will be covered thoroughly. The use of various types of computers in diagnostic systems, such as retrieving trouble codes, diagnosing computer voltage supply, and ground wires will be presented. The student will also be prepared to test input sensors, actuator sensors, variable resistor type sensors, generate sensors, and test various computer circuits in the modern day automobile. The legislative history of emission controls, pollutants, evaporative emission control systems, PVC emission control system, exhaust emission control system, EGR (Exhaust, Gas, and Recirculation) systems, catalytic converter systems, troubleshooting and diagnosing emission systems, and engine management by computer systems will be thoroughly covered.

Upon successful completion of this course, students should be able to:
- Explain computer operation, circuits, and design. Define OBD (On-Board Diagnostics) terms.
- Utilize testing tools to retrieve malfunction codes from the computer.
- Identify the importance of emission controls and emission control procedures.
- Interpret electronic service precautions.
- Perform basic diagnosis.
- Explain computer outputs and actuators.
- Retrieve trouble codes from various types of computers.
- Test input sensors and actuator sensors.
- Explain exhaust emission control system.
- Define EGR (Exhaust, Gas and Recirculation) systems.
- Troubleshoot and diagnose emission systems.
- Maintain control of emission and engine management by the computer.

PreReq. AUT 100
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

AUT 200 Automotive Automatic Transmission/Transaxle

This course is designed to provide the student with theory and skill in the design, construction, inspection, repair, and diagnostic testing of the automatic transmission/ transaxle. The student will be prepared to perform diagnostic procedures during the evaluation of the component’s operation to determine if minor or major repairs are required to bring the automatic transmission/transaxle units back to manufacturer's specifications. In addition, processes to disassemble, measure, inspect, and reassemble automatic transmission/transaxle units correctly will be stressed. Electronic controls, hydraulic systems, locking and unlocking hubs, and operational modes will be discussed. Emphasis will be placed on serving four-wheel drive and all-wheel drive systems, transmission clutches, automatic transmission/transaxle maintenance, oil, and filter change procedures will also be covered. Hands-on procedures will be stressed throughout the course. Upon successful completion of this course, students should be able to:
- Demonstrate cautions and safety.
- Evaluate torque converters, bearings, bushings, and thrust washers.
- Disassemble, measure, and assemble units.
- Measure and install new parts as required.
- Differentiate between 4-wheel drive and all-wheel drive.
- Evaluate transfer cases, their operation, service, and maintenance.
- Service 4-wheel drive and all-wheel drive vehicles.
- Identify hydraulic systems.
- Lock and unlock hubs.
- Change transmission fluids and determine their proper usage in various manufacturers' units.
- Apply proper procedures for oil and filter change.
- Remove, overhaul and re-install transmission/transaxle in vehicles.
- Adjust units back to manufacturer's specifications.

PreReq. AUT 100
4 Credits 2 Weekly Lecture Hours 4 Weekly Laboratory Hours

AUT 201 Automotive Chassis and Security Systems

This course is designed to expose the student to the chassis and many security systems used on today's modern vehicles. This course will prepare the student to diagnose, wire, troubleshoot, remove, and install components in a safe and efficient manner. In addition, topics such as air bag restraint systems; front, side, and roof units restraint systems; conventional seat belts and roofline slider belts will be addressed. Moreover, radio and speaker installations, automatic vehicle leveling systems, and proper wiring for anti-theft device installation systems will also be covered. Upon successful completion of this course, students should be able to:
- Test chassis and security systems.
- Define air bag restraint systems.
- Remove and service air bag systems.
- Prevent deployment of air bag systems.
• Demonstrate precaution during the disconnecting of air bags for servicing.
• Repair restraint systems using conventional seat belts and roofline slider belts.
• Inspect belt webbing and anchor locations.
• Install belt webbing and anchor locations.
• Recognize delayed lighting and running lamps.
• Install and repair automatic locks, security and anti-theft devices.
• Perform appropriate wiring for anti-theft-device installation.
• Install radios, CD tape players, and speakers systems.
• Replace and repair electronic heat grids on rear windows.
• Utilize automatic vehicle leveling systems.
• Utilize the wiring diagram and computer.
• Install automatic built in security systems.
• Adjust chassis.
• Troubleshoot chassis operation.

BIO 100   Biological Science

This course explores the following aspects of biology: the organization of life, the development of living organisms, the transmission of traits, evolution, behavior and ecology. This course is intended for the non-science major. It should not be taken in conjunction with BIO 110 or BIO 111.

Upon successful completion of this course, students should be able to:
• Analyze the characteristics of life as currently understood on terra firma.
• Relate the life characteristics to the simplest level of existence: the single cell.
• Describe various patterns of reproduction among plants and animals.
• Evaluate various techniques of population control.
• Explain the mechanism by which traits are transmitted from parent to offspring.
• Summarize the causes and effects of various types of mutations.
• Trace the history of the modern concept of evolution.
• Survey the system of classification of plants and animals.
• Interpret behavior as an illustration of the modern concept of evolution.
• Relate the sources and the effects of pollutants to the quality of the environment.
• Demonstrate an understanding of laboratory experiments as they relate to the biological concepts presented in the above competencies.
• Formulate applications of biological concepts to one’s lifestyle and/or interests through integration activities.

Prereq. REA 050

2 Credits  1 Weekly Lecture Hour  2 Weekly Laboratory Hours

BIO 110   Introductory Biology I

Introductory Biology I is designed for majors in biology, natural science, and related fields. This course introduces students to the general principles of biology, emphasizing cell structure and function, molecular biology, genetics, and evolution. Students are expected to develop skills in utilizing the scientific method as a tool for problem solving.

Upon successful completion of this course, students should be able to:
• Utilize the scientific method to solve problems.
• Describe the chemical structure of biological molecules.
• Relate molecular structure to biological function.
• Describe prokaryotic and eukaryotic cell structure.
• Relate cellular structure to cell function.
• Explain the processes by which living systems convert solar energy to usable chemical energy.

BIO 111   Introductory Biology II

Introductory Biology II is designed for majors in biology, natural science, and related fields. This course focuses on the structure, function, and diversity of organisms with an emphasis on their evolutionary and ecological relationships. Upon successful completion of this course, students should be able to:
• Relate taxonomic classification to biological evolution.
• Describe patterns and processes of embryological development in animals.
• Relate structure to function in animal organs systems.
• Relate reproductive patterns to classification of the major phyla of plants.
• Characterize the features of selected organisms in the Kingdom Fungi.
• Demonstrate the polyphyletic nature of the Kingdom Protista.
• Characterize the evolutionary and ecological significance of bacteria.
• Discuss the impact of viruses on organisms.
• Interpret the ecological significance of organisms within various taxa.
• Access, interpret, and evaluate peer-reviewed primary scientific literature.
• Demonstrate an ability to utilize modern biology laboratory skills.

Prereq. BIO 110

4 Credits  3 Weekly Lecture Hours  2 Weekly Laboratory Hours

BIO 115   Field Ecology

Field Ecology is designed primarily for majors in biology, natural science, and related fields. This course focuses on the structure, function, and diversity of organisms with an emphasis on their evolutionary and ecological relationships. Upon successful completion of this course, students should be able to:
• Apply the learned chemical concepts to the study of physiology.
• Analyze the structural and functional aspects of a cell and its interactions with the environment.
• Describe the ultrastructure of skeletal muscle and the mechanism of muscular contraction.
• Analyze the mechanism responsible for the nerve impulse, the role of the autonomic nervous system in the maintenance of homeostasis and the perception of sensation.
• Demonstrate an understanding of cardiovascular physiology.
• Demonstrate an understanding of pulmonary physiology.
• Analyze the physiological changes that occur in the gastrointestinal tract during the digestion of nutrients.
• Analyze how the urinary organs function in the removal of cellular waste products from the blood and transport these wastes from the body.
• Demonstrate an understanding of the role of fluids, the movement of ions and acid-base balance in maintaining homeostasis of the body.
• Relate hormonal regulation to the physiology of the male and female reproductive organs.

Prereq. BIO 117

4 Credits  3 Weekly Lecture Hours  2 Weekly Laboratory Hours

BIO 119   Co-op/Internship

Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

BIO 200   General Zoology

A survey of the major invertebrate and vertebrate phyla including evolution within, biological contributions, basic structure, physiology and behavior of representatives of each subgroup.

This course is designed for science majors who, upon successful completion, should be able to:
• Prepare independently a research project in which the problem, background, procedure, apparatus and evaluation are thoroughly outlined.
• Trace the development of life on the earth from the primitive atmosphere components through the initial heterotrophs.
• Describe the taxa, behavior, biological contributions, characteristic systems and evolution in the invertebrate phyla.
• Describe the taxa, behavior, biological contributions, characteristic systems and evolution in the higher metazoans excluding insects (Annelida, Mollusca and Arthropoda).

BIO 117   Human Anatomy

• The microscopic and macroscopic study of the human body. The laboratory includes a study of the gross and histologic structures of certain vertebrates, with emphasis on the cat. Dissection is required.

Upon successful completion of this course, students should be able to:
• Describe the anatomical parts of the body as a whole.
• Discuss the structure of the body using the systematic approach: integumentary, skeletal, muscular, nervous, cardiovascular, respiratory, digestive, urinary, reproductive and endocrine systems.

Prereq. MAT 040 and REA 050

4 Credits  3 Weekly Lecture Hours  2 Weekly Laboratory Hours

BIO 118   Human Physiology

The study of the functions of the human body. Emphasis is placed on the interaction of the organ systems in the maintenance of body homeostasis. The lab will center around experiments on living vertebrates.

Upon satisfactory completion of this course, students should be able to:
• Apply the learned chemical concepts to the study of physiology.
• Analyze the structural and functional aspects of a cell and its interactions with the environment.
• Describe the ultrastructure of skeletal muscle and the mechanism of muscular contraction.
• Analyze the mechanism responsible for the nerve impulse, the role of the autonomic nervous system in the maintenance of homeostasis and the perception of sensation.
• Demonstrate an understanding of cardiovascular physiology.
• Demonstrate an understanding of pulmonary physiology.
• Analyze the physiological changes that occur in the gastrointestinal tract during the digestion of nutrients.
• Analyze how the urinary organs function in the removal of cellular waste products from the blood and transport these wastes from the body.
• Demonstrate an understanding of the role of fluids, the movement of ions and acid-base balance in maintaining homeostasis of the body.
• Relate hormonal regulation to the physiology of the male and female reproductive organs.

Prereq. BIO 117

4 Credits  3 Weekly Lecture Hours  2 Weekly Laboratory Hours

BIO 199   Co-op/Internship

Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.
BIO 220 Microbiology
Microbiology is designed to examine the biology of microorganisms and their significance to human existence. Cellular structures, metabolic pathways and lifestyle strategies will be studied. The role of microorganisms in disease, genetic engineering, and the environment will be covered. This course is designed for students in the Science for the Health Professions and Natural Science curricula. Upon successful completion of this course, students should be able to:
• Examine the evolutionary relationships between microorganisms and macroorganisms.
• Describe the cellular biology of single-celled organisms.
• Analyze the impact of microorganisms on humans.
• Analyze the lifestyle strategies of various bacterial cells.
• Apply the standard techniques for the study of microorganisms in the laboratory.
• Apply standard laboratory skills to identify unknown bacteria.
• Describe the properties of the genetic material in bacteria and viruses.
• Explain the role of microorganisms in genetic engineering.
• Examine the role of microorganisms in disease.
• Describe the various strategies used for control of infectious disease.
Prereq. BIO 110 or BIO 117
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

BUS 100 Introduction to Business
This course introduces business and non-business majors to the business world. Emphasis is on terminology used in business. Students explore careers in business along with the events and economic conditions that affect business. Among the topics studied are the Business in a global environment, the various forms of business, the social responsibility of business and the functions of accounting, marketing, management, and human resource management. The role of technology in business is also explored. Upon successful completion of this course, the student should be able to:
• Explore the various careers in business.
• Explain current events and economic conditions and how they influence business.
• Compare and contrast the various forms of business.
• Describe the strategic role of marketing.
• Explain the importance of ethical behavior, social responsibility and diversity in Business.
• Investigate the use of technology in business.
• Explain the function of accounting and finance in the business decision-making process.
• Discuss the functions of management.
• Discuss the role of human resource management.
• Define globalization and identify its impact on the business environment.
Prereq. ENG 050, REA 050 and MAT 040
3 Credits 3 Weekly Lecture Hours

BUS 101 Introduction to International Business
This course details practical terminology, concepts, associations, relationships and issues that are unique to business operations in the international sector. Its focus is on general consideration for businesses operating simultaneously in many different and constantly changing environments.
Upon successful completion of this course, the student should be able to:
• Discuss the historical growth of international trade.
• Distinguish between the major international trade theories.
• Determine what types of trading assistance international organizations offer.
• Explain the rationale for the international monetary system and how it affects exports/imports.
• Assess the physical and political forces that shape the foreign environment.
• Identify the necessary economic analyses that should be completed before trading or investing in another country.
• Discuss the various export practices and procedures.
• Examine East-West trade and its effect on economic relations.
3 Credits 3 Weekly Lecture Hours

BUS 102 Introduction to E-Commerce
This introductory e-commerce course is designed to provide students with a basic understanding of what e-commerce is, how the Internet is changing the way business is conducted globally and how corporations are using the Internet to improve effectiveness of an organization’s goals. The course defines e-commerce and related terminology, examines the relationships between consumers and business services on-line and looks at how business is conducted on the Web. Additional topics include what is involved in developing a Web site and an exploration of customer relationship management. The ethical, political and legal issues concerning proper conduct on the Internet are also discussed. The course is designed for students interested in electronic commerce and/or using computer technology in a business environment. It is a hands-on course using selected individual and team exercises on the Internet and other business computer technologies.
Upon successful completion of this course, students should be able to:
• Define e-commerce and related terminology.
• Discuss the global impact of e-commerce.
• Give examples of what businesses can gain from a presence on the Internet.
• Identify how the Internet and e-commerce are affecting the structure and activities of organizations.
• Identify different personal and business Internet Information Services on line.
• Discuss ethical, political and legal issues concerning proper conduct on the Internet.
• Identify different phases of doing business on the Web.
• Explain the use of e-commerce in a business-to-business (B2B) setting.
• Give examples of how corporations are using the Internet to increase revenues and improve internal and external communications.
• Demonstrate how e-commerce can improve the effectiveness of organizational goals.
Prereq. ENG 050, REA 050, MAT 040 and DPR 100
3 Credits 3 Weekly Lecture Hours

BUS 105 Introduction to Entrepreneurship
This class is an introduction entrepreneurial class for students interested in starting their own business. The ultimate goal of the class is to improve management, leadership, accounting and overall business skills and knowledge base for our entrepreneur students.
Upon successful completion of this course, students should be able to:
• Read and understand entrepreneurial terminology.
• Take, analyze, and assess personal self-assessment indicators measuring personal qualities best suited to being an entrepreneur.
• Define ethics and understand why ethics are important in small business. Describe the different structures of business ownership.
• Understand small business marketing, product and pricing strategies.
BUS 106 Entrepreneurship Seminar
The main objective of this course is to provide the student with an understanding of the problems and challenges facing an entrepreneur in the process of creating a business plan and seeking investors. Students are required to write a business plan and formally present their business plan. To facilitate the writing of the business plan, the plan will be discussed and completed in sections. Multiple iterations of the business plan will be submitted for feedback and refinement.
Upon successful completion of this course, students should be able to:
- Write a complete Business Plan
- Prepare and deliver an oral presentation on the Business Plan
- Develop a strategic financial plan to obtain financing

Prerequisites/Co-requisites: Satisfactory score on the English and Reading placement test or successful completion of Developmental English (ENG 050) and Developmental Reading and Study Skills (REA 050).

3 Credits 3 Weekly Lecture Hours

BUS 107 Value Investing - Special Studies
This course introduces adult learners to the concepts and practice of building wealth and income by investing in publicly traded companies. Emphasis is placed on the generating of a secondary stream of income, separate from wages, as a vehicle for creating long-term financial security and prosperity. The course examines the most proven method for individual investors, Value Investing. The course focuses on the process of selecting, analyzing, and purchasing long-term positions in dividend paying stocks.
Upon successful completion of this course, students should be able to:
- Learn to read Cash Flows, Income Statements, and Balance Sheets
- Calculate key ratios from statistics researched online
- Compare companies within industries for financial strength and long-term prospects
- Develop an intellectual framework for approaching investment decisions
- Read SEC filings including 10K Annual Reports to discern important risks and opportunities not apparent from the key statistics
- Create an investment plan and determine realistic goals
- Select initial target companies for acquisition
- Understand the value and mechanism of DRIP's (Dividend Reinvestment Plans)
- Build a personal tracking system, investment journal, to establish and measure investment criteria before and after purchasing a stock
- Study the importance of compounding, tax deferment, reinvestment, and retained earnings
- Perform case studies on actual investment opportunities and explain reasoning to other potential investors in the class
- Select and acquire an initial investment

Prerequisites/Co-requisites: Satisfactory score on the English, Mathematics, and Reading placement tests or successful completion of Developmental English (ENG 050), Developmental Reading and Study Skills (REA 050), and Basic Mathematics (MAT 040).
Prereq. ENG 050, REA 050, MAT 040

3 Credits 3 Weekly Lecture Hours

BUS 110 Sales and Sales Supervision
This course provides a middle-management approach to sales as a function of the marketing process. Emphasis in the course is on theory and basic techniques of selling.
Students are required to prepare and execute a formal sales presentation. Upon successful completion of this course, students should be able to:
- Discuss the world of the salesperson, his/her needs, problems and accomplishments
- Develop interpersonal skills for successful lifetime use
- Employ techniques that enable a salesperson to sell a product or service
- Analyze the pressures of attempting to influence the buying habits of another person through personal interaction
- Construct a written sales proposal based on customer needs
- Apply various modes of communication to build effective business relationships
- Analyze the legal, social and ethical implications of persuasive forms of business communications
- Manage time and territory constraints
- Prepare and execute a formal sales presentation

Prereq. ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours

BUS 111 International Management
This course will provide an overview of the external political, cultural and economic forces operating on the practice of management in the multinational firm. In addition, the internal management will be examined to provide an understanding of both the functional areas and the overall management.
Upon successful completion of this course, students should be able to:
- Investigate special problems confronting international managers
- Discuss the differences among international managers
- Explain how sociocultural differences affect business
- Determine the major legal and financial problems that might affect business
- Analyze the available labor pool
- Examine planning and organizational global functions
- Discuss the unique international control and staffing considerations

Coreq. ENG 100

3 Credits 3 Weekly Lecture Hours

BUS 130 Business Communication
This course focuses on the special needs of written and oral communication skills in the world of business. Emphasis is on the writing of letters, memos and reports, keeping a calendar, and researching business topics via the computer. The preparation of oral reports and presentation skills is also stressed. Upon successful completion of this course, students should be able to:
- Identify the fundamentals of communication theory and their relationship to business communication
- Apply the principles of effective communication to business situations that use memos, letters, proposals, and reports
- Organize business messages that are logical, complete, concise, grammatically correct, customer centered
- Electronically create business letters that respond to an inquiry, place an order, solicit a request, sell a product, adjust a billing, seek credit, respond to a claim, make collection on an account, and prepare a resume and cover letter
- Research business topics using the Internet and other sources and prepare a report
- Prepare and deliver an oral presentation on a business topic
- Conduct effective business meeting centering on a prepared agenda

Prereq. ENG 100 and DPR 100

3 Credits 3 Weekly Lecture Hours

BUS 149 Small Business Management
This course is designed to introduce students to the many facets of the small business from an entrepreneurial point of view. Small business managers and owners need a variety of exposure covering the entire span of operations and management. General concepts are reviewed to give students an introductory background in the world of small business. When the course is concluded, students should have the basic knowledge to make judgments as to further study necessary for their particular small business endeavor.
Upon successful completion of this course, students should also be able to:
- Use management skills in the areas of personnel, merchandising, budgeting and control
- Describe possible solutions to problems in the areas of strategic planning and management
- Assess the values and limitations of various financial opportunities
- Discuss the internal and external operations of a small business
- Conduct an audit and account for cash through managerial financial statements
- Analyze the implications of distribution systems for the small business
- Apply personnel management strategies
- Develop an awareness of the role of small business management in our social system

3 Credits 3 Weekly Lecture Hours

BUS 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

3 Credits 3 Weekly Lecture Hours

BUS 210 Principles of Management
This course is designed to present the functions and responsibilities of middle-management positions.
Upon successful completion of this course, students should be able to:
- Review the historical development of management theories and relate them to current management thought
- Use the planning process to accomplish both personal and organizational goals
- Explain the importance of and the procedure for organizing the workplace and defining tasks, responsibilities and relationships
- Describe the staffing process of recruitment, placement, training and development of organization members
- Identify the leadership and motivational traits and qualities necessary to accomplish organizational goals
- Discuss the tools and techniques used in the control process
- Analyze the decision-making and problem-solving methods that managers use
- Assess how the social, technological, economic and political/legal forces affect managers

Prereq. ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours

BUS 211 Supervision
The major thrust of the course is the supervisor's relationship to employees at the first-level of management in day-to-day operations. It is an introductory approach to the understanding of basic skills and activities and skills required to supervise these workers effectively.
Upon successful completion of this course, students should be able to:
- Identify the supervisor's role in the work organization
- Apply the principles involved in planning, delegating, motivating, leading and communicating
- Use techniques necessary for successful supervision, including those involved in staffing, training, compensating, evaluating and discipline

3 Credits 3 Weekly Lecture Hours
BUS 212 Introduction to Sport Management
This course explores the sport industry environment and introduces classic business and management concepts as they apply to this specific setting. Students are exposed to planning organizing leading and controlling strategies and skills with special emphasis on how they are applied in an organization operating within the demanding context of modern sports industry.

Upon successful completion of this course a student should be able to:
• Discuss the management skills functions and approaches applicable to a sports industry.
• Describe the sport industry environment from global ethical and social perspectives.
• Apply the decision making process within the sports industry including definition goal setting evaluating alternatives and implementation.
• Verbalize the strategic planning process as it applies to the sports industry.
• Articulate the key strategies utilized in event, facility, time and scheduling management.
• Describe organizational design and function as it applies to the development of an innovative, flexible and diverse internal culture.
• Enumerate the legal, social, collaborative and motivational aspects of human resource management within a sporting environment.
• Describe the application of management control tactics to promote quality, productivity and integrity within a sports organization.

3 Credits 3 Weekly Lecture Hours

BUS 214 Organizational Behavior
An introduction to the study of human behavior in organizations, the purpose of this course is to increase the student’s understanding and awareness of individual, interpersonal, group and organizational activities and events, as well as to increase the ability to explain and manage such events. The course emphasizes principles, concepts and theories applicable to organizations of any type. Such knowledge will help students develop skills to manage successfully and influence today’s workers, teams and organizations.

Upon successful completion of this course, the student should be able to:
• Explain the organizational and social environments within which managers manage.
• Analyze the role managers play in contributing to organizational success. Demonstrate organizational and interpersonal skills needed by managers to function successfully.
• Explain the factors that determine an individual’s personality and his or her relationship to job performance.
• Explain how perception affects the decision-making process.
• Describe the relationship among individuals values, attitudes, behavior, and job satisfaction.
• Apply the major theories of motivation.
• Identify the key factors in explaining group behavior.
• Explain the reasons for the growing popularity of teams in organizations.
• Explain the importance of leadership and communication skills to effective management of people.
• Discuss the effects of power and politics on organizational behavior.
• Define the common characteristics making up an organization culture.
• Discuss the forces that affect change in organizations and the ways of managing individual and organizational resistance to change.
• Analyze the role managers play in contributing to organizational success.

3 Credits 3 Weekly Lecture Hours

BUS 215 Human Resource Management
This course presents an in-depth study of the principles of human resource management. The course presents both the theoretical and practical aspects of the broad human resource functions which managers must understand in order to develop an effective and productive workforce. Computer simulations and exercises are used to introduce students to the practical aspects of human resource management.

Upon successful completion of this course, students should be able to:
• Explain the increasingly important role of human resource management in today’s modern organization.
• Describe the major personnel functions.
• Identify the explain the provisions of the major laws and regulations that influence human resource management.
• Explain Equal Employment Opportunity and Affirmative Action programs.
• Describe the interaction between business planning and human resource planning.
• Define corporate culture and describe the factors that interact to affect corporate culture.
• Explain the various types of corporate culture.
• Explain the collective bargaining process and describe a sound union-management relations program.
• Describe an effective performance appraisal system and identify the important dimensions of performance that should be evaluated.
• List the major theories of motivation and explain the central components of each theory.
• Explain the importance of training and development in maintaining and developing an effective workforce.
• Define the three types of compensation and explain how they tie to the organizational strategy.
• Define a benefit and explain why benefits are important to both employees and employers.
• Use a Human Resource Information System (HRIS) to perform selected human resource activities.

Prereq: DPR 100

3 Credits 3 Weekly Lecture Hours

BUS 216 Training & Development
This course introduces students to the importance of training and development in today’s organizations. As more organizations restructure and initiate strategic changes, training and development becomes more important. Training and development programs range from improving employee productivity to leadership development. The course focuses on training and development as an integrated strategic system comprised of the assessment of training needs, design and implementation of the training program, and evaluation. The legal and ethical considerations of training will also be discussed.

Upon successful completion of this course, students should be able to:
• Describe the components of an open system training and development model.
• Explain the roles and expectations of training and development to an organization.
• Describe the benefits of using a human resource development perspective in strategy development.
• Identify the major factors in employee performance and their relationship to training.
• Describe the steps in a training needs assessment.
• Apply the principles derived from learning theory to design a training session and program.
• Describe the methods and the cost/benefits of evaluating training programs.
• Discuss the advantages and disadvantages of the different training methods.
• Describe the importance of management development programs and how they are influenced by changes in organizational strategy.

3 Credits 3 Weekly Lecture Hours

BUS 217 Compensation & Benefits
This course is an introduction to compensation and benefits issues in today’s organizations. It is a practical approach to the systems, methods and procedures to establishing and managing an organizational compensation program. The course provides students with the concepts, principles and theories used in the design and implementation of compensation systems in all types of organizations. Compensation and benefits systems will be discussed as a means to effective recruitment, motivation and retention.

Upon successful completion of this course, students should be able to:
• Explain the different compensation philosophies used in organizations.
• Describe the behavioral considerations affecting compensation and benefits.
• Discuss the legal issues involved in compensation and benefits administration.
• Outline the process used in building a compensation system.
• Explain the job evaluation process and discuss the methods used in performing a job evaluation.
• Discuss methods of conducting and analyzing market pay surveys.
• Discuss the various ways of establishing a pay-for-performance system.
• Explain the importance of health-care, security, and retirement benefits.
• Discuss benefits communications and flexible benefits considerations in benefits administration.

3 Credits 3 Weekly Lecture Hours

BUS 218 Labor Relations
For organizations to be successful today, the relationship between managers and employees must be handled effectively. Whether or not employees are represented by unions, issues such as employee health and safety, working conditions and security must be addressed. This course will discuss the development and application of policies and procedures in addressing employee rights issues. The course will focus on union/management relations in the union organizing, collective bargaining and grievance-arbitration processes. The course provides students with an understanding of the legal, ethical and practical issues in union/management relations.

Upon successful completion of this course, students should be able to:
• Explain employment-at-will and identify three exceptions to it.
• Discuss employee rights issues associated with access to employee records, free speech, workplace monitoring, investigations and drug testing.
• Discuss the stages in the unionization process.
• Apply the appropriate laws related to union/management relations.
• Identify labor relations strategies and how they affect operational and tactical labor relations.
• Describe the three major phases of union/management relations: union organizing, collective bargaining and contract administration.
• Discuss the rights, responsibilities and ethics of union/management relations.
• Apply conflict resolution practices and techniques in a work environment.
• Apply negotiation skills in work environment.

3 Credits 3 Weekly Lecture Hours

BUS 220  Elementary Statistics
This is an introductory course in statistics which will provide the basics needed to solve simple problems as well as provide the necessary foundation for inference and estimation.

Upon successful completion of this course, students should be able to:
• Define and calculate the mean, median, mode, range, variance and standard deviation for ungrouped and grouped data.
• Determine whether events are statistically independent, dependent or mutually exclusive.
• Calculate probabilities using the addition and multiplication rules.
• Calculate probabilities using the binomial, Poisson and normal probability distributions in practical problems.
• Calculate binomial probabilities using the Poisson and normal probability distributions as approximations.
• Demonstrate an understanding of the concepts of a sampling distribution and a sampling error.
• Construct and interpret confidence interval estimates for the population mean and/or population proportion.
• Formulate and test hypotheses about a population mean and/or a population proportion.

Prereq: MAT 100
3 Credits 3 Weekly Lecture Hours

BUS 225  Professional Development
This course is designed to promote critical thinking with regard to career preparation, career management and career development.

Upon successful completion of this course, students should be able to:
• Demonstrate a professional image.
• Identify and apply effective job-seeking skills.
• Identify characteristics associated with job success.
• Demonstrate effective business communication skills.
• Increase personal, professional, social and organizational effectiveness through improved communication.
• Develop goal-setting skills.
• Identify the characteristics of self-esteem.
• Identify the characteristics of leadership.
• Define work ethics.
• Discuss time, money and stress-management techniques.
• Define personal values.
• Demonstrate the ability to analyze and solve problems.
• Discuss courtesy and common-sense skills.
• Identify professional development skills.
• Demonstrate effective human-relations skills.
• Evaluate the implications of organizational dynamics.
• Apply correct guidelines for effective business travel.

Prep: ENG 050, REA 050, MAT 040
3 Credits 3 Weekly Lecture Hours

BUS 230  Principles of Marketing
This is a survey course designed to introduce students to the total marketing process. The nature and scope of marketing as it relates to managing profitable business in today's society will be examined. Study will include the various factors affecting this process such as product, price, promotion, place (distribution), the environment, international marketing, and consumerism.

Upon successful completion of this course, students should be able to:
• Describe the nature and scope of marketing.
• Identify the opportunities and constraints that exist in the firm's external environment.
• Determine the marketing manager's role in developing strategies and tactics aimed at achieving company goals.
• Analyze meaningful market segments and select target markets.
• Explore the value of gathering information for problem solving and decision making.
• Apply consumer-behavior principles to effective marketing activities.
• Develop and offer products (or services), including product-related factors, to provide customer satisfaction.
• Determine the channels of distribution as well as the number and kinds of channel intermediaries needed to get goods from the producer to the consumer.
• Establish the value to be given in exchange for goods or services.
• Utilize the tools of communication to develop and effectively share information between buyer and seller.
• Demonstrate an awareness of international marketing and social responsibility.

Prep: ACC 112
3 Credits 3 Weekly Lecture Hours

BUS 231  Principles of Advertising
This course is a detailed study of media usage for mass selling. Philosophy and psychology of radio, television, newspaper and other mass communications are covered. Practical applications of current advertising techniques will be developed.

Upon satisfactory completion of the course, students will be able to:
• Demonstrate a knowledge of the theories of mass communications and their effect on the public.
• Use verbal and written motivational means in reaching people.
• Possess a practical understanding of operational hands-on advertising and of advertising program planning.
• Choose appropriate media and develop advertising strategies.
• Have a working knowledge of budgeting for advertising in various size enterprises.
• Develop promotional plans that coordinate with overall business activity.
• Show knowledge of evaluation of advertising effectiveness.

Prep: ENG 050, REA 050, MAT 040
3 Credits 3 Weekly Lecture Hours

BUS 232  Principles of Finance
This course provides an examination of the goals of financial management within an analytical framework. Emphasis is given to techniques and methods used to manage the money supply for a business organization. Financial analysis and planning is explored. Techniques for managing working capital in a risk-return context are considered. Capital budgeting and related valuation concepts and long-term financing methods are included.

Upon successful completion of this course, students should be able to:
• State the goals and functions of financial management.
• Use financial ratios to evaluate chance for business success.
• Prepare projected statements for financial planning.
• Demonstrate how operating and financial leverage enables management to maximize profits.
• Determine optimum operating levels of working capital.
• Prepare calculations involving the time value of money to assist in making investment decisions.
• Measure financial risk through quantitative methods.
• Describe how financial managers decide to use debt and equity instruments for long-term financing.

Prep: ACC 112
3 Credits 3 Weekly Lecture Hours

BUS 233  Financial Planning
This course introduces business and non-business majors to the world of financial planning. Emphasis is placed on mastery of the terminology, concepts and calculations used in the business world. The course looks at investment decisions from both the view of a financial institution and the view of an investor. The course focuses on both short-term and long-term financial planning.

Upon successful completion of this course, students should be able to:
• Prepare a cash budget and determine cash flow position.
• Calculate gross pay, payroll deductions and net pay.
• Analyze the impact of taxes on asset/investment decisions.
• Maintain and reconcile savings and checking accounts.
• Analyze, lease or buy decisions for an automobile, housing or any other investment decision.
• Describe the concepts of managing credit.
• Identify common business terminology and calculate the premiums for insuring individuals for life, homeowners, health and automobile coverages.
• Analyze, develop and monitor an investment portfolio that includes but is not limited to stocks, bonds, real estate, mutual funds and futures.
• Develop a strategic financial plan for an individual's projected lifetime.
• Distinguish between investment opportunities for growth and income and explain how risk affects these concepts.
• Use present and future value tables.
• Discuss the principles of retirement and estate planning including concepts of wills, trusts and annuities.
• Discuss the tax implications of retirement and estate planning.

Prep: ENG 050, REA 050, MAT 040
3 Credits 3 Weekly Lecture Hours

BUS 234  Electronic Marketing
This course is designed to introduce students to the principles and concepts of electronic marketing.

Upon successful completion of this course, students should be able to:
• Describe the importance of e-marketing resources in business.
• Apply traditional marketing processes to e-commerce.
• Develop a marketing plan for an e-commerce business entity or organization.
• Analyze market segments and select target markets to be explored.
• Capture target market data, analyze data and recommend appropriate adjustments to the marketing mix to maximize revenues and profits.
• Describe opportunities available for business-to-business commerce, business-to-customer commerce, and customer-to-customer commerce.
• Identify the implications of e-marketing on the global economy.
• Design and manage a web site for an on-line marketer.
• Describe how a decision support system, enterprise resource system and an e-business solutions technology can provide guidance to management in making operational, tactical and strategic decisions.

Prep: ENG 050, REA 050, MAT 040
3 Credits 3 Weekly Lecture Hours

BUS 235  Supply Chain Management
This course focuses on the development, design and management of the supply chain.

Upon successful completion of this course, the student should be able to:
• Explain why an effective and efficient supply chain is critical to the success of a business.
• Configure a logistics network.
• Prepare accurate supply and demand forecasts for all members of a supply chain.
• Compare the advantages and disadvantages of centralized versus decentralized control.
• Describe the tactics and strategies employed to deal with international supply chain issues.
• Calculate the economic order size for all members of a supply chain.
• Analyze and quantify the effect of value-added services.
• Utilize supply chain information technology.
• Explain how to integrate suppliers and customers into new product development.

3 Credits 3 Weekly Lecture Hours

BUS 236 Principles of Sports Marketing
This course is designed to expose the student to fundamental concepts of marketing, emphasizing how those concepts are applied to the domestic sports industry as well as, internationally, the international market. The course will focus on the unique aspects of sport, such as its particular product and life cycle profiles, the sport consumer and the various marketing tools and strategies that can be utilized to successfully bring the product to market, specifically the classic marketing mix, as well as targeting, segmentation, program implementation and control. Upon successful completion of this course, the student should be able to:
• Articulate the role of strategic marketing with emphasis on the sports industry. Describe the unique aspects of the sports industry.
• Discuss the specific profiles and behaviors of the sport consumer.
• Articulate market appropriate techniques to create and position the sport product. Demonstrate a firm grasp of the ethics of sports marketing.
• Utilize effective communication techniques central to the marketing process. Develop an understanding of market research in a volatile environment.
• Establish the basics of customer satisfaction from an economic value perspective. Demonstrate comprehension of the role of the marketing manager in a sporting environment.
• Describe Sponsorship as a Sports Product.

3 Credits 3 Weekly Lecture Hours

BUS 241 Business Law I
This course examines in depth the basis of our legal system, including its organization and processes. The concept of property and property rights in the perspective of human rights are stressed as the foundation of legislative and judicial reasoning regarding business problems. Specific topics include the law of torts, the law of contracts and the law of sales.

Upon satisfactory completion of this course, students should be able to:
• Explain the origins of and the social purposes of the American legal system.
• Describe the prominent court systems, procedures and remedies (outcomes).
• Distinguish among the various ways law is made.
• Explain the nature of the civil liability arising from the more common torts and the defenses available for each.
• Distinguish valid from invalid contracts and explain the rights and liabilities of the parties in the case of invalid and breached contracts.
• Describe the requirements of validity of contracts for the sale of goods and explain the rights and liabilities of the parties, as well as their title and risk of loss arising from such contracts both when they are valid and executed and when they are invalid or breached.

3 Credits 3 Weekly Lecture Hours

BUS 243 Legal Environment of Business
This course examines the contemporary legal environment as it relates to business. Among the topics covered are the origins of law and the legal system; ethics and social responsibility of business; contracts and non-contractual injury; agency relationships; governmental regulations of trusts, securities, employment and the environment; the Uniform Commercial Code; and international law affecting business.

Upon successful completion of this course, students should be able to:
• Describe how our law is derived from common and statutory law, constitutional interpretation and administrative regulations.
• Identify the federal and state court systems, jurisdiction and functions.
• Discuss the ethical and social responsibility of business.
• Discuss contracts including the formulation, dissolution and remedies for breach.
• Examine non-contractual injury, including negligence, strict liability, intentional torts and business-related torts.
• Describe the agency relationship and other business organizations, such as partnerships and corporations.
• Discuss the government regulations of business as they pertain to anti-trust, securities, employment and the environment.
• Examine the Uniform Commercial Code with special emphasis on sales, personal property, commercial paper and secured transactions.
• Identify current legislation and trends in international law.

PreReq. ENG 100

3 Credits 3 Weekly Lecture Hours

BUS 246 Teamwork
This course addresses the use of teamwork in a business environment both to identify and to solve problems. The course will emphasize examples, role playing and exercises for group participation.

Upon successful completion of this course, students should be able to:
• Analyze group dynamics and group process, and suggest interventions to improve them.
• Explain how problem solving differs in a group setting.
• Practice the interpersonal skills needed for effective teamwork.
• Demonstrate conflict-management skills.
• Perform the roles of leader, facilitator and participant on teams.
• Identify the key aspects of effective meetings.
• Demonstrate effective meeting skills.
• List and compare the stages of team development.
• Contrast the different roles played by members of teams and meeting participants.
• Describe personal impact in teams and personal reactions to team interactions.
• Discuss the management of diversity on teams.
• Describe various applications of teamwork within unit-based, cross-functional, customer and vendor organizations.

3 Credits 3 Weekly Lecture Hours

BUS 298 Credit for Prior Learning

1 Credit

(CHE) Chemistry

CHE 105 Technical Chemistry
This course is intended primarily for students who are in the various technology programs. It is designed to provide an understanding of basic chemical principles that will allow the students to take their places as scientifically literate members of society and to work in their various occupations (such as plant operators in the petrochemical, food, or pharmaceutical industries, as well as public safety officers who must respond to incidents involving toxic and hazardous materials). The course will not involve detailed chemical calculations or advanced theoretical topics.

Upon successful completion of this course, students should be able to:
• Explain how the elements are used to form compounds
• Describe the fields of Organic & Inorganic Chemistry
• Describe the chemistry of fire and explain the process of extinguishment
• Describe the petroleum industry and explain the petroleum refining process
• Discuss the causes of air and water pollution and explain their consequences
• Select the materials to assess the safety of chemicals and describe the value of MSDS, the Merck Index, and other references

PreReq. MAT 060

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

CHE 106 Introduction to Chemistry
Credits for this course will count as a science elective at DCCC for all curricula except the natural science curriculum. This course may not be transferable for science majors.

This course is designed for but not limited to students who wish to take General Chemistry but have inadequate backgrounds.

Upon successful completion of this course, students should be able to:
• Use scientific notation to multiply and divide.
• Use an electronic calculator to multiply and divide.
• Measure the length, mass, volume and temperature of materials using the metric system.
• Recall common conversion factors in the metric system.
• Use dimensional analysis.
• Use significant figures.
• Draw graphs according to established criteria.
• Demonstrate laboratory skills by naming laboratory equipment and distinguishing among types of substances.
• Recall a simplified theory of atomic structure.
• Describe ionic and covalent bonds.
• Demonstrate an understanding of the mole concept.
• Calculate basic stoichiometric relationships.
• Complete calculations based on the gas laws.

PreReq. ENG 100

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

CHE 110 General Chemistry I
This course is designed for students majoring in science or engineering fields.

Upon successful completion of this course, students should be able to:
• Use the metric system as a tool for performing measurements of length, area, mass, volume, energy and amounts of substances in terms of moles.
• Identify and classify substances with regard to type, state, purity and modes of change.
• Usefully apply the knowledge of the periodicity of the elements toward the description of chemical bonding.
• Solve mathematical problems related to chemical change and the mole concept.
• Explain and illustrate, by example, a variety of conceptual models used in studying the structure and behavior of atoms, molecules, solids, liquids and gases.
• Demonstrate approved techniques in gravimetric and volumetric methods in the laboratory.

PreReq. MAT 100 or CHE 106

4 Credits 3 Weekly Lecture Hours 3 Weekly Laboratory Hours
CHE 111 General Chemistry II
This course is a continuation of General Chemistry I. Upon satisfactory completion of this course, students should be able to:
• Prepare solutions with specific concentration values.
• Understand and apply the colligative properties of solutions toward the solution of practical problems.
• Evaluate and apply modern theories of acids and bases, especially the concept of pH.
• Apply the principles of kinetics and equilibrium toward the productive handling of systems of weak electrolytes.
• Understand and use the principles of oxidation reduction, electrochemistry and thermodynamics in explaining why chemical reactions occur and what benefits or consequences may result.
• Apply the principles of nuclear chemistry to the solution of problems relevant to contemporary society.
Prereq. CHE 110
4 Credits

3 Weekly Lecture Hours
3 Weekly Laboratory Hours

CHE 200 Organic Chemistry I
An integrated study of carbon compounds with emphasis on structure, stereochemistry, reactions and synthesis. Laboratory work will emphasize record keeping, separation, purification and identification using chromatography.

Upon successful completion of this course, students should be able to:
• Describe the chemical bonding in organic compounds.
• Analyze the thermodynamic and kinetic relationship in organic reactions.
• Describe the physical properties, stereochemistry, preparation, reactions and multistep synthesis of hydrocarbons.
• Demonstrate laboratory procedures for record keeping, separation, purification and identification using chromatography.

Prereq. CHE 110
5 Credits

4 Weekly Lecture Hours
3 Weekly Laboratory Hours

CHE 201 Organic Chemistry II
The study of organic compounds containing oxygen and nitrogen. The structure, stereochemistry, reactions, and multistep synthesis of organic nitrogen and oxygen will be studied. Syntheses and instrumental analysis (IR and NMR) will be emphasized in the laboratory.

Upon successful completion of this course, students should be able to:
• Analyze organic compounds using spectroscopy.
• Explain elimination and substitution reactions.
• Describe the physical properties, stereochemistry, preparation, reactions and multistep synthesis of organic oxygen and nitrogen compounds.
• Describe the general characteristics of carbohydrates, lipids and proteins.
• Prepare compounds using complex syntheses.
• Demonstrate a knowledge of scientific references and an ability to search the scientific literature.

Prereq. CHE 200
5 Credits

4 Weekly Lecture Hours
3 Weekly Laboratory Hours

COMM 100 Introduction to Interpersonal Communication
Students are introduced to the basic theories of interpersonal communication and their practical applications. Students also develop insights into managing conflict while learning how to build, maintain, and even end relationships in a productive manner. Given the social nature of communication, this course emphasizes experiential learning. Students should expect to be regularly engaged in classroom discussions, activities, and exercises. Academic writing serves to integrate learning in the classroom and off-campus. Upon successful completion of this course, students should be able to:
• Recognize the function of human wants, needs, beliefs, and attitudes as they influence human communicative behavior.
• Understand the importance of effective communication in interpersonal, intergroup, and small group settings.
• Interact with two persons in and across a variety of face-to-face and mediated interactive contexts.
• Apply foundational interpersonal skills such as active listening, self-disclosure, and trust building into their daily lives.
• Understand the role of culture in human communicative behavior.
• Identify and manage the multiple visual, verbal and nonverbal messages that constitute communication.
• Identify and manage the interpersonal conflicts in professional, social, and personal relationships.

Prerequisites: Satisfactory scores on placement tests in English and Reading. or successful completion of Developmental English (ENG 050) and Developmental Reading and Study Skills (REA 050).
3 Credits

3 Weekly Lecture Hours

COMM 102 Communication Across Cultures Special Studies

Prereq. ENG 050 and REA 050 or pass test
3 Credits

3 Weekly Lecture Hours

COMM 104 Introduction to Mass Communication
This course introduces students to both the print and electronic media systems. Students will review the history of the mass media and explore career opportunities in this field. They will also study the techniques of media analysis and consider the effects of the various media on society.

Upon successful completion of this course, students should be able to:
• Identify the dynamics of effective group communication needed to maintain a small group.
• Identify and manage interpersonal conflicts in group settings.
• Recognize and identify differences in culture and communication styles as they apply to small group communication.
• Distinguish between defensive and supportive group communication climates.
• Recognize each of the following as they apply to small group communication: role, group goal, group norm, group cohesion, and feedback.
• Explain the principles necessary to lead a discussion or group meeting.
• Participate productively in small group contexts.

Prerequisite: Introduction to Interpersonal Communication (COMM 100) or consent of instructor.
3 Credits

3 Weekly Lecture Hours

COMM 111 Public Speaking
This course enables students to speak before and in large and small groups. The course seeks to introduce students to the problems involved in providing information and persuading others. Organizational and research skills are stressed. Students can expect to present a minimum of five speeches.

Upon successful completion of this course, students should be able to:
• Define the concepts of "listener/audience needs."
• Speak extemporaneously (with or no a minimum of notes), using effective voice, language and bodily action.
• Locate appropriate materials (library, research, newspaper, journal, periodical, nonprofit media, interviews) for the public-speaking occasion.
• Organize ideas, opinions, facts, data requests into a message that will promote the desired response from the listeners.
• Present a variety of public messages: information, persuasion, entertainment/alter dinner/solicitation/inquiry/stimulation and analysis.
• Evaluate a as a speaker, allocate messages; being able to distinguish between an effective and noneffective message.

Prerequisite: Satisfactory scores on placement tests in English and Reading. or successful completion of Developmental English (ENG 050) and Developmental Reading and and Study Skills (REA 050).
3 Credits

3 Weekly Lecture Hours

COMM 115 Introduction to Public Relations
This course treats public relations as communication—the process of organizations relating to their various “publics.” Students explore the theory, principles and techniques of contemporary public relations as practiced in business, government, nonprofit and civic groups, cultural organizations, education and the community. Students prepare press releases, public service announcements, speeches, slide programs or other appropriate communication vehicles. For students in all curricula and programs.

Upon successful completion of this course, students should be able to:
• Describe public relations as a communication function of organizations.
• List 10 basic principles of effective public relations.
• Identify and describe career opportunities/possibilities within the student’s field of study, interests or aptitude area in public relations.
• Cite examples from the American past of public relations campaigns or principles that changed a “public’s” view of an organization, a movement, an institution or a tradition.
• Anticipate and analyze critical and negative views of public relations.
• Identify the use of communicative art forms such as music, poetry, art, dance, film or story telling, in any public relations campaign mounted by a significant American organization.
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• Use, where appropriate, contemporary technology such as desktop publishing or computer software or slide and sound show or photography or student-produced video in designing a public relations campaign on a contemporary American problem, organization or movement.

3 Credits 3 Weekly Lecture Hours

CPT 150 Introduction to Cabinetmaking
This course introduces basic cabinetmaking skills. Topics covered include material selection, layout, design, proper use and application of hand and power tools, and finishing techniques. Course includes the design and construction of various projects.

Upon successful completion of this course, students should be able to:
• Describe cabinet design considerations.
• Make basic sketches and layouts.
• Generate a Bill of Material for a project.
• Identify woods by sight.
• Discuss applications for woods.
• List applications for each wood species.
• Apply veneers.
• Affix plastic laminates.
• Select and apply different fasteners.
• Use hand and power tools safely.
• Make up various wood joints.
• Fabricate fixtures.
• Prepare a project for finishing.
• Apply finishes to wood.

2 Credits 1 Weekly Lecture Hour 2 Weekly Laboratory Hours

CPT 151 Furniture Building
This course presents the basic skills necessary to build furniture. Proper use of hand and power tools is covered. Wood joinery is covered along with different finishing techniques.

Upon successful completion of this course, students should be able to:
• Select wood for various applications.
• Make basic joints including mortise, tenon and dovetails.
• Demonstrate proper router applications.
• Perform proper clamping techniques.
• Apply finishes to achieve desired appearance.
• Utilize shop tools safely.

2 Credits 1 Weekly Lecture Hour 2 Weekly Laboratory Hours

CPT 152 Home Remodeling/Additions
Introduces basic principles of framing structures, insulation, paneling, ceramic tile for floors and walls, and basic carpentry skills. Topics covered include: stairs, roofing, basic plumbing and wiring, finishing work, skylights and windows and kitchens and bathrooms.

Upon successful completion of this course, students should be able to:
• Demonstrate proper applications of framing members including headers, beams, roof joist.
• Lay out a stairway.
• Apply ceramic tile with use of mastic or substrate.
• Explain the basic concepts involved of home wiring.
• Install a window into a new or existing opening.
• Solder 1/2” and 3/4” copper tubing.
• Construct a simple drainage branch using plastic pipe.

2 Credits 1 Weekly Lecture Hour 2 Weekly Laboratory Hours

CPT 153 Advanced Furniture Building
This course is designed for students who are ready to progress beyond The Basics of Furniture Building (CPT 151) course. It presents advanced techniques in wood bending using steam, laminate, freedom and coopering. The process of working with wood veneers and veneer inlays will be covered. Various methods in finishing and finishing materials will be emphasized.

Upon successful completion of this course, students should be able to:
• Select various types of wood for numerous application procedures
• Build, setup and operate a steaming device for bending wood
• Construct the appropriate form for bending procedures
• Use wood laminates for the purpose of bending
• Layout construction for coopering
• Apply various techniques for staining and finishing

2 Credits 1 Weekly Lecture Hour 2 Weekly Laboratory Hours

CPT 154 Introduction to Doors and Windows - Residential
This course is designed to provide the student with the fundamentals of various phases of door and window construction, installation, and finishing. Classroom instruction includes the proper use of measuring tools, blueprint reading, math skills, and arranging materials needed for finish carpentry applications. Lab instruction includes layout procedures, the proper use of hand and power tools to cut and shape wood, plastic and fiberglass. Identification of door and window hardware will also be presented. Tools such as chisels, planes, saws, drills, sanders will be utilized.

Upon successful completion of this course, students should be able to:
• Describe and identify various parts of doors and windows.
• Select the proper window and door sizes based on rough openings and manufacturers specifications.
• Install windows on “New” house construction, replacement windows, and additional window placement.
• Select various types of window glazing, glazing materials, and installing glass.
• Discuss the identification and applications of interior and exterior door and window casings.
• Construct and set door frames.
• Identify and install door and window hardware.

3 Credits 3 Weekly Lecture Hours

CPT 160 Introduction to Roofing and Siding
This course provides an introduction to roofing and siding processes. The course is designed to provide instruction in the commonalities of theory and skills associated with the installation of low maintenance exterior building products to residential structures. Roofing and siding types, materials, measurements, exterior insulation, trim and soffits, and identification of flash valleys, sidewalls, chimneys, as well as roof obstructions will be discussed. The proper use of powered and non-powered hand tools will be covered thoroughly. Materials including roofing felt, organic and fiberglass asphalt shingles, aluminum and vinyl siding will be introduced.

Upon successful completion of this course, students should be able to:
• Define roofing and siding terms.
• Describe and apply roofing felt, organic and/or fiberglass asphalt shingles and roll roofing.
• Describe and apply aluminum and vinyl siding.
• Identify flash valleys, sidewalls, chimneys, and other roof obstructions.
• Cut and bend roll aluminum to fit exterior trim and soffits.
• Apply and cut fakrode exterior insulation.
• Estimate needed roofing and siding materials.

4 Credits 2 Weekly Lecture Hours 4 Weekly Laboratory Hours

CPT 161 Introduction to Staircase & Balconies
This introductory course is designed to provide the student with a concentrated instruction method in staircases and balconies. The student will learn basic concepts which includes, stairway and balcony types, layouts, construction and terminology. Design concepts, platforms and landings, spiral staircases, and balcony
construction will be thoroughly presented. In addition, mathematical calculations will be used to determine proper tread rise and various carpentry measurements. Upon successful completion of this course, students should be able to:

- Identify various types of staircases and balconies and their terminology.
- Perform mathematical calculations to determine proper tread rise and run of a given staircase.
- Layout and fabricate plain, square cut, mitered and hosed stringers and stair horses.
- Layout and fabricate platforms and landings.
- Construct and install balusters, newels, and handrails.
- Fabricate and install balcony skirts.
- Utilize existing building codes to comply with code enforcement regulations.

CPT 162 Introduction to Interior Trim, Walls and Ceilings

This course is designed to introduce the student to the field of interior trim carpentry. The course presents the basic phases of drywall construction, ceiling applications, and interior trim processes. Topics covered include layout procedures, proper use of tape, corner beads, and drywall joint compound. In addition, ceiling construction, suspended ceilings, and ceiling tile trim will be presented. The process of measuring proper applications of moldings, and molding patterns will be covered.

Upon successful completion of this course, students should be able to:

- Describe various types, sizes, and uses of drywall panels.
- Describe hardware, adhesives, and applications of drywall.
- Make single and multi-ply drywall applications to interior walls and ceilings.
- Reinforce and conceal joints with tape and compound.
- Identify standard and crown moldings and their applications.
- Apply ceiling and wall moldings.
- Apply interior door casings, baseboard, base cap and base shoe.
- Install window trim, including stools, aprons, jamb extensions, casings, and stop beads.
- Layout and install suspended ceilings.
- Layout and install ceiling tile trim.

3 Credits  3 Weekly Lecture Hours  4 Weekly Laboratory Hours

CPT 200 Advanced Framing Design

This course provides instruction on advanced structural concepts. Topics covered include: identification of structural components, floor joists, ceiling joists, rafters, headers, window casings, door jambs and roof sheathing.

Upon successful completion of this course, students should be able to:

- Identify the structural components in construction.
- Construct partition framing.
- Install ceiling joists in a structure at the girdle and beams.
- Complete roof and exterior finishes.
- Utilize measurement tools correctly and accurately.
- Understand blueprint symbols and nomenclature.

Prereq: CPT 101

4 Credits  3 Weekly Lecture Hours  2 Weekly Laboratory Hours

CPT 260 Advanced Roofing and Siding

This course is designed for the student wishing to take the advanced level course in roofing and siding. This level presents various demonstrations of grades of wood shingles, shakes and terra cotta tile. Siding applications, cedar shakes, T 111 siding, brick, stone and stucco will be presented. Practical application of theoretical material covered in class is stressed throughout this course.

Upon successful completion of this course, students should be able to:

- Define advanced roofing and siding terms.
- Describe and apply wood shingles and shakes to roof underlayment.
- Flash hip-valley and ridge roofs according to specific application.
- Apply wood shingles and shakes to siding.
- Apply T 111 siding.
- Determine the uses and applications of brick, stone and stucco siding.
- Estimate required amounts of roofing and siding.

Prereq: CPT 160

4 Credits  2 Weekly Lecture Hours  4 Weekly Laboratory Hours

(DPR) Computer Information Systems

DPR 100 Introduction to Information Technology Special Studies

This introductory course introduces students to computer concepts and applications. Students are introduced to computer hardware, software, and operating systems. Also covered are the Internet, application software, databases, networks, computer security, mobile devices, software programming, IT privacy issues, and future trends in technology.

Upon successful completion of this course, students should be able to:

- Understand and describe the types of computers and their purposes.
- Understand and describe how the components of a computer system function (hardware and software).
- Understand and use operating system software.
- Understand and use productivity software such as Microsoft Office (Word, Excel, and PowerPoint, Access).
- Understand the concept of computer programming, examples include IM, Wiki, Blog, E-Portfolio.
- Understand and describe databases.
- Understand the legal and privacy issues concerning information technology.
- Demonstrate the use of the internet for research.
- Use technology as an effective communicator tool.

3 Credits  3 Weekly Lecture Hours

DPR 105 Management Information Systems

This introductory course in managing information systems defines business processes, integrates these processes with computer technology, explains the flow of information in a business, and examines the use of information in business management. Business topics are integrated with information systems concepts. The course is designed for students using computer technology in a business environment. This course provides a real world process-oriented component to business education. Selected exercises using MS Office, MIS software, and business simulation games on the Internet are used in this course.

Upon successful completion of this program, the student will be able to:

- Explain what a business information system is and identify key components.
- Outline the phases and steps in the information system development process.
- Define business and computer technology terminology.
- Give examples of how business information systems can break time, geographic, cost, and structural barriers in business.
- Identify how business information systems are affecting the structure and activities of organizations.
- Diagram typical flows of information in business operations.
- Examine specific ethical principles of conduct and apply an ethical analysis to a difficult business information systems situation.
- Identify business software tools that complete word processing, prepare spreadsheets, perform research, design databases, and prepare presentations.
- Demonstrate a fundamental knowledge of how business processes and computer technology improve effectiveness of organizational goals.
- Explain how information systems can improve management decision-making effectiveness.

3 Credits  3 Weekly Lecture Hours
DPR 107 Helpdesk Concepts
This course provides students with a practical introduction to Help Desk concepts. Topics covered include the different types of help desks and how they are measured by organizations; the roles and skills required to function in a Help Desk environment; and the processes and technologies commonly employed to ensure the Help Desk is operating efficiently and effectively.

Upon successful completion of this course, students should be able to:
• Discuss the components of a successful Help Desk.
• Discuss the emerging support center concepts.
• Distinguish between the different types of Help Desks, such as centralized, decentralized, internal, external.
• Use required business and technical skills.
• Discuss job responsibilities of Help Desk personnel.
• Discuss Help Desk processes and procedures.
• Apply the technological aspects of the Help Desk.
• Apply the informational aspects of the Help Desk.

Prereq. DPR 100
3 Credits 3 Weekly Lecture Hours

DPR 108 Introduction to Computer Science
This is an introductory course intended to prepare students for courses in computer programming. The purpose of the course is to teach students the fundamentals of designing, developing and testing computer programs. The C++ computer language is used to allow students to explore computer programming. This course is required before any computer programming courses can be taken.

Upon successful completion of this course, the student should be able to:
• Implement the major steps in the design and development of a computer program.
• Navigate through the C++ editor, compiler, and runtime environment.
• Explain and use data, operations, functions, and datatypes.
• Apply the correct control and iterative structures to a program.
• Demonstrate proficiency in PC file creation and in a GUI operating system.

Prereq. ENG 050, REA 050 and MAT 060
3 Credits 3 Weekly Lecture Hours

DPR 111 Advanced Microsoft Office
This is a hands-on course for a graphical interface application software package. The course is an advanced personal computer applications course using office software. Prior experience with a computer and an integrated office software package is required.

Upon successful completion of this course, students should be able to:
• Demonstrate an intermediate/advanced knowledge/skill with a graphical user interface.
• Demonstrate intermediate/advanced computer skills using office software on a personal computer.
• Apply intermediate word processing skills to solve application-type problems using word processing software.
• Apply intermediate mathematical skills to solve application-type problems using word processing software.
• Apply intermediate database skills to solve application-type problems using a database.

Prereq. DPR 100
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

DPR 113 Database Management Systems
This course provides students with an introduction to data base concepts, data models and Data Base Management SYSTEM (DBMS) software. The relational data base model is examined. One or more of the common DBMS software is included as part of the hands-on activities associated with the course.

Upon successful completion of this course, students should be able to:
• Discuss general concepts of computer data base systems.
• Understand data models through an intuitive approach to data base design.
• Recognize the standards for data base design and apply them to the data base design of a specified application.
• Identify the main features of a relational data base model.
• Design, develop and manipulate a rudimentary relational data base.

Prereq. DPR 100
4 Credits 3 Weekly Lecture Hours 1 Weekly Laboratory Hour

DPR 114 Microsoft Word
This course is designed to develop students’ word processing skills on the microcomputer using Microsoft Word for Windows. Basic, intermediate and advanced features of MS Word are stressed.

Upon successful completion of this course, students should be able to:
• Create, save, retrieve and print documents.
• Identify word-shortcut commands and function keys using the WORD Keyboard Template.
• Identify the various parts of the Word screen.
• Edit documents by use of insert and delete functions.
• Select and use character formatting features including all caps, bold, italic, underlining, double underlining, and line spacing, indenting and changing the case of letters.
• Enhance business memorandums and letters by changing the alignment, indents and line spacing of paragraphs as well as creating numbered and bulleted paragraphs.
• Manage documents by creating folders, copying, renaming, deleting and printing documents.
• Enhance the visual display of text in documents by changing the font.
• Apply formatting effects to text such as strikethrough, superscript, subscript, small caps and hidden text.
• Use writing tools by completing a spelling check on text in a document, improving the grammar of text in a document using the grammar checker, adding words to and deleting words from the AutoCorrect dialog box, displaying synonyms and antonyms for specific words using Thesaurus and displaying information about a document such as the number of pages, words, characters, paragraphs and lines.
• Manipulate the length of lines in business documents, create a document more quickly with the date and AutoText features, and improve the visual appeal with drop caps and nonbreaking spaces.
• Manipulate tabs in documents with tab settings including left, right, center and decimal.
• Control printing features for simple business documents and print envelopes and mailing labels.
• Format and merge separate files to create a series of similar business documents such as personalized form letters, envelopes and labels.

Prereq. DPR 100
3 Credits 3 Weekly Lecture Hours

DPR 115 Microsoft Excel
This hands-on course provides a comprehensive presentation of Microsoft Excel. The more advance features of Microsoft Excel are stressed.

Upon successful completion of this course, students should be able to:
• Develop Excel worksheets that include formulas and functions.
• Develop professional-looking worksheets using Excel.
• Develop charts and graphs.
• Manage financial data using Excel.
• Create static and dynamic Web pages using Excel.
• Work with multiple worksheets and workbooks.
• Manipulate data with database functions, lookup function and templates.
• Enhance Excel worksheets with Visual Basic and Macros for applications.
• Demonstrate “What-If-Analysis” using Excel.
• Import data into Excel worksheets from other Microsoft applications.

Prereq. or Coreq. DPR 100
3 Credits 3 Weekly Lecture Hours

DPR 116 Internet Research
This course is designed to teach students effective research skills using the Internet. Students will learn effective research strategies for retrieving, evaluating and using information from Internet web sites, Internet-based subscription databases, online library catalogs and selected reference publications and monographs. The development of critical thinking skills for college level research assignments and lifelong learning will be stressed. Ethical and legal aspects regarding the use of information will be discussed. Upon successful completion of this course, the student should be able to:
• Distinguish free Internet sites from fee-based Internet subscription services.
• Use advanced features of Internet search engines.
• Evaluate web sites for reliability and relevancy.
• Choose the most effective resource and format for the specific information needed.
• Understand the legal and ethical issues regarding plagiarism and copyright.
• Compose a works cited list using MLA or APA format.
• Navigate services available through homepages of a public library and an academic library.

Coreq. DPR 100
3 Credits 3 Weekly Lecture Hours

DPR 141 UNIX Operating Systems
This hands-on course aims to familiarize students with the Unix operating system. The course covers the installation, use, management and customization of Unix in a PC environment. Topics include notable and commonly used Unix commands; the Unix shell as both user interface and programming environment; the Unix file system; the Unix networking subsystem; and bandwidth management under Unix.

Upon successful completion of this course, students should be able to:
• Discuss the features and benefits of the Unix operating system.
• Log onto and out of a Unix system.
• Discuss the Unix file naming convention.
• Construct both simple and enhanced Unix command lines.
• Describe and distinguish between the concepts of kernel, shell and file system.
• Discuss the file hierarchical structure.
• Employ both user- and administrator-oriented Unix commands in an effective manner.
• Identify the most significant characteristics of the Unix networking subsystem and Unix bandwidth management.
• Recognize and describe widely-used Unix applications such as Apache.

Prereq. DPR 108
3 Credits 3 Weekly Lecture Hours

DPR 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.
**DPR 205 Introduction to Java Programming**

This course teaches students how to create single user applications. Students learn the fundamentals of object-oriented programming by designing, coding and testing simple applications. The course is designed for students who have an understanding of programming methods and techniques using the Java programming language. Upon successful completion of this course, the student should be able to:

- Explain the fundamentals of Java programming.
- Create and use functions in a Java program.
- Demonstrate use of Java class libraries.
- Explore applet class.
- Demonstrate use of methods and method overloading.
- Explain and use the function of inheritance, derived and abstract classes. Demonstrate use of object-oriented programming techniques.

Prereq. DPR 108

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

**DPR 206 Programming for the Web**

In this course Web developers learn to add dynamic content and interactive elements to Web pages using scripting languages with an emphasis on PHP. Learn how to write and embed PHP into HTML. Design and relational database system using MySQL and connect to it using PHP. E-commerce issues such as user authentication, how to securely gather, transmit and store data will also be addressed.

Upon successful completion of this course, students should be able to:

- Describe scripting languages, their purpose and how to integrate them into HTML. Differenitate between Web scripting technologies such as JavaScript, Perl/CGI, ASP and PHP.
- Discuss the advantages and disadvantages of using various scripting languages. Write scripts using string, numeric, Boolean variable types, expressions and arithmetic operators.
- Write user-defined functions.
- Define and use objects, properties, methods and events.
- Incorporate conditional and repetition structures into scripts.
- Test and debug scripts.
- Design and create a relational database using MySQL.
- Add, edit, delete and search records in a MySQL database from the web with PHP.
- Describe e-commerce security issues.
- Implement user authentication with PHP and MySQL.
- Implement secure transactions with PHP and MySQL.

Prerequisites: IMM 120 Web Page Development and DPR 108 Introduction to Computer Science

Prereq. IMM 120, DPR 108

3 Credits 3 Weekly Lecture Hours

**DPR 207 Intro to Oracle:SQ**

This course introduces students to Oracle as a data base management system. Emphasis is on using SQL to query and update data in a database, create reports, and to embed SQL commands in a programming language.

Upon successful completion of this course, the student should be able to:

- Discuss the conceptual and physical aspects of relational database architecture.
- Write and execute SQL statements.
- Use the SQL editor.
- Use single row and group functions.
- Create tables and views.
- Produce output using SQL "Plus.
- Control user access.
- Write small PL/SQL programs.

Prereq. DPR 108

4 Credits 4 Weekly Lecture Hours

**DPR 209 PERL/CGI Programming**

This course introduces students to the concepts, techniques and syntax needed to write, debug and implement effective Perl programs and CGI scripts. Perl is presented both in general programming terms and in its role as the language most frequently used to exchange data between web clients and servers.

Upon successful completion of this course, students should be able to:

- Identify how Perl handles programming concepts such as arithmetical, relational and logical operators. Characterize conditional and iterative structures.
- Use data types including scalars, arrays and hashes.
- Identify and characterize modularity and system variables.
- Analyze problems in order to design Perl programs solutions.
- Create, test, debug and execute Perl programs.
- Evaluate programs in order to be able to optimize their effectiveness and efficiency.
- Under the role of a CGI script in creating interactive web sites.
- Provide users with customized data through the use of CGI scripts.
- Save data to a file and a database.
- Use Perl's string manipulation features including regular expressions.
- Create and use cookies.

Prerequisites: Introduction to Computer Science (DPR 108) and Web Page Development (IMM 120)

Prereq. DPR 108, IMM 120

3 Credits 3 Weekly Lecture Hours

**DPR 212 Data Structures & Algorithms**

This course focuses on problem analysis, algorithm design and refinement, and computer programming. Selection, loops, functions, parameter passing, arrays, and sorting and searching techniques are examined using C++. Software engineering methods and structured style and object oriented programming are emphasized. Upon successful completion of this course, the student should be able to:

- Discuss software engineering and develop programs using good programming style and object oriented programming techniques.
- Use simple and advanced data types including linked lists, stacks, queues, and trees.
- Analyze the efficiency of various algorithms for looping, recursion, sorting, and searching.
- Use abstract data types, containers and class templates, encapsulation, inheritance, and polymorphism.
- Evaluate simple systems concepts such as input/output buffers, parameter passing mechanisms, and memory management.

Prereq. MAT 131 or MAT 160 and DPR 226 or DPR 205

4 Credits 4 Weekly Lecture Hours

**DPR 220 Visual Basic Programming**

This course familiarizes students with ways to create single-user applications using Microsoft's Visual Basic (VB.NET) programming language. Students learn the fundamentals of Object Oriented Programming (OOPS) by designing, coding and testing simple Windows-based applications. The course is designed for students with an understanding of programming design and logic but who need to understand event-driven programming methods and techniques.

Upon successful completion of this course, students should be able to:

- Describe the differences between event-driven programs and procedure-driven programs.
- Define objects, properties, methods and events.
- Create applications that correctly declare and use variables, accept user input, use subs and functions, and use code loops and control structures.
- Locate and correct coding problems using de-bugging tools.

Prereq. DPR 108

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

**DPR 222 Object Oriented C++**

This course will teach students how to create single-user applications using Microsoft’s Visual C++ programming language. Students will learn the fundamentals of Object Oriented Programming (OOPS) by designing, coding and testing simple applications. This course is designed for students that have an understanding of programming design and logic but need to understand object oriented programming methods and techniques. This is NOT a Visual C++ course. Upon successful completion of this course, the student should be able to:

- Explain the fundamentals of C++ programming.
- Use a C++ compiler.
- Create and use functions, templates, and friends in a C++ program.
- Use C++ classes.
- Create and initialize objects.
- Explain and use inheritance and derived classes.
- Use operator functions and operator overloadig in a C++ Object Oriented program.
- Use Object Oriented Programming techniques.

Prereq. DPR 108 or DPR 205

4 Credits 3 Weekly Lecture Hours 1 Weekly Laboratory Hour

**DPR 227 Introduction to PC Support**

This is the first part of the hands-on hardware preparation for students whose goal is to develop an understanding of operating systems to maintain and manage a personal computer. The course prepares students to understand the terminology and technically support ports, motherboards, microprocessors, memory, interrupt requests, basic power needs, chips, cables, troubleshooting and Internet resource discovery both to find information and help in troubleshooting devices.

Upon successful completion of this course, the student should be able to:

- Identify the components of a typical microcomputer system.
- Demonstrate a knowledge of components such as ports, motherboards, microprocessors, memory, interrupt requests, basic power needs, chips, and cables.
- Troubleshoot the above devices using various techniques including Internet resources.
- Discuss error messages and their meanings.
- Install and support operating systems.
- Analyze conflicts and problems in both the hardware and software environment.

3 Credits 3 Weekly Lecture Hours

**DPR 228 PC Repair & Maintenance**

This course is a continuation of the hands-on course for students whose goal is to work with personal computer operating systems. The course prepares students to technically support personal computer repair and maintenance.

Upon successful completion of this course, the student should be able to:

- Apply knowledge of SCSI, IDE, and similar hard drive configurations.
- Locate and correct disk drive utilities.
- Apply knowledge of FDISK, SCANDISK, CHKDSK and other similar disk drive utilities.
- Construct configuration files for optimal computer performance.
DPR 232  Introduction to Computer Game Design and Development
This course is the introductory course to the computer game certificate program. It involves designing, developing and testing small 2D and 3D computer games using game development software tools. No programming experience is necessary. Upon successful completion of this course, the student should be able to:
• List requirements for a game development studio.
• Describe the basic elements of an image and how to manipulate it.
• Describe types of sounds and how to obtain or create sounds and music. Identify and describe game genres.
• Identify the elements of good game designing.
• Develop a 2D level game using Game Maker software.
• Develop a 3D level game using Game Maker software.
Prereq. DPR 100
3 Credits  3 Weekly Lecture Hours

DPR 234  Introduction to Computer Game Programming
This course teaches the students the concepts of programming using the C++ language and DirectX. This course will introduce students to C++, Object oriented Programming, as well as, DirectX and its components. Students will create 2D and 3D objects, program animation sequences, add sound effects to games, create virtual game world and program a full featured role-playing game.
Upon successful completion of this course, the student should be able to:
• Describe the elements of game programming.
• Create a Windows program.
• Create a DirectX program.
• Use points, vertices and graphic primitives.
• Use DirectX textures to create a texture surface.
• Create a DirectX animation program.
• Create and program sounds.
• Create a Role Playing Game (RPG) using DirectX.
4 Credits  3 Weekly Lecture Hours  1 Weekly Laboratory Hour

DPR 236  Game Art & Animation
The focus of this course is to create 2D artwork, 3D models, arrange UV’s, generate textures and create a 3D computer video game. The objective of this course is for students to demonstrate their ability to create 3D models using popular modeling software.
Upon successful completion of this course, the student should be able to:
• Identify the requirements of a 3D model.
• Identify the requirements of 2D artwork.
• Demonstrate the ability to organize, collect and prepare material for a 3D video game.
• Understand how to use a 3D modeling software product.
• Demonstrate the ability to design and develop a 2D artwork.
• Demonstrate computer animation techniques.
3 Credits  3 Weekly Lecture Hours

DPR 238  Game Design Theory & Practice
This course will give the student the theory and practical aspects of the entire game development process. Students will brainstorm a game idea, establish focus, determine the storytelling mode, analyze several games, and document the design and play testing scenarios.
Upon successful completion of this course, the student should be able to:
• Describe the computer video game development process.
• Identify the techniques of top game designers.
• Analyze and identify the elements that make successful games.
• Create design documents.
3 Credits  3 Weekly Lecture Hours

DPR 245  Game Portfolio
The focus of the Game Portfolio course is to design a game. This course is designed to help students develop a sense of their own identity as a designer and to promote a sense of personal responsibility in the creative process. The aim is to create a personal and professional portfolio that reflects the student’s understanding of the design process.
Upon successful completion of this course, students should be able to:
• Demonstrate a working knowledge of acting techniques and skills.
• Develop a portfolio of three or four projects that demonstrate the student’s ability to work both collaboratively and independently.
• Create a professional portfolio that includes digital images, video, audio, and written descriptions.
3 Credits  3 Weekly Lecture Hours

DPR 253  Integrated Software
The integrated software applications course is designed to be the capstone course in the professionalization of the Microsoft Office Specialist. The students will complete two integrated computer simulations. These simulations will include word processing, database, spreadsheet, and graphic presentation software. A graphics presentation is required in the course.
Upon successful completion of this course, the student should be able to:
• Complete job simulations with 70 percent or better accuracy.
• Compose letters, memos, and reports using spell checker and grammar checker.
• Apply the rules of grammar, punctuation and word division to documents.
• Use word processing, spreadsheet, database, graphic presentation skills and communications software to complete simulation projects.
• Use decision-support software such as electronic calendar, bulletin board, chat room and desktop publishing to complete office tasks.
3 Credits  3 Weekly Lecture Hours

DRA 100  Introduction to Theatre
This course surveys the world’s dramatic literature by concentrating on text analysis of a representative sample of plays of varying periods (ancient, classical, modern) and types (tragedy, comedy, drama). Emphasis is placed on the plays in performance. Field trips to theatrical productions may be scheduled. This is not an acting course.
Upon successful completion of this course, students should be able to:
• Identify through the development of theatre the social, cultural, economic, religious and political forces that have shaped the student’s world.
• Identify positive values through attending plays that will broaden and enrich the student’s life.
• Develop and expand the student’s sensory perception through the critical reading of play texts.
• Write and present oral critiques of plays seen and studied, using standards of drama criticism that enlarge the student’s appreciation of the art form.
• Apply theatre attendance in life as a continuing educational experience that enhances career aspirations and broadens cultural perspective.
Prereq. ENG 050 andREA 050
3 Credits  3 Weekly Lecture Hours

DRA 105  Acting Shakespeare
Special Studies
Acting Shakespeare is designed with the knowledge that the plays of Shakespeare were written to be spoken aloud, by actors on a stage. This course will investigate the plays of Shakespeare with that reality in mind, and introduce students to the myriad techniques Shakespeare used in his writing which assist the actor in the performance of his characters and the onstage telling of his stories. Acting and performance techniques from Shakespeare’s day to the present will be explored through vocal and movement exercises. Students are required to read several Shakespearean plays and to analyze the texts with the goal of performing monologues and scenes from those plays. Plays in performance will be emphasized and students will watch filmed stage productions. Students will be required to see a live theatrical production of a Shakespearean play when possible.

Upon successful completion of this course, students should be able to:
• Demonstrate, through text analysis and performance, an understanding of the fundamentals of Shakespeare’s verse and prose and how these relate to the acting of those texts.
• Demonstrate a working knowledge of acting techniques which have been applied to the works of Shakespeare throughout history.
• Bring to life one of Shakespeare’s characters from the plays, both physically and psychologically, and be able to communicate that character’s needs and intentions through performance.
• Effectively use vocal techniques to bring Shakespeare’s words, rhythms, and imagery to life.
• Work within a group and show an awareness of ensemble dynamics and cooperation.

3 Credits 3 Weekly Lecture Hours

DRA 110 Acting I
This acting course is designed to provide students with the basic rudiments of acting. Emphasis is on movement, breathing, voice (diction, projection, emphasis, interpretation), and script and character analysis. Students are required to read several plays and to attend at least two performances at area theaters. The hour TBA is provided for rehearsals. Theatre majors are encouraged to take DRA 100 in conjunction with this course as it provides insight into script analysis and staging practices.

Upon successful completion of this course, students should be able to:
• Describe the procedure for bringing a written script to performance.
• Demonstrate basic voice and movement techniques.
• Evaluate acting techniques.
• Recognize the various components of an artistic endeavor, including the roles of self-discipline, motivation, flexibility, cooperation and creativity.
• Perform short monologues and dialogues.

Prereq ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours

DRA 111 Acting II
Acting II is a continuation of Acting I. In this course, students refine skills they developed in Acting I and continue to explore the acting process through readings, theatre attendance and performance work. Emphasis is on character development through improvisation, script analysis, movement and scene projects. Students also examine the role of imagination, perception and creativity in acting.

Upon successful completion of this course, students should be able to:
• Identify period acting styles.
• Demonstrate physical and aesthetic awareness of acting techniques.
• Demonstrate an understanding of character interpretation through movement and voice control.
• Work effectively with others on acting projects.
• Demonstrate imaginative and creative talents through the actualization of theoretical concepts of acting.

Prereq DRA 110 or Instructor Permission

3 Credits 3 Weekly Lecture Hours

DRA 112 Voice Enhancement
This course develops proficiency in vocal skills through oral interpretation of literature, discussion of techniques and general conversations. Emphasis is on improvement of voice quality, articulation, language patterns, volume and rate control, pausing, phrasing and inflection. This is not a remedial speech course.

Upon successful completion of this course, students should be able to:
• Control rate, volume and tone of the speaking voice.
• Emphasize at will.
• Use flexible speech patterns.
• Control the speaking voice in a variety of situations.
• Interpret orally poems, works of fiction and nonfiction, and dramatic literature.
• Listen actively in order to evaluate his/her own performance as well as the performance of others.

Prereq ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours

DRA 115 Set Design and Construction
This is a workshop course; you will learn by doing. The classroom atmosphere will not be traditional, but rather will assume the appearance of a theater workshop where all of the sets and equipment for a stage production can be produced. There is no formalized homework, but students can expect to work a considerable number of hours outside the normal class meeting times. Students have the opportunity to learn how to paint scenic effects, produce stage lighting and sound, and construct flats and special props such as artificial stones, columns and any number of architectural details. Students must attend all rehearsals and performances where they will serve as a member of the stage crew or the lighting and sound crew.

Upon successful completion of this course, students should be able to:
• Design a simple stage set.
• Design basic stage lighting.
• Use basic carpenter’s tools safely and with precision.
• Build a simple “flat.”
• Paint simple scenic effects, such as rocks, wood, texture, etc.
• Orchestrate the movements of a stage crew to efficiently remove and erect stage sets before, during and after performances.
• Operate a basic lighting control board and sound equipment on cue.

Prereq ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours

DRA 120 Theatre Make-Up
Students learn the principles and acquire the skills of theatrical make-up design and application. The course provides students with the opportunity to apply both the principles and their acquired skills in make-up design to plays in production.

Upon successful completion of this course, students should be able to:
• Distinguish between types of plays and production styles.
• Apply skills of analysis to a play.
• Analyze personalities of characters in a play.
• Plot the role of each character in the over-all analysis of play in production.
• Recognize the relationships between character, costume, set design, lighting design and make-up.
• Apply principles of make-up to given characters.
• Design make-up for characters and plays.
• Distinguish between types of make-up and their uses.
• Create a make-up chart.
• Apply make-up.

3 Credits 3 Weekly Lecture Hours

DRA 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

3 Credits 3 Weekly Lecture Hours

DRA 200 Modern Drama
This course surveys the theatre of today with a close study of 10 to 12 contemporary plays. Plays are studied from the viewpoint of modern playwrights considering such themes as alienation, the impact of technology and futurism. There will be opportunities for theatre attendance.

Upon successful completion of this course, students should be able to:
• Identify the factors that make modern plays applicable to the student’s life.
• Recognize in a variety of modern plays contemporary issues in politics, religion, social questions in the play that touch on the student’s life.
• Describe the critical theory that every significant event in the world at any time has dramatic value (“A play exists in all human activity”-Brecht).
• Design a series of lessons and activities that effectively promote a positive attitude toward language arts, natural and physical science, social sciences and numbers operations in young children.

**ECE 110** Early Childhood Development

This course examines the physical, intellectual, emotional and social development of the child from prenatal life through early-childhood years. To assist students in gaining this knowledge in a well-organized manner, the course is structured into six areas of competence.

Upon successful completion of the course, students should be able to:

- Detail the significance of child development to the educator.
- Assess all major theories of development. Slight the determinants of development. Trace the development in the beginning of life. Identify the development through the first two years. Depict early-childhood development ages two to six.

**ECE 130** Observing and Recording the Behavior of the Young Child

This course is designed to increase objectivity and proficiency in reporting and assessing child behavior. The student observes and interprets the behavior of young children and writes analyses of these observations.

Upon successful completion of this course, students should be able to:

- Analyze the various ways children express themselves.
- Explicate the uses of observation and recording in early-childhood education.
- Evaluate the basic techniques used in observing young children.
- Employ effective observing and recording techniques in an early-childhood setting.

**ECE 140** Curriculum Development Program Planning and Instruction in Early Childhood Education

This course presents an integrated approach to current theories and practices in curriculum development, program planning and instruction in early-childhood education, and examines in depth the role of the teacher, curriculum, program and administration of the early-childhood center as it relates to the instruction of the young child.

Upon successful completion of this course, students should be able to:

- Evaluate the principal theories that influence current curriculum in early-childhood education.
- Analyze the theories and practices that influence current program planning in early-childhood education.
- Detail the basic problem in implementation of an early-childhood curriculum.
- Develop a comprehensive individual theory of curriculum, program planning and instruction in early-childhood education.

**ECE 199** Co-op/Internship

Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

**ECE 200** Educating the Culturally Different Young Child

This course examines the educational needs of young children who have cultural differences and explores teaching approaches to accommodate these needs in a cooperative environment, including parents, school and community interaction. To assist students in gaining this knowledge in a well-organized manner, this course is structured into areas of competence.

Upon successful completion of course requirements, students should be able to:

- Examine the nature of the culturally different child.
- Assess the significance of the environment to culturally different young children.
- Justify the importance of a positive learning environment and curriculum for culturally different young children.
- Detail good educational language experiences for culturally different young children.
- Explicate concept development of culturally different young children.
- Cite the teaching-learning strategies for these children.

**ECE 210** Educating the Exceptional Young Child

This course examines the psychological, physical and emotional facets of atypical young children, and methods for teaching and handling these children. To assist students in gaining this knowledge in a well-organized manner, this course is structured into areas of competence.

Upon successful completion of course requirements, students should be able to:

- State the basic information in this area of education.
- Depict the results of mental retardation.
- Assess speech and language disorder.
- Identify hearing and visual impairment and construct good learning environments for such children.
- Develop methods of educating handicapped children.
- Determine appropriate learning strategies for educating disabled young children.
- State various methods for educating emotionally disturbed children.
- Suggest activities and techniques for educating gifted young children.

**ECE 220** Health, Safety and Nutrition in Early Childhood Education

This course presents an integrated approach to current views on the health, safety and nutrition needs of children in early-childhood education.

Upon successful completion of course requirements, students should be able to:

- Interpret the state regulations as they pertain to the health, safety and nutrition needs of children in early-childhood education.
- Describe the basic characteristics of an efficient and effective health-care program for young children.
- Detail the basic components of a nutrition program for young children.
- Depict the basic component of a safety program for young children.

**ECE 290** Administration and Supervision of Early Care and Education Environments

This course will examine the varied aspects of administration and supervision in the early care and education environment. It is designed for early childhood educators who are or would like to take on an administrative role in an early childhood program. All administrative aspects of the early care and education program will be explored with particular emphasis on the development of interpersonal relationships and skills needed for effective program management.

Upon successful completion of this course, students should be able to:

- Identify the varied roles of the early care and education director.
**ECO 210  Macroeconomic Principles**
This course is designed to help beginning economics students comprehend the principles essential for understanding the basic economizing problem, specific economic issues, such as, Unemployment, Inflation and the process by which prices, in competitive markets, are determined. Students will also study some key aspects of International Economics, its importance and impact on the domestic economy. This course will also assist students to understand and reason accurately and objectively about economic matters.

Successful completion of this course should enable students to verbally, graphically and mathematically:
- Show how economic resources and goals relate to a price system based on supply and demand.
- Explain how the economy can be ascertained through national income accounts (GNP, NI, PI, DI).
- Identify and evaluate the economic consequences of different trade policies.
- Explain how fixed and flexible exchange rates influence Balance of Payments accounts: the Current Account, the Capital Account and the Official Reserve Account.
- Assess the significance of international trade and finance for the U.S. and world economies.
- Evaluate economic instability and fiscal policy through classical Keynesian and monetarist models.
- Explain how financial markets, the Federal Reserve System and the banking system interrelate in monetary policy.

Prerequisites: AAS or AS in ECE or related field OR completed 45 hours towards an AAS degree.

3 Credits  3 Weekly Lecture Hours

**ECO 220  Microeconomic Principles**
Microeconomics is a course designed to help beginning economics students comprehend the principles essential for understanding the basic economizing problem, behavior of individual households and firms in market economy, and how the complex forces of Demand and Supply determine the prices of goods and services in these markets. Students will also learn how to analyze several market structures: Perfect Competition, Monopoly, Oligopoly, Monopolistic Competition. They will study some key aspects of International Economics, its importance and impact on the domestic economy.

Successful completion of this course should enable the student to verbally, graphically and mathematically:
- Explain how economic resources and goals relate to a price system based on supply and demand.
- Explain market failure through the interaction of public and private sectors of the economy where externalities, public goods, poverty and growth are involved.
- Show how the factor markets are affected by supply, demand, economic rent, interest and profit.

Prerequisites: AAS or AS in ECE or related field OR completed 45 hours towards an AAS degree.

3 Credits  3 Weekly Lecture Hours

**EDU 200  Foundations of American Education**
This course provides students with an understanding of modern education in our society and examines the impact of current issues on American education today. To assist students in gaining knowledge in a well-organized manner, the course is structured into seven areas of competence.

Upon successful completion of course requirements, students should be able to:
- Summarize the historical foundations of education.
- Cite the philosophical bases of education.
- Depict the control, organization and support of American education.
- Analyze the school’s role in our society.
- Delineate the structure of all varieties of education programs.
- Summarize the professional aspects of teaching.
- Suggest the prospects of American education in the future.

3 Credits  3 Weekly Lecture Hours

**EDU 205  Strategies for Effective Classroom Management**
This course will review the major theories of effective classroom management and the various models of effective classroom discipline. The course maintains that effective discipline must be taught, and it occurs in a collaborative school culture.

Upon successful completion of the course, students should be able to:
- Evaluate, analyze, and synthesize ideas from a variety of research sources and formulate a preventative model of classroom management.
- Analyze a classroom environment for effective classroom management strategies.
- Apply critical thinking and information literacy strategies to understand the concepts of an effective classroom environment.
- Demonstrate an understanding of effective teaching.

3 Credits  3 Weekly Lecture Hours

**EDU 206  Technology in Education**
This course is a one-semester introduction to the use of computers in the elementary and secondary school classroom with an emphasis on successfully integrating technology-based materials to enhance student learning. The course will combine educational theory with computer-based activities to complement major course concepts. In addition, a course website will be used to encourage communication and information sharing among course participants.

Upon successful completion of the course, students should be able to:
- Increase knowledge of computers, networking, the Internet and World Wide Web as they relate to K-12 education.
- Identify appropriate methods of evaluating websites and software applications. Describe current instructional principles, research and appropriate assessment practices as related to the use of computers and technology resources in the curriculum.
- Discuss and critique issues related to use of computers in education, including security, equity, copyright and ethics of using the Internet in the classroom. Construct appropriate applications of technology to specific instructional situations.
- Design or develop appropriate instructional technology-based applications.
• Name appropriate professional development resources for maintaining currency in the field.
• Use techniques involved in developing technology-based instructional materials in various formats.

EDU 220 Inclusive Classrooms Special Studies
This course will review the major needs of students with disabilities and how to plan instruction for them. It will also review special education procedures and services and how to assess and adapt instruction to meet the needs of specialized populations in K-12 schools.

Upon successful completion of this course, students should be able to:
• Understand special education procedures and services.
• Develop the ability to evaluate and assess students’ needs.
• Analyze a classroom environment for effective teaching practices.
• Understand the differences between high incidence and low incidence disabilities. Define strategies for independent learning and grouping practices.
• Demonstrate an understanding of how to adapt instructional materials and grading practices for student with disabilities.
• Identify significant events that have shaped the history of special education law and teaching methods.
• Identify appropriate resources and support services available to students with disabilities.

Prereq. PSY 140, ENG 112
3 Credits 3 Weekly Lecture Hours

EDU 215 Theory and Field Experience In Elementary Education
This course will provide an orientation to various aspects of teaching in K-6 schools. Topics will include curriculum, planning, effective instruction, discipline, and the structure of the school. Field experiences will be related to course topics. Students will complete 36 hours of observation in the field. Field Experience will give students the opportunity to visit schools and classrooms prior to student teaching to observe and reflect on the principles and practices learned in the college classroom. Furthermore, students will come in contact with children having varying needs and educational issues.

Upon successful completion of the course, students should be able to:
• Describe the roles of the State Department of Education.
• Describe the technical areas in which practicing engineers work.
• Identify significant events that have shaped the history of special education law and teaching methods.
• Explain the role of curriculum, and various ways of effectively teaching it to students.
• Demonstrate understanding of the role of the classroom teacher on a daily basis and as a professional.
• Demonstrate an understanding of the factors that support a safe and positive classroom climate, and how to create it.
• Describe the role and functions of the State Department of Education.

Prereq. DPR 100
3 Credits 3 Weekly Lecture Hours

EDU 100 Engineering Graphics
The fundamentals of drafting, space geometry of points, lines and surfaces, graphs, graphical mathematics and design projects.

Upon successful completion of this course, students should be able to:
• Reduce concepts and configurations to freehand sketches.
• Construct orthographic drawings using drafting standards, conventions and instruments.
• Construct pictorial and axonometric instrument drawings.
• Solve descriptive geometry problems.
• Apply the principles of graphic mathematics to scales, graphs, nomograms, empirical equations and Graphical calculus.
• Create and plot computer-aided drawings.
• Solve individual and group preliminary design projects.

Prereq. ENG 112, PSY 140, EGR 200
3 Credits 3 Weekly Lecture Hours

EDU 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

EDU 200 Engineering Mechanics I
A vector mechanics study of forces acting on static particles and rigid bodies. Equilibrium of rigid bodies, distributed body forces acting on centroid, centers of gravity and moments of inertia, analysis of structures, forces in beams and cables, friction and virtual work are topics covered.

Upon successful completion of this course, students should be able to:
• Resolve forces acting in plane and space configurations.
• Develop equivalent-force systems by means of vector, dot, cross and triple products.
• Solve equilibrium problems on two- and three-dimensional bodies.
• Determine the effect of distributed forces on bodies in terms of center of gravity and moment of inertia.
• Analyze the internal forces on structures such as trusses, frames, machines, beams and cables.
• Investigate the friction between moving components on mechanisms such as wedges, screws, bearings, wheels and belts.
• Use the method of virtual work to solve for forces, mechanical efficiency, potential energy, equilibrium and stability.

Prereq. ENG 112, PSY 140, EDU 200
3 Credits 3 Weekly Lecture Hours

EDU 101 Engineering Mechanics II
A course in vector dynamics. Topics include the kinematics and kinetics of particles and rigid bodies in plane and three-dimensional motion. Force, energy and momentum methods, as well as the study of unidirectional vibrations are covered.

Upon successful completion of the course, students should be able to:
• Analyze the kinematics of particles and rigid bodies for unidirectional, bidirectional and general motion.
• Develop the kinetics of particles and rigid bodies in terms of force, energy and momentum for unidirectional, bidirectional and general motion.
• Determine the motion of single particles and rigid bodies in one-dimensional vibrating or oscillating systems.

Prereq. or Coreq. EGR 200 and MAT 261
3 Credits 3 Weekly Lecture Hours

EDG 200 Engineering Circuits
A first course in circuits for engineers. Uses the basic concepts of modern circuit analysis. Topics include two-terminal devices and their classification, circuit topology and Kirchoff’s Laws, lumped-circuit analysis using matrix algebra, controlled and independent sources, power and energy, and second-order time-domain techniques (including singularity functions, convolution and introductory state-variable techniques). Theory will be illustrated by laboratory and class assignments. Upon successful completion of this course, students should be able to:
• Set up and solve circuit problems using mesh analysis.
• Set up and solve circuit problems using nodal analysis.
• Set up and solve for the transient response of first-order and second-order circuits.
• Set up and solve for the general solution of first-order and second-order circuits.
• Find the initial conditions of first-order and second-order circuits.
Use instruments (DMM, power supplies, function generators, oscilloscopes) to measure various electrical quantities.

Find the impulse response of electrical circuits.

Find the response to a given input of an electrical circuit using convolution.

Prereq. PHY 132, Coreq. MAT 261

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

**ELT 220 Thermodynamics**

Engineering Thermodynamics is an introductory one-semester course with lecture, demonstrations, and computer simulations, designed for engineering and science students. Major topics include: concepts of thermodynamics; pressure; temperature; heat and heat transfer; properties of substances; density; extensive and intensive properties; First Law of Thermodynamics and its application; Second Law of Thermodynamics and its application; reversible and irreversible processes; the Clausius, Kelvin, and Planck statements of the Second Law; entropy and Carnot, Otto, Diesel, and Rankine cycles; power cycles and the refrigeration cycle. Upon completion of this course, the student should be able to:

- Understand the basic concepts and definitions needed to apply the laws of thermodynamics.
- Describe the properties and behavior of a pure substance.
- Develop the First Law of Thermodynamics and apply it to control volume problems.
- State the Second Law of Thermodynamics and describe its significance to the analysis of cycles and processes.
- Understand the concept of entropy and its relationship to the Second Law of Thermodynamics.
- Analyze the operation of power and refrigeration systems.

Prereq. PHY 132, MAT 161, CHE 110, DPR 100

3 Credits 3 Weekly Lecture Hours

**ELT 100 Residential Wire I**

Residential Wiring I provides students with the basic skills necessary in the field of electrical construction. The course of study emphasizes the proper application of materials, safety and the National Electrical Code. The student will review math skills to prepare for calculations necessary in the electrical field.

Upon successful completion of this course, students should be able to:

- Explain how information is conveyed to the electrician in the field via plans and specifications.
- Compute proper box sizing per the National Electrical Code.
- Calculate proper electrical service requirements for an intended use.
- Perform basic calculations necessary for a safe and efficient installation.
- Describe basic electrical circuits.
- Specify material appropriate for residential use per the National Electrical Code.
- State the function of basic electrical safety devices such as ground-fault circuit interrupters and circuit breaker.
- Size conductors and over current devices.

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

**ELT 101 Residential Wire II**

This course presents new concepts and rules according to the National Electrical Code and further demonstrates the proper application of materials, methods and requirements for a proper residential wiring installation that is safe and free from defect. Stressed in the course will be circuit planning and design for the residential setting.

Upon successful completion of this course, students should be able to:

- Apply National Electrical Code requirements to the installation of all electrical devices and appliances in a residential setting as well as grounding and bonding.
- Use Ohm’s law in the design and troubleshooting aspects of the electrical system.
- State the function of oil and gas heating system controls.
- Install a low-voltage residential wiring system.

Prereq. ELT 100

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

**ELT 102 Commercial Wire I**

Commercial Wiring I presents the requirements of a commercial electrical installation. Specific commercial installation methods, techniques, materials and National Electrical Code requirements will be presented.

Upon successful completion of this course, students should be able to:

- Define job requirements from the contract documents. Identify and properly apply different wiring devices.
- Size and apply various types of conduits.
- Install electrical boxes.
- Size and install branch circuits per National Electrical code requirements.
- Demonstrate a working knowledge of special raceways, outlets and communication systems.
- Read engineering drawings.
- Properly apply National Electrical Code requirements to the intended use presented by engineering drawings.
- Describe the different types of lighting systems and associated fixtures.

Prereq. ELT 101

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

**ELT 103 Electrical Code**

This course will acquaint the students with the many aspects of the National Electrical Code. The National Electrical Code is the basic code that governs all electrical installations. The course will offer the student the opportunity of learning proper application of the code to all facets of the electrical installation.

Upon successful completion of this course, students should be able to:

- Apply the National Electrical Code index in referencing a question.
- Cite a proper interpretation as to the intent of the National Electrical Code.
- Identify tables applicable to various situations.
- Cite the evolution of the National Electrical Code.
- Identify and apply proper over current protection devices for a circuit in accord with the Code.
- Apply minimum Code requirements to a floor plan of a residence, relating outlet locations, and minimum service entrance size and number of circuits required.

2 Credits 2 Weekly Lecture Hours

**ELT 200 Commercial Wire II**

This course continues to apply the knowledge of Commercial Wiring I and requires application of the skills learned in previous courses. Stressed will be the application of high voltage components to the system and calculations necessary to have a safe and efficient commercial wiring installation.

Upon successful completion of this course, students should be able to:

- Develop a basic loading schedule for the commercial wiring installation.
- Select and properly install the proper panel board.

Upon successful completion of this course, students should be able to:

- Demonstrate knowledge of the commercial wiring system including various types of transformers, disconnecting devices, service entrances and metering configurations.
- Cite the requirements for an emergency power system.
- Perform necessary short-circuit calculations.
- Coordinate over current devices.
- Demonstrate a basic understanding of a cooling system.
- Apply grounding system.

Prereq. ELT 102

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

**ELT 201 Industrial Electric I**

This course will introduce the basic fundamentals of the installation and control of electricity in the industrial setting, allowing the student to gain knowledge of proper wiring methods, conductor sizing, DC generators and DC motor controls. Also covered will be circuit calculations for parallel, series and combination circuits.

Upon successful completion of this course, students should be able to:

- Identify and draw from memory a sample of the common electrical symbols in use.
- State and apply Ohm’s law.
- Describe and construct a parallel circuit.
- Lay out circuits in series.
- Define and describe combination circuits.
- Calculate the cost of operating electrical equipment.
- Use electrical measuring instruments.
- Describe and properly apply various splices used in the field.
- Describe the basic operation of an AC or DC generator.
- Apply and connect various manual and automatic motor starters.

Prereq. ELT 200

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

**ELT 202 Industrial Electric II**

This course will include heavy coverage in the areas of transformer selection and installation, AC circuits, AC motor control, industrial lighting and electric heat.

Upon successful completion of this course, students should be able to:

- Describe the effect of high- and low-power factors on alternating current circuits.
- Cite the methods for producing single and multi phase voltages.
- State the construction and operating characteristics of transformers, illustrating the various types of transformer connections and discussing the results of these connections.
- Detail the construction of various AC motors.
- Demonstrate a knowledge of the construction and operation of various types of motor controllers and protective devices.
- Determine the amount of light required for various areas and types of work.
- Lay out and select the correct lighting fixtures for various areas.
- Explain the operation of electronic motor controls.

Prereq. ELT 201

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

**ELT 203 Industrial Electrical Systems**

This course provides the student with an introduction to various electrical systems and devices used in a manufacturing/commercial facilities environment. Students will learn how to identify the function of electrical components, to include relays, sensors, switching/other devices and circuits. Instruction will include the theory and use of electrical instruments, to install and make repairs as well as identify, troubleshoot isolate and remedy problems. Emphasis will

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be placed on electric motors and motor controls. Topics of instruction will cover installation of electrical conduit, wiring, motors and other devices. Upon successful completion of this course, the student should be able to:

- Define the terminology associated with common basic electrical systems and devices.
- Describe the operational characteristics and applications of various sensing devices.
- Identify and describe the function of basic control circuits/components.
- Contrast electrical starting and braking methods.
- Compare wound rotor, synchronous and consequent pole motors.
- Conduct job planning routines for various electrical component and system installations/repairs/replacements.
- Determine sizes and install electrical conduit, boxes, wiring, etc. with regard for engineered work plans and appropriate standards.
- Install motor controls and motors.
- Discuss and troubleshoot sensing devices and circuits, to include ground faults.
- Determine a methodology for troubleshooting various distribution and control circuits. Troubleshoot variable frequency AC motor drives.

**Prep**: TCC 111, TEL 101, IST 105
3 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

**ELT 204 Introduction to Programmable Logic Controllers**

This introductory course is intended to acquaint students in a hands-on mode with the basic skills and knowledge of programmable logic controllers, with respect to Industrial Systems. Students will learn to interpret electrical and Programmable Logic Controller (PLC) input/output diagrams and ladder logic. In addition, they will become acquainted with PLC functions, components, circuitry, testing of PLC programs and troubleshooting a PLC system. This course is recommended for students with little or no programmable logic controller experience. Upon successful completion of this course, students should be able to:

- Discuss terminology associated with PLCs.
- Describe the function, uses and operation of a PLC.
- Define the function and operation of input/output diagrams and system networks.
- Interpret ladder logic to determine the functions of a mechanical equipment.
- Discuss event driven sequencing as it relates to the input and output terminals of the PLC.
- Compare the operation of a PLC to manual and automatic control devices.
- Decoder which inputs and outputs are controlling internal counters and math functions.
- Interface wiring ladder logic diagrams with controller equipment.
- List the functions and types of timer instructions and give applications.
- Diagnose a PLC program, as it relates to mechanical environment.
- Use PLC diagnostic equipment.
- Diagnose a motor control program in both manual and automatic modes.
- Analyze the consequences on the system being controlled of changing a PLC program.
- Identify the function and operation of a program interlock and give an application.
- Troubleshoot various levels of PLC systems to include up and down counter, timer and branching instructions.

**Prep**: IST 105, TME 115 Coreq. ELT 203
2 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

**EMS 100 Emergency Medical Technician**

This intensive program is designed to instruct the pre-hospital care provider in the skills necessary to reduce mortality and morbidity from accident and illness. Topics covered include patient assessment, cardiopulmonary resuscitation, mechanical aids to ventilation, trauma management, head, neck and spinal injuries, fractures, medical and environmental emergencies, crisis intervention and vehicle rescue.

Upon successful completion of this course, students should be able to:

- Assess and control hazards present to self, victim and bystanders at the scene of a pre-hospital medical emergency situation.
- Assess extent of injury to victims suffering pre-hospital accident or illness.
- Demonstrate ability to recognize and provide appropriate emergency care to victims suffering cardiac arrest and/or airway obstruction.
- Demonstrate ability to assess and provide adequate emergency care for victims suffering trauma to one or more body systems.
- Communicate patient care information in an effective professional manner both verbally and in writing.
- Demonstrate ability to assess cardiac, respiratory, diabetic and associated medical and environmental emergencies.
- Evaluate obstetrical emergencies and provide appropriate assistance and/or emergency intervention to the expectant female.

**7 Credits 5 Weekly Lecture Hours 4 Weekly Laboratory Hours**

**EMS 105 Critical Incident Stress Management**

This course is designed to provide the student an opportunity to examine his/her own stress management needs and skills. Topics presented include but are not limited to, the importance of self-evaluation, journalizing and diaries. Research projects will require each student to explore a stress management topic and offer a presentation of the findings and solutions. In addition, the course will provide the elements necessary to complete the International Critical Incident Stress Foundation’s (ICISF) requirements for the Critical Incident Stress Management: Basic Course. Upon successful completion of this course, students should be able to:

- Define stress and stress management.
- List various theories of stress related diseases.
- Identify the behavioral, cognitive, emotional, physical, and spiritual symptoms of stress.
- Define the common intrinsic, traumatic and cumulative types of stresses associated with emergency service work.
- List the concepts of acute stress disorder and post-traumatic stress disorder.
- List the major influences in the development of Critical Incident Stress Management (CISM).
- Define the methods and protocols of approach and intervention.
- Discuss the use and role of demobilization in critical practice.
- Identify the four phases of crisis management briefing.
- List the concepts of disaster psychology.
- Identify the methods for stress reduction to be utilized by families in CISM practice.
- Identify the recovery process from organizational stress.
- Define the newest thoughts, ideas, and trends in CISM.
- Explain the use of CISM in the community, schools, business and industry, and other venues.

**1 Credit**

**EMS 110 Patient Assessment Special Studies**

This course is designed to provide the student with theory, concepts and the applications necessary to measure the pre-hospital scene and its surroundings, which will provide valuable information to the paramedic. Additionally, the student will be able to prioritize care based on patient assessment, which includes body substance isolation, scene safety, recognition and stabilization of life-threatening conditions, identification of patients who require rapid stabilization and transportation for definitive care.

Upon successful completion of this course, students should be able to:

- Identify the components of patient assessment and examination.
- List the components of stress.
- Outline effective patient communication techniques.
- Apply interventions as identified during patient assessment.
- Identify priorities of management of the medical and traumatic patient.
EMS 120 Airway Management and Ventilation

This course is designed to provide the student with theory and concepts of the anatomy and physiology of the respiratory system. The course will examine the mechanics of respiration, gas exchange, regulation of respiration, foreign body airway obstructions, and airway evaluation. In addition, the student will study the essential parameters of airway evaluation, airway management, and airway procedures.

Upon successful completion of this course, students should be able to:

- Discuss the assessment and management of the respiratory system.
- Identify the anatomy and physiology of the respiratory system.
- Describe variations in assessment and management of the respiratory system.
- Outline the mechanics of the respiratory system.
- Describe the regulation of the respiratory system.
- Describe devices and techniques in the management of the respiratory patient.
- Describe conditions and complications associated with the respiratory system.
- Utilize pharmacological agents in management of the respiratory system.
- Utilize manual and mechanical interventions in management of the respiratory system.
- Distinguish between respiration, pulmonary ventilation, and external and internal respiration.
- Describe pulmonary circulation.
- Describe voluntary, chemical, and nervous regulation of respiration.
- Outline essential parameters to evaluate the effectiveness of airway and breathing.
- Describe the indications, contraindications, and techniques for supplemental oxygen delivery.
- Discuss methods for patient ventilation.
- Describe the assessment techniques and devices used to ensure adequate oxygenation.

3 Credits 2 Weekly Lecture Hours 1 Weekly Laboratory Hour

EMS 130 Leadership and Influence in Emergency Response

This course will provide the student with an overview of the theories and concepts of leadership development. The course will examine leadership from a value (core values) approach, systems (chain of command) approach, a functional approach, and a skills approach (motivation, supervision, and communications). In addition, the student will study the process approach by looking at leadership as a process of influencing an organization/group to achieve goals.

Upon successful completion of this course, students should be able to:

- Define the terms “leadership” and “influence” relative to emergency response.
- Identify the roles and responsibilities associated with leadership.
- Differentiate between leadership and ego.
- Identify the need for, and the role of, leadership in the incident management system.
- Define the terms “teamwork” and “cooperation” relative to leadership and influence in emergency response.
- Identify the consequences of poor or ineffective leadership in an emergency.
- Recognize what it takes to be influential and the need for influence in certain circumstances.
- Describe how leadership can influence people, their response to activities, their safety and their future leadership styles.

Prereq. EMS 204

3 Credits 2 Weekly Lecture Hours 1 Weekly Laboratory Hour

EMS 132 Search and Rescue

This course will provide the student with the knowledge concerning the general responsibilities, skills, abilities, and the equipment needed by those involved in search and rescue efforts. The course also provides the student with practical exercises and search missions where they are required to utilize the proper equipment. The contents of the course include topics in three major areas: survival, support, and search and rescue. Additionally, the student is provided with an excellent opportunity to discuss and investigate the role of search and rescue in relation to incident management as well as the roles and responsibilities of search and rescue leaders. Students will learn from the experiences of others to sharpen their understanding and skills relative to search and rescue.

Upon successful completion of this course, students should be able to:

- Define the components of search and rescue operations and resources.
- List the major responsibilities for search and rescue.
- Describe the components of Incident Command System (ICS) and their functions.
- Differentiate between at least three types of maps used in search and rescue.
- Identify the use of topographical maps.
- Define the plotting methods or grid systems.
- Describe the parts of the compass.
- Utilize a compass.
- Define the six crucial steps in search and rescue management.
- Differentiate between the two basic categories of search tactics (Passive and Active).
- Describe the primary types of active search tactics.
- Describe the techniques and methods used by searchers.
- List the different skills needed by field searchers.
- Explain why knowledge of lost person behavior can be an advantage to the searcher.

Prereq. EMS 204

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

EMS 133 Emergency Planning

This course will provide the student with a forum for discussion of the basic need for emergency management, emergency planning and incident management. The course will also overview the roles and responsibilities of the Incident Safety Officer in preparation for a series of response drills to implement student knowledge in these areas. In addition, a functional exercise will be conducted to test the course outcomes and competencies.

Upon successful completion of this course, students should be able to:

- Understand the application of the various roles and responsibilities in incident management.
- Identify the roles and responsibilities associated with incident management.
- Identify the difference between Incident Command and Unified Command.
- Define the roles of various functionaries in the incident management system.
- Define the terms “teamwork” and “cooperation” in incident management.
- Evaluate hazards and risks associated with emergency response operations.
- Correct hazardous conditions associated with emergency response operations.
EMS 201 Pre-hospital Trauma Life Support (PHTLS)

The focus of this course is upon the need for the pre-hospital emergency-care provider to recognize life-threatening traumatic injuries and implement appropriate intervention. Emphasis is placed upon rapid assessment, treatment for shock and hypoxemia, and rapid transport to definitive surgical intervention.

Upon successful completion of this course, students should be able to:

- Relate basic principles of physics to the manner in which they generate traumatic injury in accident victims.
- Perform rapid patient assessment to discover immediate life threatening traumatic injuries.
- Develop and initiate an efficient emergency-care plan with emphasis on spinal stabilization and airway management and ventilation.
- Demonstrate knowledge of thoracic anatomy and physiology, the consequences of injury to the thoracic cage, and appropriate emergency medical intervention for thoracic trauma.
- Demonstrate knowledge of abdominal cavity anatomy and physiology, the consequences of injury to the abdominal area and appropriate emergency medical intervention for abdominal injuries.
- Apply appropriate principles of spinal-injury management to simulated traumatic injury situations.
- Identify categories of head trauma, consequences thereof, and appropriate emergency medical interventions.
- Discuss the implications of burn injury as a complicating, concurrent injury to the trauma patient.
- Demonstrate application of appropriate pre-hospital trauma-management principles in a series of trauma-injury simulations.

Preq. EMS 200

1 Credit 16 Weekly Laboratory Hours

EMS 202 Emergency Medical Management of Patients Contaminated by Hazardous Materials

This course will provide the students with the information necessary to assess and properly manage the threats to self, co-workers and patients posed by victims contaminated by hazardous materials. Recognition and identification of the hazardous materials posing the threat will be stressed. In addition, steps necessary to comply with consensus and regulatory standards such as OSHA 1910.120 and JCAHO are presented.

Upon successful completion of this course, students should be able to:

- Describe the means by which the hazardous materials contaminating the victim may be identified.
- Employ reference manuals and sources to determine an appropriate pre-hospital medical protocol for initiating patient care.
- Demonstrate contamination reduction practices necessary to protect emergency response staff.
- Demonstrate appropriate procedures for decontaminating the victim prior to initiating patient care.
- Demonstrate ability to select and utilize appropriate hazardous materials personal protective equipment.
- Describe record keeping procedures necessary to establish an OSHA-required hazmat, hazardous materials exposure file for each responder exposed to the hazardous material.

Preq. EMS 100

1 Credit 3 Weekly Lecture Hours

EMS 203 Introduction to Advanced Life Support I

This course is designed to provide the student with the necessary knowledge of the roles and responsibilities of advanced life support systems and procedures. Topics such as medical/legal ethics, drug information, the cardiovascular system, and proper medication administration will be presented. Experiments and case studies will be presented during this course.

Upon successful completion of this course, students should be able to:

- Define the roles and responsibilities of the paramedic in the Emergency Medical Service (EMS) system as they relate to history, system development, education, research, and continuous quality improvement.
- Explain the individual’s role in providing emergency patient care.
- Outline the individual’s role in promoting community health education, wellness, and prevention.
- Identify professional, ethical, legal and moral accountability issues and situations.
- Identify the proper use and administration of drugs for various body systems.

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

EMS 204 Incident Management

This course is designed to provide the student with an overview of the Incident Command-Unified Command Structure. Additionally, a look at incident management from various perspectives such as local fire departments, industrial settings, the Oklahoma City bombing, and others will be discussed. The student will work in an interactive program to prepare for future roles and responsibilities as those charged with a management role in incident command, control or mitigation. Moreover, the student will learn from the experiences of others, sharpening their understanding and skills relative to the dimensions of emergency incident management.

Upon successful completion of this course, the student should be able to:

- Define the terms and regulatory framework of incident management.
- Identify the roles and responsibilities associated with incident management.
- Differentiate between Incident Command and Unified Command.
- Recognize the need for, and the role of, various functionaries in the incident management system.
- Define the terms teamwork and cooperation in incident management.
- Identify the consequences of a poor or ineffective incident management structure.
- Recognize the need for and use of, incident management.
- Describe how incident management is applied in various emergencies.

3 Credits 3 Weekly Lecture Hours

EMS 205 Introduction to Advanced Life Support II Special Studies

This course is a continuation of Introduction to Advanced Life Support I and is designed to stress practices applicable to the paramedic practitioner. Emphasis will be placed on medication application, pharmacologic and therapeutic concepts and practices. Various approaches are covered to ensure that the student receives broad exposure to all areas required for the paramedic practitioner. Experiments and case studies will be presented during this course.

Upon successful completion of this course, students should be able to:

- Identify and correct unsafe acts that are observed during functional exercises as they apply to recognized standards provided by fire, police, medical and hazardous material regulations.
- Develop a plan of action to reduce or alleviate hazards.
- Implement a plan of action to reduce or alleviate hazards.

Preq. EMS 204

1 Credit 1 Weekly Lecture Hour

EMS 140 Trauma Systems and Mechanism of Injury Special Studies

This course is designed to provide the student with the knowledge and skills to recognize the mechanisms of injury, trauma systems, patient assessment and emergency care. The course will also cover, in detail, the importance of the length of time that elapses between the incident and definitive care. Additionally, the course addresses the major roles in death reduction in three periods of trauma: through community education, scene interventions, and rapid response. Trauma systems, appreciation of comprehensive trauma systems, blunt trauma, and penetrating trauma will be thoroughly discussed.

Upon successful completion of this course, students should be able to:

- Describe the incidence and scope of traumatic injuries and deaths.
- Identify the role of each component of the trauma system.
- Predict injury patterns based upon knowledge of the laws of physics related to forces involved in trauma.
- Describe injury patterns that should be suspected when injury occurs from blunt trauma.
- Describe the role of restraints in injury prevention and in injury patterns.
- Discuss how an organ’s motion may contribute to injury in each body region depending on the forces applied.
- Identify selected injury patterns associated with motorcycle and all-terrain vehicle (ATV) collisions.
- Describe injury patterns associated with pedestrian collisions.
- Identify injury patterns associated with sports injuries, blast injuries, and vertical falls.
- Describe factors that influence tissue damage related to penetrating injuries.

Preq. EMS 200

5 Credits 3 Weekly Lecture Hours 4 Weekly Laboratory Hours

EMS 200 Pre-hospital Emergency Care

The scope of this clinical experience will provide students with the opportunity to apply knowledge obtained in EMT to the pre-hospital clinical environment.

Upon successful completion of this course, students shall have been assessed by a clinical preceptor to possess the clinical competence to:

- Perform patient assessment/evaluation to assess the severity of medical or traumatic conditions which the victim may be experiencing.
- Perform basic life support cardiopulmonary resuscitation employing oxygen delivery and airway control devices.
- Administer oxygen to victims of accident or illness using masks and positive-pressure ventilation devices.
- Suction blood, vomitus and other secretions from the airway by means of oropharyngeal suctioning.
- Administer appropriate pre-hospital medical protocol for initiating patient care.
- Demonstrate contamination reduction practices necessary to protect emergency response staff.
- Demonstrate appropriate procedures for decontaminating the victim prior to initiating patient care.
- Demonstrate ability to select and utilize appropriate hazardous materials personal protective equipment.
- Describe record keeping procedures necessary to establish an OSHA-required hazmat, hazardous materials exposure file for each responder exposed to the hazardous material.

Preq. EMS 100

3 Credits 6 Weekly Laboratory Hours
EMS 210 Medical Emergencies I
This course is designed to prepare the paramedic student to manage numerous types of medical emergencies. Topics including the etiology and epidemiology of cardiopulmonary diseases and conditions will be discussed as well as the means to identify and describe the function of the cardiopulmonary system. Upon successful completion of this course, students should be able to:
- Identify the risk factors and prevention education of cardiovascular disease processes.
- Distinguish pathophysiology of respiratory emergencies related to ventilation, diffusion, and perfusion.
- Assess causes, complications, and conditions of the cardiopulmonary system.
- Describe the anatomy and physiology of the cardiopulmonary system.
- Identify the electrophysiology of the cardiac system.
- Describe cardiovascular disease processes.
- Distinguish among varied techniques in managing cardiac and pulmonary emergencies.
- Apply emergency intervention on patients suffering from cardiopulmonary conditions.
- Describe anatomy and physiology of the nervous system.
- Identify disorders of the nervous, endocrine, and gastrointestinal systems.
- Identify neurological disorders.
- Describe causative agents and the pathophysiology of ingested poisons.
- Assess acute abdominal pain. Specify disorders of the endocrine system.
- Describe the anatomy and physiology of the endocrine glands that assist the body in the maintenance of homeostasis.
- Describe the antigen antibody response.
- Describe signs and symptoms of all allergic reactions.
- Describe signs and symptoms, complications, and pre-hospital management of gastrointestinal disorders.

4 Credits
3 Weekly Lecture Hours
2 Weekly Laboratory Hours

EMS 220 Concepts and Practices I
This course is designed for the student who is prepared to participate in clinical experiences which should occur after the student has demonstrated competence in skills and knowledge in the didactic and laboratory components of the program. The student will have the opportunity to achieve proficiency by performing skills on actual patients in a clinical setting. Alternative learning experiences (simulations, programmed patient scenarios, etc.) will be developed. Proficiency in performing all steps and procedures safely and properly will be thoroughly discussed.

Upon successful completion of this course, students should be able to:
- Demonstrate safe practices in the pre-hospital environment.
- Demonstrate the ability to serve as a team leader in a variety of pre-hospital emergency responses.
- Recognize the need for advanced life support interventions.
- Demonstrate the proper application and performance of basic life support skills.
- Demonstrate proper performance of advanced life support procedures and skills.
- Apply the appropriate advanced life support skills in an emergency situation.

6 Credits
4 Weekly Lecture Hours
4 Weekly Laboratory Hours

EMS 221 Medical Emergencies II
This course is a continuation of Medical Emergencies I, and it is designed to provide the student with additional information necessary to effectively perform in medical emergency situations. Emergencies pertaining to neurology, endocrinology, allergies and anaphylaxis, gastroenterology, uriology, and toxicology will be discussed. In addition, topics include, but are not limited to, hematology, environmental conditions, and behavioral disorders.

Upon successful completion of this course, students should be able to:
- Distinguish between poisoning by ingestion, inhalation, and injection.
- Recognize conditions relating to drug and alcohol abuse.
- Identify key components and normal functions of the urinary system.
- Describe detailed pathophysiology and assessment of urinary system disorders.
- Identify abdominal and genitourinary disorders, acute abdominal pain, and systemic illnesses.

Upon successful completion of this course, students should be able to:
- Apply management and treatment priorities for toxic syndromes.
- Discuss the pathophysiology of blood and hematology.
- Apply the theory of thermoregulation to various patient presentations.
- Distinguish among the recognition, transmission, and pathophysiology of infectious diseases.
- Discuss the critical behaviors of professional emergency responses.
- Identify potential causes of behavioral and psychiatric illnesses.
- Distinguish varied methods of approaching violent and non-violent patients (adult or child).
- Describe the physiologic process of menstruation and ovulation.
- Describe the structure and function of processes during pregnancy.
- Describe detailed assessment and management of obstetrical and gynecological emergencies.

4 Credits
3 Weekly Lecture Hours
2 Weekly Laboratory Hours

ENG 025 Basic & Essential Writing
This course is designed for students who have knowledge of sentence structure. The purpose of this course is to develop writing skills. Students will start with a focus on writing clear, Standard English sentences with appropriate use of grammar, punctuation, and spelling and will progress to writing short paragraphs. Upon successful completion of this course, students should be able to:
- Comprehend verbal and written directions.
- Identify the parts of speech.
- Analyze the structure of sentences.
- Construct simple and compound sentences with appropriate usage, punctuation and spelling.
- Demonstrate improvement in written vocabulary.
- Brainstorm effectively.
- Recognize and correct common errors in usage, punctuation, and sentence structure.
- Analyze the structure of a paragraph.
- Outline and write a short paragraph with a main idea and supporting details.
- Combine simple sentences correctly.

3 Credits
3 Weekly Lecture Hours

ENG 050 Developmental English
Comprehensive review and writing practice in the fundamentals of English grammar, word choice, punctuation, and paragraph construction. Students may test out of this course at any time in accord with College policy and with the agreement of their instructor. Credits from the course are not applicable toward a degree. The successful Developmental English student should be able to:
- Write a paragraph of substantial length.
- Identifies a sufficiently limited topic.
- Provides a topic sentence containing an appropriately limited subject and controlling idea.
- Demonstrates clear awareness of purpose by using an applicable paragraph pattern.
- Integrates a body of relevant and specific details with a consistent point of view, effective transitions, and a concluding sentence - all elements working to keep the paragraph clearly focused on the topic.
- Applies conventional punctuation, capitalization, spelling and grammar practices regularly enough so as not to frustrate readers or repeatedly distract them from the content of the paragraph.
- Employs a range of sentence variety relevant to audience and purpose.
- Understands that writing is a process and is able to identify and use steps in the process to produce successful paragraphs.
- Recognizes the multi-paragraph essay format and understands its similarities to single paragraph writing.

3 Credits
3 Weekly Lecture Hours

ENG 100 English Composition I
This course reviews the principles of composition, including rhetoric, grammar and usage, and emphasizes the writing of analytical essays and the study of principles underlying critical thinking. Upon successful completion of this course, students should be able to:
- Demonstrate effective writing strategies after reading and assessing a variety of texts.
- Write assignments that consider various writing situations in terms of audience, purpose, tone, organization, format, style, point of view, and diction.
ENG 100 Fundamentals of Journalism I
This writing-intensive course is designed for students contemplating a career in journalism, public relations or advertising. Students will continue to practice newspaperwriting and writing techniques learned in Fundamentals of Journalism I (ENG 130) as well as techniques in copy editing and page layout. In doing so, students will assist in the writing, editing and production of the campus newspaper. Students will also learn to write copy for public relations, advertising and broadcast media. Upon successful completion of the course, students should be able to:
- Write news and feature stories according to AP Style.
- Edit news and feature stories using copy/editing symbols.
- Submit articles electronically to an editor.
- Lay out a newspaper, including photographs and graphic arts.
- Write broadcast copy.
- Write advertising copy.
- Write a news release.
- Create a press kit for a public relations event.
Pre-req. ENG 100 3 Credits 3 Weekly Lecture Hours

ENG 131 Fundamentals of Journalism II
This writing intensive course is designed for students contemplating a career in journalism, public relations or advertising. Students will continue to practice newspaperwriting and writing techniques learned in Fundamentals of Journalism I (ENG 130) as well as techniques in copy editing and page layout. In doing so, students will assist in the writing, editing and production of the campus newspaper. Students will also learn to write copy for public relations, advertising and broadcast media. Upon successful completion of the course, students should be able to:
- Write news and feature stories according to AP Style.
- Edit news and feature stories using copy/editing symbols.
- Submit articles electronically to an editor.
- Lay out a newspaper, including photographs and graphic arts.
- Write broadcast copy.
- Write advertising copy.
- Write a news release.
- Create a press kit for a public relations event.
Pre-req. ENG 100 3 Credits 3 Weekly Lecture Hours

ENG 120 English Composition II
Composition II is a writing course with emphasis on both literature and research. The course develops critical thinking through the study of literature, the use of advanced research techniques, and the writing of analytical/critical and researched essays. Upon successful completion of this course, students should be able to:
- Formulate an analytical/argumentative thesis.
- Express ideas logically and clearly in a coherent essay with sound, supportive data.
- Compose original, analytical/critical essays in response to literature.
- Analyze the short story, poetry and drama using the elements of literature such as plot, setting, character, point of view, form, tone, style, symbolism, and theme, from different critical perspectives.
- Access and evaluate source material using current information literacy skills.
- Summarize, paraphrase, quote and synthesize source material using MLA documentation.
- Apply research skills by composing a multi-source paper that proves a scholarly thesis and is free of plagiarism.
- Revise, edit, and proofread to produce polished, final drafts with a minimum of errors in grammar, mechanics and diction.
Pre-req. ENG 100 3 Credits 3 Weekly Lecture Hours

ENG 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

ENG 205 Creative Writing
Students' written submissions will serve as an experimental means for reinforcing the theory of critical principles described and illustrated in Composition II. Through the written planning of submission, through modifications of planning in response to editorial direction, and through written analysis of their own completed works, students will find that “inspiration” is only the beginning of creative writing. Students’ discussion of submissions in the classroom workshop will evaluate how well a work coincides with its author’s separately submitted analysis, thus emphasizing the value of judging a work on its individual terms rather than by conventional expectation.
Upon successful completion of this course, students should be able to:
- Recognize the logical processes of each work.
- Discuss literary elements such as characterization, theme, narrative stance and symbolism.
- Learn to distinguish essential from non-essential facts in a narrative.
- Write documented papers demonstrating an ability to reach logical conclusions based on given facts.
- Analyze recurrent themes in this fiction, such as “poetic justice,” criminal motivation and the notion of order in society.
Pre-req. ENG 100 3 Credits 3 Weekly Lecture Hours

ENG 214 Women in Literature
Women in Literature is a course that allows students to look at women as they are perceived by others and as they perceive themselves. Through literary creations supplemented by films, speakers, articles and anecdotal contributions from students, we will look at women from a variety of ethnic, social and racial groups, including but not limited to African Americans, Asian Americans, Chicanos and Native Americans. As part of the study of literature by and about women in our world, students will also consider some of the historical, political, economic and religious realities that have shaped and continue to shape our perceptions of women.
Upon successful completion of this course, students should be able to:
- Discuss the roles of women reflected in selected literature.
- Construct a series of response essays that demonstrate a critical analysis of the literature under discussion.
Pre-req. ENG 100 3 Credits 3 Weekly Lecture Hours

ENG 215 Mystery Literature
This course includes conventional detective stories and novels, short stories, films and plays not often analyzed as mysteries. An introduction to logic will be presented, and writers’ use of induction and deduction will be studied. Later forms of detection such as the “hard-boiled” and psychological schools will be placed into the chronology of the genre. The major focus, however, will be on literary elements of each story: each will be evaluated as to narrative stance and structure, methods of characterization, theme and literary devices.
Through reading and analyzing the function of mystery, students should be able to:
- Recognize the logical processes of each work.
- Discuss literary elements such as characterization, theme, narrative stance and symbolism.
- Learn to distinguish essential from non-essential facts in a narrative.
- Write documented papers demonstrating an ability to reach logical conclusions based on given facts.
- Analyze recurrent themes in this fiction, such as “poetic justice,” criminal motivation and the notion of order in society.
Pre-req. ENG 112 3 Credits 3 Weekly Lecture Hours

ENG 216 Science Fiction Literature
Metaphorically, this course is a journey into the strange and at times terrifying possibilities of societies in which technology is out of control. In a sense all of the readings are works of future shock-speculative fiction in which we see technological advancement leading to newer problems, especially of an ethical nature.
Upon successful completion of this course, students should be able to:
- Comment knowledgeably about the literary and popular culture contexts of the readings.
- Identify and comment on the typical devices of dystopian writers (particularly satire, burlesque, caricature and farce).
- Relate these devices to such dystopian themes as conformity vs. individualism, humanistic vs. technological goals.
- Recognize and comment critically on the political, utilitarian and totalitarian abuses of language in dystopian societies.
- Apply research and outlining skills in a project to be presented orally.
Pre-req. ENG 100 3 Credits 3 Weekly Lecture Hours

ENG 220 British Literature to 1800
This is a survey of English literature from the beginnings to the pre-romantics. The emphasis is on the major works and writers.
Upon successful completion of the course, students should be able to:
- Identify historical and cultural characteristics of each of the literary periods.
- Identify literary devices such as image, symbol, irony, conceits, figurative language.

Pre-req. ENG 100 3 Credits 3 Weekly Lecture Hours
ENG 231 American Literature - Romanticism to Skepticism
This course, a continuation of American Literature: Shaping the Ideal, considers literature from 1865 to the postwar period. Upon successful completion of this course, students should be able to:
- Identify various characteristics of post-Civil War American literature.
- Identify various socio-economic, historic and aesthetic influences on the authors and the writing of the period.
- Analyze a work in relation to those forces as well as offer an independent analysis of them.
- Discuss their intellectual or emotional response to a work of the period.
Prereq. ENG 112
3 Credits 3 Weekly Lecture Hours

ENG 240 World Literature I
The selective study of great representative literary works of the world from antiquity to modern times with emphasis on their social, cultural and intellectual backgrounds. Special attention is given to the literature of continental Europe, Asia and Africa.
Upon successful completion of this course, students should be able to:
- Identify the major historical characteristics of the three periods covered (ancient world, the medieval period and the Renaissance).
- List literary form and content that lets us differentiate among the three periods.
- Discuss (both orally and in writing) examples of literature in each period.
- Discuss the influence of early periods on later ones.
- Compare and contrast the characteristics of the three periods.
Prereq. ENG 112
3 Credits 3 Weekly Lecture Hours

ENG 241 World Literature II
Continues the balanced, selective study of great representative literary works of the world from the Renaissance to the present day in their geographical, historical, economic, political and sociological contexts. The “emerging” literatures—works by women, colonials, post-colonials and those groups generally denied a voice—are studied in an attempt to enlarge the canon and render it inclusive.
Upon successful completion of this course, students should be able to:
- Identify the major writers and literary influences of the cultures studied.
- Identify dominant themes/concerns in the established and emerging literatures.
- Recognize the identifying characteristics of the literature of each culture as well as the universals evident in all literatures.
- Demonstrate an awareness of the struggle of writers of the emerging literatures to find a voice, an audience and a hearing.
- Articulate their responses to the cultures and writers encountered in the form of analytical/argumentative, researched and documented essays.
Prereq. ENG 112
3 Credits 3 Weekly Lecture Hours

ENG 242 Bible As Literature
To survey the development and content of the Bible, this course of study includes the historical context and literary style. Upon successful completion of this course, students should be able to:
- Identify and describe the literary style of the Books of the Bible.
- Distinguish the various themes in the Bible.
- Describe the historical and social content of the material.
- Describe the development of the canon.
- Answer comprehensive questions on biblical context.
- Write a paper using the historical critical method.
Prereq. ENG 112
3 Credits 3 Weekly Lecture Hours

ENG 243 Topics in Contemporary Literature
Selected topics and themes from the literature of recent decades, including recent developments in the drama, current movements in modern poetry and the fiction of today.
Upon successful completion of this course, students should be able to:
- Identify various motifs found in modern literature such as wasteland image, fantasy, myth and alienation.
- Discuss such concepts as existentialism, idealism and expressionism as found in modern literature.
- Identify socio-economic and historical influences on the writers.
- Interpret the works according to the writer’s intellectual and emotional response to them.
- Analyze literature in one or more critical research papers.
Prereq. ENG 112
3 Credits 3 Weekly Lecture Hours

ENG 245 Black American Literature
This course is a comprehensive survey of the writings of African Americans beginning with the 18th century through the present. By way of reading, lecture and discussion, students analyze the various genres, topics, modes and traditions identified with African Americans, their historical and cultural significance.
Upon successful completion of this course, students should be able to:
- Discuss the roles of African Americans in the larger culture as reflected in selected literature.
- Trace historical developments among Blacks in America from their African roots through slavery, the Civil War and the industrialized 20th century.
- Analyze literary elements of the works studied.
- Discuss the origins of racial stereotypes, discrimination and segregation as they appear in selected works.
- Write an essay discussing the aforementioned topics.
Prereq. ENG 100
3 Credits 3 Weekly Lecture Hours

ENG 250 Children’s Literature
This course is a critical and analytical study of a variety of texts that represent the many genres of children’s literature. It will emphasize how children are influenced by literature and how children’s literature reflects the values of the particular culture that produces it. Upon successful completion of this course, students should be able to:
- Recognize the characteristics of the different genres of children’s literature.
- Determine and apply criteria for what may be considered as quality children’s literature.
- Analyze literary elements such as theme, character, and setting.
- Evaluate the contributions that illustrations can make to a text.
- Identify literature as a product of a particular cultural climate.
- Discuss critically issues of gender, ethnicity, culture, and the individual that are present in the texts.
- Design and research a written project that relates to a student’s particular interest in children’s literature.
Prereq. ENG 112
3 Credits 3 Weekly Lecture Hours
ESL 023 Elementary Grammar
This is a high beginning multi-skills course to practice and learn grammar in listening, speaking, reading and writing for everyday life and in college. Students must take this course with other ESL skills courses in writing (ESL 024), reading (ESL 025) and listening/speaking (ESL 026).

Upon successful completion of the course, students should be able to:
- Use the simple present, past and future tenses of regular and irregular verbs.
- Use with accuracy the present and past continuous, and the present perfect tenses.
- Understand and use yes/no and wh- questions.
- Produce and use sentences with if, when, after, before, because and while with correct verb tenses.
- Use models of ability, request and necessity.
- Use with accuracy prepositions of time, place, pronouns and count/non-count nouns.
- Use with some accuracy comparisons and superlatives.
- Learn and use language confidently and appropriately.

Prereq. Placement Test
3 Credits 3 Weekly Lecture Hours

ESL 024 Elementary Writing
This course is for advanced beginners who can write basic sentences and have some knowledge of English sentence structure. The course covers basic grammatical structures and introduces students to simple paragraph writing as well as other types of writing needed in everyday life.

Upon successful completion of the course, students should be able to:
- Write simple, clear sentences with correct capitalization and punctuation.
- Write simpler forms of compound and complex sentences with appropriate linking words.
- Write unified paragraphs of 8 to 10 sentences about people, places and events.
- Collect and organize information for use in sentence writing.
- Recognize and identify the basic parts of speech in writing using the correct dictionary abbreviations.
- Use the basic verb tenses to indicate present, past and future time.
- Use the common models and prepositions of time and location correctly.
- Develop some skill in recognizing and correcting common writing errors.
- Show improved ability to use correct word endings and articles.

Prereq. Placement Test
4 Credits 3 Weekly Lecture Hours

ESL 025 Elementary Reading
This advanced-beginner course is designed to develop students’ ability to use reading strategies and to expand vocabulary in order to understand simplified texts. Students will normally take this course with Elementary Writing (ESL 024) and Elementary Speaking/Learning (ESL 026). Two hours per week of tutoring are required. In the course, students should be able to:
- Read text appropriate for this level.
- Respond to questions and organize information from readings into simple outlines and grids.
- Find main ideas, topic sentences and details.
- Predict content by asking questions before reading.
- Use strategies to infer the meaning of vocabulary, decode difficult sentences, and interpret punctuation and connectors.
- Skip and scan for information.
- Expand vocabulary.
- Use an English-English dictionary for ESL learners.

Prereq. Placement Test
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

ESL 026 Elementary Listening/Speaking
This is a course for advanced beginners who have some basic knowledge of English and some functional communicative ability (e.g., simple questions and answers on topics of everyday interest). Class time is devoted to speaking for everyday needs, grammar practice, pronunciation, intensive listening to short, simplified narratives and listening for specific information in extended narratives and conversations. Students normally take this course along with Elementary Writing (ESL 024) and Elementary Reading (ESL 025). The course also has two hours of lab time, which will provide students with additional listening practice.

Upon successful completion of the course, students should be able to:
- Ask and answer questions about their own life situations.
- Use courtesy in various everyday situations.
- Describe or narrate an event using two or more sentences.
- Learn the sound system of English, and practice pronunciation and intonation.
- Develop strategies to understand information necessary for everyday life (e.g., weather forecasts).
- Understand simplified, extended narratives (e.g., lectures and dialogues).

Prereq. Placement Test
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

ESL 033 Intermediate Grammar I
This course is a continuation of Elementary Grammar (ESL 023). Students practice grammatical structures through reading, writing, speaking and listening tasks in a classroom setting. This course is helpful for students who are fluent in English, but who need to develop the accuracy that is necessary for success in college. The course is also recommended for new international students who may have memorized grammar rules, but cannot apply them in conversational or academic situations.

Upon successful completion of this course, students should be able to:
- Use with accuracy the past perfect and future perfect verb tenses.
- Use with accuracy the present, past and future tenses in reported speech and conditional time (real and unreal).
- Apply accurately the passive, gerund and infinitive forms of verbs.
- Use models expressing possibility, ability and permissibility accurately.
- Produce adverb, noun and adjective clauses accurately.
- Use strategies to detect and correct grammatical errors.

Prereq. ESL 023
3 Credits 3 Weekly Lecture Hours

ESL 034 Intermediate Writing I
This course is a continuation of Elementary Writing (ESL 024). Students write longer paragraphs and short essays using more advanced writing strategies such as narration, illustration and analysis. Frequent in-class writing and out-of-class assignments help prepare students for future academic writing in non-ESL classes.

Upon successful completion of this course, students should be able to:
- Write compound and complex sentences with correct capitalization and punctuation.
- Use perfect tenses, real conditionals, models, passive constructions, gerunds and infinitives.
- Use consistent verb tenses, pronouns and transitional connectors to link ideas.
- Use subordination to combine short sentences and to emphasize important ideas.
- Write short essays of 300 words using several well-supported paragraphs.
- Use description, narration, explanation and comparison.
- Generate and organize ideas using a number of pre-writing strategies.
- Take effective notes showing main ideas and important details.
- Develop skill in revision and process writing in a portfolio of written work.

Prereq. ESL 024
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

ESL 035 Intermediate Reading I
In this course, students expand their reading skills and vocabulary. Students should take this course along with Intermediate Writing I (ESL 034) and Intermediate Speaking/Learning I (ESL 036). In addition, two hours of tutoring work are required weekly.

Upon successful completion of this course, students should be able to:
- Read text appropriate for this level.
- Predict content, respond to questions, defend answers and restate the content of readings.
- Make inferences based on the readings.
- Infer the meaning of vocabulary, decode difficult sentences and interpret meaning.
- Recognize the organization and structure of readings.
- Scan for information in maps, charts, graphs, etc.
- Expand vocabulary and knowledge of word forms.
- Use an English-English dictionary for ESL students.

Prereq. ESL 025
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

ESL 036 Intermediate Listening/Speaking I
This course is a speaking and listening course for low-intermediate ESL students. Students entering the course should be able to answer questions about their own lives, to expand a spontaneous narrative to three or four sentences. Class time is devoted to speaking in various social situations, the practice of grammar, pronunciation and listening for information in conversations and extended narratives. Students normally take this course with Intermediate Writing I (ESL 034) and Intermediate Reading I (ESL 035). Two hours of lab time weekly give students additional listening comprehension practice.

Upon successful completion of the course, students should be able to:
- Use language functions appropriate for this level (e.g., requesting information, agreeing, complimenting).
- Use language at different levels of politeness and formality.
- Give short talks on topics of interest.
- Learn and practice the pronunciation and intonation patterns of English.
- Comprehend simplified lectures on academic topics.
- Identify information in conversations and narratives.
- Learn and produce common reductions in English.

Prereq. ESL 026
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours
ESL 043 Intermediate Grammar II
This course is a continuation of Intermediate Grammar I (ESL 033). It is a multi-skills course in which students practice grammar in social and academic situations. Upon successful completion of the course, students should be able to:
• Use with accuracy the past perfect continuous and future perfect continuous tenses.
• Use with accuracy adverb, noun and adjective clauses.
• Use tools such as connectors, tense shifting and reference words in extended writing.
• Produce and use models with accuracy.
• Select appropriate grammatical constructions for different levels of formality.
• Use language confidently and appropriately.
Prereq. ESL 033
3 Credits 3 Weekly Lecture Hours

ESL 044 Intermediate Writing II
This course is designed for students who can write unified, well-supported paragraphs and short essays with few errors that affect readers' comprehension. Upon successful completion of this course, students should be able to:
• Gather and organize information and ideas required for essay writing.
• Write essays for a variety of purposes and audiences.
• Identify and produce writing assignments appropriate for specific audiences.
• Use a variety of complex sentences.
• Use pronouns and transitional devices to link ideas.
• Use unreal conditionals, noun clauses and other advanced structures for sentence variety and effect.
• Proofread and revise papers in response to instructors'/peers' comments.
• Demonstrate in a portfolio the academic writing skills required in non-ESL credit courses.
Prereq. ESL 034
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

ESL 045 Intermediate Reading II
This course is designed for intermediate-level ESL students who need to build their vocabulary and reading skills so that they can, with the assistance of a dictionary, understand text that is written for native speakers. Students will normally take Intermediate Writing II (ESL 044) and Intermediate Speaking/Listening II (ESL 046) along with this course. In addition, two hours weekly of tutoring are required. Upon successful completion of this course, students should be able to:
• Use a variety of reading strategies to interpret meaning.
• Summarize and paraphrase, verbally and in writing, information contained in the readings.
• Discuss the content of readings and defend answers.
• Expand vocabulary, knowledge of word forms and use of idiomatic expressions.
• Demonstrate knowledge of roots, prefixes and suffixes.
• Use an English-English dictionary for advanced ESL learners.
Prereq. ESL 035
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

ESL 046 Intermediate Listening/Speaking II
This course emphasizes the comprehension and production of longer segments of speech. Students entering the course should be able to extend a narrative to several sentences. The class covers speaking in everyday situations, conventions of speaking in academic settings (e.g., participating in class discussions) and pronunciation. Students normally take this course with Intermediate Reading II (ESL 045) and Intermediate Writing II (ESL 044). An additional two hours each week of lab time will provide extra listening practice.
Upon successful completion of this course, students should be able to:
• Use different levels of politeness in a variety of situations. Speak spontaneously at an extended level of discourse.
• Organize and deliver a five to seven minute presentation.
• Contribute to group problem-solving discussions.
• Use listening strategies to understand the main points in longer narratives and conversation, some unsimplified.
• Take notes on extended narratives.
• Improve pronunciation and intonation.
• Demonstrate grammatical accuracy in most everyday conversational situations.
Prereq. ESL 036
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

ESS 100 Earth Science
This course is a general survey of the earth sciences of geology, meteorology, oceanography, and astronomy in the context of natural hazards and disasters. There is an emphasis on understanding, predicting, avoiding, and preventing these disasters. The course is intended for non-science majors interested in the earth sciences and how they relate to human activity. Upon successful completion of this course, students should be able to:
• Describe how damage from natural disasters can be predicted, avoided, or prevented by good decision-making.
• Explain the theory of Plate Tectonics and its role in describing earthquakes, volcanoes, and tsunamis.
• Discuss the causes of mass wasting, ground collapse, flooding, and beach erosion.
• Apply concepts describing climate and weather to hurricanes, tornadoes, thunderstorms, and wildfires.
• Describe the threat caused by asteroids.
• Apply laboratory skills and computer technology to solve problems in a cooperative environment.
Prereq. ENG 050 and REA 050
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

ESS 102 Introduction to Astronomy
This course is designed to introduce students to the science of astronomy. Its history, and its importance as an influence on our view of humankind. The course is intended for non-science majors. An optional laboratory course, ESS 103 Introduction to Astronomy Laboratory, is offered at night. Upon successful completion of this course, students should be able to:
• Describe the night sky, the model used to represent it, and the motions of the sun, moon, and planets across it.
• Trace the history of astronomy and the individuals and ideas that have shaped our view of the universe.
• Describe the form in which information from the universe reaches astronomers, how the information is created, the tools used in astronomy to gather it, the concepts used to analyze it, and how the information is used to classify and study stars such as the sun.
• Describe the important properties of stars, the methods by which astronomers measure those properties, and discuss the theories relating to stellar birth and evolution.
• Describe the general characteristics of the solar system, the theories about its origin, how those theories are supported by observational evidence, and how the planets compare with one another in terms of their physical characteristics.
• Discuss the discovery and nature of the Milky Way Galaxy, the different types of galaxies, their creation, organization, distribution, and motions in space, and how galaxies are used to develop theories regarding the evolution of the universe.
• Discuss the possibility of life existing elsewhere in the universe, what is presently known about the origins of life and suitable places for life to exist, and describe the observational evidence for or against life in the universe.
Prereq. ENG 050 and REA 050
3 Credits 3 Weekly Lecture Hours

ESS 103 Introduction to Astronomy Laboratory
This laboratory course introduces students to astronomical observations through the use of telescopes and star charts to study objects in the night sky. Practical indoor activities are designed to foster an understanding of how objects from great distances are studied from the earth. Observations of the night sky with telescopes and the unaided eye will be conducted. Students will explore the constellations, moon, planets, and other objects of our universe. The course is intended for non-science majors, and is an optional laboratory course to accompany ESS 102 Introduction to Astronomy. Upon successful completion of this course, students should be able to:
• Identify stars, planets and constellations using the star charts.
• Demonstrate proper use of telescope by reference to star charts.
• Locate stellar objects with a telescope by reference to star charts.
• Describe the nightly and annual motions of the moon, stars and planets.
• Locate current information in journals and astronomical literature in the library.
• Demonstrate the use of computer information systems such as Internet to collect and study recent data on astronomical events.
• Describe several ways in which astronomers measure distance to stars.
• Develop skills that can be used in life-long learning to understand the composition of our universe.
Prereq. or Coreq. ESS 102
1 Credit 2 Weekly Laboratory Hours

ESS 110 Geology
This course is designed for Natural Science majors program although it will be appropriate for non-science majors as a laboratory science elective. The course provides an introduction to the study of the Earth, its composition, and the processes that shape it. The course will consider the various aspects of geology including earthquakes, volcanoes, surface and groundwater, rivers and streams, caves, landform development, plate tectonics, rocks, and minerals. Upon successful completion of this course, the student should be able to:
• Identify volcanism, igneous activity, and the formation of igneous rocks.
• Describe the processes of weathering, erosion, sedimentation, and the formation of sedimentary rocks.
• Explain the basic ideas of metamorphism and the formation of metamorphic rocks.
• Define the mechanism and effects of earthquakes.
• Summarize the theory of plate tectonics.
• Apply the plate tectonic theory to mountain building, volcanism, and earthquakes.
• Compare surface water and groundwater, and explain the role of each in the human environment.
• Describe the socioeconomic impact of geology.
FRE 101 Elementary French I
The basic principles of pronunciation and grammar of the French language are emphasized. Vocabulary dealing with everyday situations is covered. Listening and speaking skills are developed through laboratory practice and increased use of French in the classroom.

Upon successful completion of this course, students should be able to:
- Reproduce with reasonable accuracy the sounds of the language.
- Respond in French in a satisfactory manner to basic conversational situations.
- Produce appropriate pattern and sentence transformation.
- Write in dictation form with a reasonable degree of accuracy from materials that have already been studied.
- Recall facts and observations of cultural interest.

Fewer than two yrs H.S. French
3 Credits 3 Weekly Lecture Hours

FRE 102 Elementary French II
This course stresses progress in the speaking, writing, and reading skills begun in FRE 101 and promotes greater understanding of French culture. The mandatory use of laboratory tapes further develops listening and speaking skills.

Upon successful completion of this course, students should be able to:
- Demonstrate an increased understanding of the principles of good pronunciation.
- Show some facility in responding to familiar questions and requests given in French.
- Demonstrate in reading and writing an understanding of grammatical concepts previously presented.
- Exercise control of a larger vocabulary.
- Write in dictation form from familiar texts.
- Recall facts of culture contrasts shown in assigned reading.

Prereq. FRE 101 or 2 yrs. H.S. French
3 Credits 3 Weekly Lecture Hours

FRE 111 Intermediate French I
Review of the basic sounds of the French language, first-level vocabulary and grammatical content. Introduction of new language concepts and more advanced vocabulary and idioms. Weekly laboratory practice to strengthen understanding of fluent speech.

Upon successful completion of this course, students should be able to:
- Demonstrate the ability to read directly in French with increasing attention to correctness of sounds, rhythm, accentuation and intonation.
- Represent a representative number of the dialogue situations previously illustrated.
- Demonstrate correct use of essential grammatical and idiomatic structures previously presented.
- Produce original coherent sentences and short paragraphs.
- Write familiar texts by dictation.
- Identify patterns of cultural behavior or customs that have been presented in class discussions.

Prereq. FRE 101 or equiv.
3 Credits 3 Weekly Lecture Hours

FRE 112 Intermediate French II
Focus on understanding new language principles and the identification of these concepts in reading and writing. Reading in French from a variety of practical, cultural and literary texts. Frequent listening and speaking practice. Weekly laboratory exercises for better understanding of fluent French.

Upon successful completion of this course, students should be able to:
- Respond in French with reasonable accuracy and clarity to questions within the scope of the course.
- Read directly and accurately in the language at a level comprehensible to one fluent in French.
- Reconstruct or significantly modify learned responses or conversational patterns.
- Write coherent sentences and short paragraphs that use grammatical elements previously illustrated.
- Write in dictation form from class materials studied.
- Show some familiarity with French language contributions to the Western World and/or with cross-cultural contributions encountered in the course.

Prereq. FRE 111
3 Credits 3 Weekly Lecture Hours

FST 101 Principles of Fire Science Administration
Fire-Science Administration details the skills and techniques necessary for proper management of all aspects of fire service.

Upon successful completion of this course, students should be able to:
- Delineate the scope of management principles.
- Apply managerial functions to various positions in fire service.
- Explicate behavioral science aspects in management application.
- Detail managerial skills to achieve organizational needs.
- Assess a management-by-objective program in a fire service.
- Detail the objectives of fire prevention and the fire-inspection process.
- Outline and use pre-fire planning.
- Describe personnel management.
- Depict sound training techniques for fire personnel.

3 Credits 3 Weekly Lecture Hours

FST 102 Fire Prevention Theory and Application
This course is designed to cover the basics of the development of fire-prevention laws and ordinances for elimination of fire hazards; inspection, organization, practices and procedures. Theory and application of laws and ordinances in modern concepts of fire prevention are also covered.

Upon successful completion of this course, students should be able to:
- Organize a viable fire-prevention program.
- Trace the development of the science of fire prevention.
- Explicate the Fire Prevention Code.
- Conduct a thorough fire safety program.
- Maintain accurate records and reports via the Systems Analysis method.
FST 202 Fire Systems in Industry
This course is designed to acquaint students with the various aspects of private fire protection, from designing the physical facilities to instituting safety factors to extinguishing configurations.
Upon successful completion of this course, students should be able to:
• Assess occupational opportunities in industrial fire protection.
• Delineate the management responsibilities concerning property conservation.
• Detail the traits needed in and responsibilities of a director of property conservation.
• Depict the procedures required to begin a property conservation program.
• Provide the minimal functions required of the plant emergency organization.
• Establish a viable watch service.
• Classify the various types and components of sprinkler systems.
• Describe the advantages of each of the four basic types of alarm systems.
• Preplan for the normal property conservation emergency situations.
3 Credits 3 Weekly Lecture Hours

GER 102 Elementary German II
This course stresses progress in the speaking, writing and reading skills begun in GER 101 and promotes understanding of German culture. The mandatory use of laboratory tapes further develops listening and speaking skills. Upon successful completion of this course, students should be able to:
• Respond in German to a representative number of daily situations.
• Produce with more accuracy the phonetic sounds of the language.
• Read familiar prose aloud in a manner acceptable to the fluent speaker.
• Carry out an oral request made in German.
• Demonstrate increased command of vocabulary and elements of grammar.
• Briefly express ideas on a given topic.
• Recall familiar facts of German civilizations from reading assignments.
Prereq. GER 101
3 Credits 3 Weekly Lecture Hours

(GRA) Graphic Design
GRA 110 History of Graphic Design
This course surveys the field of graphic design and visual communications from the earliest written languages through contemporary graphic design practice. The course will help the student develop a visual vocabulary, introduce major design figures and movements, provide a historical context for design throughout and practice while emphasizing the design profession as an artistic discipline.
Upon successful completion of this course, students should be able to:
• Analyze and identify the stylistic distinctions among the various historic design movements.
• Explain the techniques and tools used in the various design movements.
• Define the technical terms associated with the graphic design industry.
• Identify cultural changes that affected the visual appearance of various design movements.
• Identify important historical artist/designers that contributed to the various historic design movements.
Prerequisite: Satisfactory scores on placement tests in English and Reading, or successful completion of Developmental English (ENG 050) and Developmental Reading and Study Skills (REA 050).
3 Credits 3 Weekly Lecture Hours

GRA 121 Three-Dimensional Design
Lines, planes and volumes are explored with materials that have intrinsic qualities for three-dimensional forms. Studio experience may include paper, wood, plasteline, metal and related media.
Upon successful completion of this course, students should be able to:
• Explore modular construction using simple geometric volumes.
• Use positive and negative volumes to complicate geometric structure.
• Acquire tactile sensibilities through the manipulation of a variety of materials.
• Use repetition, rhythm and variation in 3 dimensional compositions.
• Consider 3-D properties of dimension, lighting and environmental space.
Prereq. GRA 122
3 Credits 3 Weekly Lecture Hours
GRA 122 Two-Dimensional Design
This introductory course for graphic design majors centers on the principles of two-dimensional design in black and white and grayscale. Line, shape, space, and value are explored as elements of visual language. Problem solving begins in the studio and continues through outside assignments. Analysis through individual and group critiques allows students to develop an analytical attitude and a clearer vision of design concepts. Upon completion of this course, the student should be able to:
- Use placement and orientation to create meaning and expressive content with a given format.
- Identify and define principles of gestalt and design.
- Rearrange elements to change the meaning and expressive content.
- Organize compositions using directional lines and basic geometric shapes to convey/change meaning.
- Apply the concept of positive and negative space to black and white designs.
- Manipulate figure/ground relationship to change meaning and expressive content.
- Employ a value scale in creating compositions.
- Work through from thumbnails or rouges (preparatory sketches) to presentation pieces.
- Demonstrate competence with tools and materials, both wet and dry.
- Use the library and resource material to research and enrich design ideas.
- Discuss and employ the contents of individual and group critiques to bring work to successful conclusion.

3 Credits 3 Weekly Lecture Hours

GRA 123 Color and Design
This second-semester course for graphic design majors focuses on color theory and its relationship to design. Problems in color mixing and color grouping are studied and solved through studio and outside assignments. Individual and group critiques continue as a means of refining analytical thinking and of developing a vocabulary to express design concepts. Upon successful completion of this course, students should be able to:
- Demonstrate the ability to group colors by temperature, intensity and value.
- Demonstrate the theory of color interaction using paper and pigment.
- Change the meaning/expressive content of an image through color variation.

Pre req. GRA 122
3 Credits 3 Weekly Lecture Hours

GRA 133 Drawing I for Graphic Design Majors
This course for Graphic Design Majors is intended for the student who wishes to pursue advanced study or a career in the visual arts. Lines, planes, and volumes are explored as elements of form. Analytical line and tone are the languages used in this pursuit. A variety of media will be used with an emphasis on pencil and charcoal.

This class is designed to develop perceptual, technical, and creative skills through problem solving. Upon successful completion of this course, students should be able to:
- Use line to describe geometric form with accuracy of measure - size, scale, proportion, and location.
- Use variation in line weight to indicate closeness and distance.
- Use the vocabulary of the emerging quality of line to suggest spatial relations to the picture plane.
- Use axes, placement lines, and tracking lines to compose with accuracy.
- Understand the rudiments of composing.

3 Credits 3 Weekly Lecture Hours

GRA 134 Drawing II for Graphic Design Majors
Drawing II, a course intended for Graphic Design majors, is an extension of Drawing I (GRA 133), it will continue to stress accurate drawing, but with a shift in emphasis. Students are introduced to an increased variety of media such as wash and Conte’ crayon. The subject matter will shift from that which tends to be geometric to the organic.

Upon successful completion of the course, students should be able to:
- Draw the human figure from a life model.
- Organize compositions within the format for expressive content.
- Manipulate spatial arrangements to change meaning.
- Employ textural qualities to add variety and realism.

Pre req. GRA 133
3 Credits 3 Weekly Lecture Hours

GRA 136 Drawing as Design Process
This course is a second semester drawing course intended specifically for GRA majors going directly into the work force upon graduation. This course will focus on specific freehand drawing skills needed to be successful in the daily requirements of the advertising and commercial design fields through structural analysis of man-made and natural forms. The elements of line, shape, value and spatial organization will be stressed to develop drawings suitable for inclusion in the student’s design portfolio.

Upon successful completion of this course, students should be able to:
- Draw from observation using elementary forms and linear methods to achieve structure.
- Analyze proportion and form to build complex geometric forms.
- Create drawings using one-point, two-point, three-point and intuitive perspective techniques.
- Employ the value scale to achieve volume and mass.
- Apply rapid ‘visualization processes to draw objects from memory.
- Produce finished "symbol" drawings through the process of icon translation.

Pre requisites: Drawing I for Graphic Design Majors (GRA 133) Pre req. GRA 133
3 Credits 6 Weekly Lecture Hours

GRA 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the "Options for Earning College Credit" section of the catalog.

GRA 205 Mac Literacy
This introductory-level course is intended for those using computers in an Apple Macintosh environment. Students will learn basic computer operations, applications, utilities and troubleshooting skills. This course is self-paced with the aid of an instructor and hands-on experience.

Upon successful completion of this course, students should be able to:
- Demonstrate a basic knowledge of Macintosh computer systems and terminology.
- Use basic file management skills to organize disk drives, folders and documents.
- Define and explain the differences between various computer file formats.
- Define and explain the differences between various page description languages and printer types.
- Identify and describe hardware and media used for archival storage of computer files.
- Perform fundamental operations of a text-entry application.
- Perform routine maintenance procedures on computer graphics workstations.
- Research and evaluate computer hardware and software for purchasing decisions.
- Perform fundamental operations within an imaging, illustration and page layout application.

3 Credits 3 Weekly Lecture Hours

GRA 208 Computer Illustration
This course is an introduction to the computer as a drawing and design tool. An object-oriented drawing program is introduced with hands on computer instruction. Basic vector graphic techniques, organizing the components of an illustration, printing Postscript proofs, text entry and formatting, color mixing and palette organization, color proofing and special path operations are stressed. In this course, students should gain an understanding of using computers for the creation of drawings and illustrations. Students will be given hands-on instruction on Apple Macintosh computers using industry standard drawing software.

Upon successful completion of this course, students should be able to:
- Choose appropriate menus and commands in order to create and modify object-oriented drawings.
- Control fills, strokes, position and orientation of vector object.
- Organize drawings using layers.
- Print Postscript graphic files on a black and white laser printer.
- Control and manipulate Bezier curves and paths.
- Create color palettes and choose appropriate color matching systems.
- Format text using typographic controls.
- Print Postscript graphic files on a color printer.

Pre req. GRA 205; GRA 133 and GRA 122
3 Credits 3 Weekly Lecture Hours

GRA 211 Digital Imaging
This course introduces the use of bitmap image editing software for the creation of bitmap, grayscale and color imagery. Special attention is given to scanning images, resolution formulas, appropriate file formats for use in graphic applications, color correction, organization of images, printing and prepress production and color management are covered. In this course, students should gain skills in critical color comparison and manipulation and understand the process of preparing graphic files for production. Students will be given hands-on instruction on Apple Macintosh computers using industry standard imaging and scanning software.

Upon successful completion of this course, students should be able to:
- Demonstrate mastery of using the basic menus, commands and palettes of an image-editing program.
- Manipulate color formulas and articulate the differences between color modes.
- Operate a flatbed scanner to input line art grayscale and color images and choose appropriate resolutions for each.
- Manipulate scanned images for direct output or export to other types of graphic programs.
- Use color correction functions to improve the quality of scanned images.
- Print proofs to a color printer for color composition and correction.
GRA 213  Page Layout
This course covers the fundamentals of using computer-based publishing software. Students complete several activities and tutorials in order to create a variety of simple documents that integrates type and graphics. Advanced features of computer-based publishing software for the production of multi-page color documents will be covered. In this course, students gain an understanding of using the computer for the creation of publication design. Students will be given hands-on instruction on Apple Macintosh computers using industry standard publication software.

Upon successful completion of this course, students should be able to:
- Demonstrate mastery of using the basic menus, commands and tools of a page layout program.
- Select, specify and copy text and display type using correct terminology.
- Import and edit text imported from a word processing program.
- Apply character and paragraph style formatting to text.
- Customize and wrap text flow.
- Import, crop and scale graphic elements.
- Create master pages.
- Create multiple-page publications integrating text, bitmapped and object-oriented graphics.
- Utilize style sheets, master pages and templates to organize complex documents.
- Utilize color-matching systems.
- Apply appropriate file management techniques for prepress.
- Prepare a multiple-page document for output from a service bureau.

Prereq. GRA 208 and GRA 211
3 Credits 3 Weekly Lecture Hours

GRA 215  Typography
This intermediate level course for graphic design majors concerns itself with the characteristics and design applications of type used in printed and digital matter. Students plan and produce a series of portfolio-quality projects to explore the use of type as a design element. Course work includes lecture, computer lab and class discussion and critique.

Upon successful completion of this course, students should be able to:
- Use the principles of positive/negative space, rhythm, texture and composition in manipulating letterforms as design elements.
- Select appropriate typefaces that enhance verbal messages.
- Identify and categorize commonly used type families.
- Employ letter, word and line spacing that enhance the appearance and readability of type.
- Use appropriate comping methods to indicate text and display type in a layout.
- Arrange and assemble display and text in a page layout relating it to other design elements.
- Apply typographic hierarchy to organize a page layout.

Prereq. GRA 123 and GRA 208
3 Credits 3 Weekly Lecture Hours

GRA 225  Pre-press and Printing Process
In this course you will investigate digital file composition and the use of computing technology as it applies to the preparation of digital files for the printing industry. Printing and binding methods used to reproduce the work of the graphic designer will be studied. Technical, time and budget constraints are emphasized in order to relate design and production costs to real-world situations. Students will gain hands-on experience with a variety of graphics hardware and software commonly used for computer prepress. Course work includes lecture, demonstration, case study, field trips, projects and discussion. Upon successful completion of this course, the student should be able to:
- Define design objectives and how work flows thru the imaging process.
- Identify and define line art and halftone reproduction processes.
- Identify and define the most commonly used proofing methods and color systems.
- Identify, characterize and select appropriate paper stock for various types of printing jobs.
- Define and differentiate between the various commercial-printing methods.
- Identify and define printing-related processes such as engraving, embossing, diecutting, foil stamping and the most commonly used bindery methods.
- Identify and list the advantages, disadvantages and capabilities of different storage media and use of file compression utilities for file transfer and storage.
- Perform font management activities.
- Understand, use and apply calibration techniques to computer monitors and desktop scanners.
- Apply troubleshooting techniques to hardware and software problems.
- Output digital files on Postscript and non-Postscript printers.

Prereq. GRA 208, GRA 211 and GRA 218
3 Credits 3 Weekly Lecture Hours

GRA 227  Web Graphics
This course introduces students to the design of web pages and user-interaction and application for the World Wide Web (WWW). The focus of this course will be functional design that encourages, enhances and simplifies the web browsing experience. Students learn to design effective user interfaces using image editing software, Hypertext Markup Language (HTML) editors and other web development software. Students will explore interface theory, design principles and develop hands-on experience creating visually exciting web pages.

This course is intended for students wishing to pursue a career or advanced study in graphic design as it relates to design of web graphics and their interaction. Upon successful completion of this course, the student should be able to:
- Employ the theory and principles of effective user interface design.
- Apply basic design principles to the structure of HTML formatted web documents with emphasis on the visual aesthetic.
- Organize effective navigation between various interface designs.
- Apply basic HTML hard-coding to web documents using visual editing software.
- Use image-editing software to produce efficient web graphics.
- Use a professional quality visual educator to develop and maintain web documents and sites.
- Transfer files to a server using File Transfer Protocol (FTP)

Prereq. GRA 213 and GRA 215
3 Credits 3 Weekly Lecture Hours

GRA 228  Motion Graphics
This advanced-level course for graphic design majors is an introduction to the design of motion graphics for web and multimedia applications. Students will learn to design effective timeline sequences incorporating vector-drawing techniques, tweening, frame-by-frame animation procedures, bitmap imagery, typographic techniques and basic scripting. Design theory for interactive media is coupled with hands-on experience for creating visually rich animations, web pages and presentations.

This course is intended for students who desire intermediate-level study in animation and time-based motion graphics. Upon successful completion of this course, the student should be able to:
- Develop a storyboard for time-based media.
- Design vector objects and raster images for motion graphics with emphasis on the visual aesthetic.
- Create basic animation sequences using vector-drawing tools.
- Execute frame-by-frame animations using a timeline.
- Implement tweening properties.
- Script basic commands for interactivity.
- Design a user-friendly environment.
- Create and utilize sound in a movie file.
- Deliver optimized movies to appropriate audiences.

Prereq. GRA 213, GRA 215
3 Credits 3 Weekly Lecture Hours

GRA 230  Graphic Design I
This is an intermediate level course for graphic design majors. Through a series of projects, students learn to employ basic design concepts in solving different types of visual communications problems.

Upon successful completion of this course, students should be able to:
- Combine type and image in a layout to communicate an idea or message.
- Interpret and represent an idea by means of a mark or symbol.
- Interpret advertising copy and incorporate it in a design.
- Demonstrate visual gestalt principles in solving a design problem.
- Use traditional graphic design tools and techniques to develop a design concept from sketch to tight comprehensive layout.
- Evaluate visual solutions to design problems verbally and in writing.

Prereq. GRA 123, GRA 208, GRA 211
3 Credits 3 Weekly Lecture Hours

GRA 231  Graphic Design II
This course is a continuation of Graphic Design I. In this course students refine skills and work habits related to the creative process for solving visual communication problems. Projects emphasize the development of design priorities and alternatives based on client need and production constraint.

Upon successful completion of this course, students should be able to:
- Write a design brief.
- Apply basic design principles to the organization and use of type, color and composition in a multi-page publication.
- Develop a simple corporate identity system.
- Design and mock-up a basic package design.
- Solve a simple interface design problem.
- Present a design project to a client both verbally and visually.

Prereq. GRA 213 and GRA 220
3 Credits 3 Weekly Lecture Hours

GRA 232  Portfolio Seminar
This advanced-level course for graphic design majors covers the creation and selection of art work required in job, college transfer and co-op interview situations. Course work includes lecture, studio activities, class critique and discussion. Along with independent study.
Upon successful completion of this course, students should be able to:

- Select, critique and refine a body of personal artwork that represents a range of artistic abilities and media.
- Mount and present artwork in a professional manner.
- Create a logical sequence for personal artwork presentation.
- Examine and select portfolio pieces appropriate for a specific audience.
- Photograph both two and three-dimensional work on color slide film or digital media.
- Select a portfolio format (digital, slide, original work) appropriate for a specific audience.
- Design and produce a self-promotional leave-behind.
- Write and design a resume or intention letter.
- Define and solve a design problem that exhibits integration of studio skills from several courses.
- Make a portfolio presentation to a small group outlining project objectives, methods and materials.

Prereq. 28 cr in GRA discipline Coreq. GRA 231

3 Credits 3 Weekly Lecture Hours

(HIS) History

HIS 100 American Civilization

American civilization from colonial times to the present is an articulated study, but general in focus, of the history of the United States. The course as a whole is designed to give students a broad foundation on the following topics in American civilization: history, literature, economics, political science, religion, art and architecture.

Upon successful completion of this course, students should be able to:

- Analyze and explain the causes and results of the following wars: Revolutionary, War of 1812, the Civil War, and World Wars I and II.
- Examine and evaluate the major American writers and their works.
- Describe the growth of the American economy and labor from colonial times to the present.
- Analyze the principal political ideologies in American society.
- Discuss the role of religion in the colonization of the New World and its impact on American society today.
- Be familiar with the variety of American art and architecture.

3 Credits 3 Weekly Lecture Hours

HIS 110 American History I

An inquiry into the history of the United States from our country’s European beginnings through the period of reconstruction following the Civil War. Includes the periods of European exploration, Colonial America, the American Revolution, Confederation and Constitution, Federal and Republican, Jacksonian, Manifest Destiny, Sectionalism, the Civil War and Reconstruction.

Upon successful completion of the course, students should be able to:

- Assess the causes and effects of major U.S. wars on the growth and development of the country.
- Trace the evolution of U.S. political structures through reconstruction, using important documents as evidence.
- Explain the growth of social complexity in U.S. society.
- Identify the dominant values in American society through specific eras (Colonial, Jeffersonian, Jacksonian, and Antebellum, Reconstruction).

Prereq. ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours

HIS 120 American History II

Continues the inquiry into the history of the United States from the Reconstruction era to the present day. Includes post-Civil War politics, the Western frontiers, industry and labor, imperialism, the arts and sciences, progressive era, World War I, post-war prosperity and depression, New Deal, policy and diplomacy, World War II, the Cold War, Vietnam, civil rights struggle, and the 1970s and 1980s.

Upon successful completion of this course, students should be able to:

- Differentiate the impact of industrialization on the population of self-sufficient farmers; blacks, “old” and “new” immigrants, workers and business people.
- Trace the illusion of isolation and the practice of imperialism as the nation moved from nationalism to internationalism between 1865 and contemporary times.
- Characterize the methods of reform used by the radical republicans, populists, progressives, New Dealers, and in the post-World War II era.
- Evaluate the involvement and effectiveness of the U.S. in World War I, II and the Cold War.

Prereq. ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours

HIS 130 Western Civilization I

An evaluation of the history of the Western world from its beginnings to the Renaissance and Reformation. Examines the civilizations of the ancients, early Christian times, the feudal world, the European Middle Ages, the Renaissance and Reformation.

Upon successful completion of this course, students should be able to:

- Evaluate the impact of the ancient near Eastern cultures on the development of Western civilization.
- Analyze the political, social, philosophical and artistic achievements of the Greco-Roman civilization.
- Explicate the cultural dynamic that shaped Western Europe between the 5th and 15th centuries.
- Explain the impact of the Renaissance and the Reformation on the evolution of Western culture.

3 Credits 3 Weekly Lecture Hours

HIS 140 Western Civilization II

Continues the evaluation of the history of the West from the Renaissance-Reformation period to the present. It encompasses the underlying political, social, intellectual, cultural and economic elements that have influenced the West. Areas of investigation include exploration and commerce, religion-political post-Reformation wars, age of Baroque, age of reason, revolutionary era, age of Mutterich, European imperialism, World Wars and the Cold War.

Upon successful completion of this course, students should be able to:

- Evaluate the effects of the enlightenment on the evolution of Western culture.
- Explain the impact of the 17th- and 18th-century revolutionary movements on the sociopolitical development of Western Europe.
- Analyze the principal ideologies that were born in 19th-century Europe.
- Describe the effects of the Industrial Revolution on the development of Western culture.
- Detail the development of national states in France, England, Germany and Italy.
- Analyze the causes and effects of the principal 20th-century wars.

3 Credits 3 Weekly Lecture Hours

HIS 200 Civil War and Reconstruction

This course encompasses the critical period of American history from 1850 to 1877. It examines the political, social, diplomatic and economic aspects of the Antebellum, Civil War and Reconstruction periods. It also emphasizes the military and naval activities of the time.

Upon successful completion of the course, students should be able to:

- Describe the major causes of the Civil War.
- Relate the elements of the Compromise of 1850 and their importance to the preservation of the Union.
- Enumerate the events of the 1850s that had an effect on the Civil War.
- Evaluate the actions of Lincoln and the southern authorities in relation to the attack on Fort Sumter.
- Compare the various resources of the North and the South and show why the war lasted four years.
- Compare the governmental systems of the United States and the Confederate States for weaknesses and strengths.
- Detail Union and Confederate strategies for successfully concluding the war for each side.
- Relate the importance of the major military and naval operations of the war and determine the reasons for their successes or failures.
- Describe civilian life during the war in the North and the South.
- Evaluate the contributions of important civilian, military and naval personnel to the war efforts of each side.
- Identify and explain the importance of certain battles, diplomatic endeavors and legislation upon the war and its prologue and aftermath.
- Cite and explain the major issues in the elections of 1852, 1856, 1860, 1864, 1868, 1872 and 1876.
- Relate the events leading up to the Compromise of 1877, the details of the compromise and its effects.
- Explain the significance of the “Reconstruction Amendments.”
- Evaluate the successes and failures of Reconstruction with special emphasis upon their significance in the 20th century.
- Explain the relationship of the Radical Republican Congress to the president and the Supreme Court and show how this Constitutional crisis was resolved.

3 Credits 3 Weekly Lecture Hours

HIS 210 African-American History

This course is an introductory survey course in black history. It exposes students to the roles played by Africans and people of African descent in world history.

Upon successful completion of this course, students should be able to:

- Trace African heritage and culture in both Africa and the United States.
- Evaluate the contributions and influence of African people in the development of Western Culture.
- Describe the experience and contributions of Afro-Americans in the United States.
- Assess the history of the African continent in terms of cultural, political and economic factors from the earliest periods to the present, including Sub-saharan/Islamic Africa, the pre-colonial eras and post-World War II development.

3 Credits 3 Weekly Lecture Hours

HIS 210 Diplomatic History of the United States

This course is a survey of the diplomacy and foreign policy of the United States with particular emphasis upon 20th century American diplomacy with its consequent U.S. involvement on the international scene.

Upon successful completion of this course, students should be able to:

- Explicate the basic provisions of the federal constitution that govern the establishment and administration of American foreign policy.
- Evaluate the views of “conflict,” “consensus” and “new left” historians on the development of American foreign diplomacy.
- Analyze the role of American foreign policy on the declaration of prosecution of major American wars.
- Delinate the major goals of American foreign policy.

3 Credits 3 Weekly Lecture Hours
HIS 220 History of Europe Since 1914  
A study of the history of Europe since the beginning of the Great War. It includes a detailed look at World War I, the post-war decade, the rise of the dictators, World War II and its aftermath and the Cold War.  
Upon successful completion of this course, students should be able to:  
• Analyze the ideas of Marxism as an economic theory and as a philosophy of history.  
• Delineate the causes and effects of World War I.  
• Analyze the causes and effects of the Russian Revolution.  
• Describe the trends in art, literature, and music in early 20th-century Europe.  
• Analyze the rise of totalitarian regimes in Italy and Germany.  
• Delineate the causes and effects of World War II.  
• Evaluate the historic roots of Europe’s current role in the world political.  
3 Credits  3 Weekly Lecture Hours

HIS 225 History of World War II  
This course will study the major causes and effects of World War II. It will also examine the complexity of global warfare and allied cooperation. In addition, the course will examine the operational art and the moral problems of modern war. It will also address the significance of the Holocaust.  
Upon successful completion of the course, students should be able to:  
• Describe the unique features of “Global War.”  
• Depict the major strategies, campaigns and crises of war.  
• Explain the leadership roles of Roosevelt, Churchill, Hitler, Tojo, and Mussolini.  
• Justify your ethical philosophy concerning modern warfare.  
• Depict the changes in the world’s political balance of power.  
• Cite the daily stress in warfare for the individual service personnel.  
3 Credits  3 Weekly Lecture Hours

HIS 241 History of Ireland  
This course examines the early history of Ireland to 1607. It encompasses such topics as pre-Celtic Ireland, the conquest by the Gaels, pagan Ireland and the coming of Christianity, Gaelic life and customs, the Norse invasions, Brian Boru, the Norman invasion and Anglo-Norman Ireland, Tudor Ireland, revolts and English colonization.  
Upon successful completion of this course, students should be able to:  
• Explain the development of early Gaelic culture.  
• Evaluate the impact of Christianity on the Gaels.  
• Analyze the Irish influence on the development of Britain and Europe.  
• Describe life in medieval Ireland.  
• Evaluate the results of the Norman invasions of Ireland.  
• Assess the influence of the Tudors on 16th- and 17th-century Ireland.  
3 Credits  3 Weekly Lecture Hours

HIS 242 History Of Ireland II  
This course examines the history of Ireland from 1607 to the present. It encompasses such topics as the reformation in Ireland, Stuart and Cromwellian Ireland, penal laws, rise of Protestant nationalism, rebellion and union with Britain, Catholic emancipation, famine and rebellions, home rule, Easter Rising, Independence and civil strife, the Free State and Republic, and current problems.  
Upon successful completion of this course, students should be able to:  
• Assess the effects of the Stuarts on 17th-century Irish history.  
• Evaluate the impact of Oliver Cromwell and the Rump Parliament on Irish History.  
• Analyze the Rebellion of 1798.  
• Describe how the union with Great Britain was accomplished.  
• Detail the Irish Nationalistic movement of the 18th and 19th centuries.  
• Evaluate the role of the Catholic Church in Ireland upon Irish Nationalist aspirations.  
• Assess the Rebellions of the 20th century.  
• Analyze and discuss the results of the partition of northeastern Ireland.  
3 Credits  3 Weekly Lecture Hours

HIS 250 Italian Renaissance  
This course covers all aspects of the Italian Renaissance, including politics, science, literature, the arts and cultural institutions. It encompasses such topics as civic humanism and the role it played in stimulating cultural life; the significance of diplomacy; the overall artistic achievements; and why this amazing period of history unfolded in Italy rather than in France, England or Germany.  
Upon successful completion of this course, students should be able to:  
• Discuss how the Renaissance revival of classical learning differed from the previous medieval revival.  
• Define humanism.  
• Assess the achievements and limitations of humanism.  
• Compare the similarities and individuality of the following Italian writers: Dante, Petrarch, Boccaccio and Pico della Mirandola.  
• Discuss the changing role of the Renaissance artist and intellectual from that of medieval craftsmen and artists.  
• Describe Castiglione’s ideal of the perfect courtier from his book The Courtier.  
• Explain the economic advantages that made prosperity boom in Renaissance Italy and its impact on art and culture.  
• Evaluate and describe “civic humanism” and the role it played in stimulating the cultural life of Italy.  
• Discuss the significance of diplomacy in Renaissance Italy.  
• Explain and give examples of what Machiavelli considers “state-craft” to be in his book The Prince.  
• Summarize the factors that worked against the political unification of Italy.  
• Explain why the Renaissance began in Italy rather than France, England or Germany.  
• Describe the main characteristics of the artistic change that took place in 15th-century Italy beginning with Brunelleschi’s Foundling Hospital and Masaccio’s. The Expulsion as the major examples of the shift from Middle Ages to the Renaissance.  
• Evaluate the overall artistic achievement of the Italian Renaissance.  
• Discuss the specific ideas of Vasarius and Galileo.  
3 Credits  3 Weekly Lecture Hours

HIS 251 History of Modern China  
This course is an introductory study of the history of China from the seventeenth century to the present. Specifically, the course seeks to analyze how China has been able to build a dynamic and growing civilization amidst rebellion, reform, and revolution. Political, economic, and social issues will be discussed to gain a greater understanding and appreciation of Chinese civilization. Three major themes in the course will deal with imperialism, nationalism, and modernization. An effort will be made to understand the political, economic, and social “self-strengthening” experiments in China within a global perspective. The final portion of the course will examine contemporary Chinese society.  
Upon successful completion of the course, students should be able to:  
• Explain the importance of the following events in Chinese history: The Taiping Revolution, Opium Wars, Unequal Treaties, Boxer Rebellion, Nationalist Movement, World War I, World War II, Korean War and the Cultural Revolution. Analyze the emerging position of China with regard to its domestic and foreign policy.  
• Gain a greater appreciation of the important role played by China in the modern world.  
• Utilize a variety of source material to examine modern Chinese history.  
3 Credits  3 Weekly Lecture Hours

HIS 252 Women in History - Special Studies  
This is a survey course in Women’s History. It will not only focus on the historical struggles to attain status but will also examine dominant thought within the discipline such as feminism, postmodernism, Womanist and global theories as related to women.  
Upon successful completion of this course, students should be able to:  
• Analyze the evolution of the biological, ideological and political subordination of women.  
• Examine the different facets of social activism to achieve extension of academic and political rights.  
• Investigate the dominant issues relating to women such as health, reproductive rights, employment and violence.  
• Contrast the economic and social status women’s lives in different countries and the role of culture in determining their status.  
• Explore the cultural expressions of women that give definition to their lives.  
3 Credits  3 Weekly Lecture Hours

HIS 253 Modern Latin America: Independence to The Present  
This course will provide an inquiry into the social, political, and economic development of Latin American from Independence to the Present. Students in this course will investigate the historical development of several Latin American nations including: Argentina, Chile, Brazil, Mexico, Cuba, and Nicaragua. These investigations will begin with an examination of the process of independence and conclude with an inquiry into Latin America today.  
Upon successful completion of the course, students should be able to:  
• Examine the geography of Latin America and determine how geography influenced political, economic and social development.  
• Explore the causes for independence and how these factors influenced the development of the Latin America.  
• Investigate the varying reasons for political instability and economic underdevelopment.  
• Investigate the dynamic relationship between Latin America and the United States.  
3 Credits  3 Weekly Lecture Hours

HIS 254 World Civilization I- Special Studies  
An introductory history of the development of the world’s major civilizations to 1500. The course emphasizes the role of economic, social, and political change throughout the ancient and medieval periods of world civilization. Students will gain a greater understanding of the foundations of world civilizations and cultures.  
Upon successful completion of the course, students should be able to:  
• Analyze the development and nature of separate world cultures created over several centuries.  
3 Credits  3 Weekly Lecture Hours
HMT 101 Hazardous Materials Communication

Hazardous Communication is an introductory course in the Hazardous Materials Technician Program. This course explains how to develop and implement a Hazard Communication program for employees, the community, and emergency response personnel. Topics covered include hazard determination, the written program, labeling and placarding, materials safety data sheets and the training program.

Upon successful completion of this course, students should be able to:
- Determine if the materials in the workplace present physical or health hazards to employees.
- Develop or select a labeling and placarding system for hazardous materials.
- Obtain or develop, interpret and disseminate a material safety data sheet for each hazardous material.
- Develop a complete and detailed written program which will satisfy the legal requirements for the federal Hazard Communication Standard.
- Develop, implement and evaluate an effective hazard communication training program which complies with the federal Hazard Communication Standard.

Prereq. CHE 105

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

(HM) Hotel/Restaurant Mgmt.

HRM 100 Introduction to Hospitality

This course introduces students to the vast lodging and food service industry. The origins and history of the modern American hotel/motel business and the enormous growth of the food industries are presented in the context of global tourism. Supervisory duties including organizational theory, resource management of the prime cost associated with these businesses, and asset control processes are introduced. Career opportunities are examined as an essential part of the course.

Upon successful completion of this course, students should be able to:
- Structure task performance in an organization within the lodging/food service industry.
- Apply a basic knowledge of the vastness of the hospitality industry to personal career development.
- Understand the role(s) of various operational functions.
- Use the basic knowledge of record keeping and financial controls common to this industry.
- Increase revenue through marketing.

3 Credits 3 Weekly Lecture Hours

HRM 110 Food Handler Sanitation

This is a 15-hour certification course for food handlers and especially for supervisors. The course is approved by the Pennsylvania Department of Agriculture, Bureau of Food Safety and Laboratory service. Upon successful completion of this course students should be able to:
- Satisfactorily pass the examination administered by the college. Identify the causes of food-borne illness. Handle, store and prepare food in accordance with generally accepted sanitation procedures. Apply federal, state and local regulations/laws specific to food-service procedures.
- Implement a self-inspect sanitation program in a food-service operation.

1 Credit 3 Weekly Lecture Hours

HRM 150 Professional Cooking I

Students are introduced to the modern food preparation techniques used in commercial food operations. Through classroom and culinary lab demonstrations, students learn commercial kitchen organization, the safe/sanitary method of handling minor and major kitchen equipment, menu building, recipe development, preparation of meats, poultry, fruits, vegetables, basic soups/stocks, simple desserts and beverages. Emphasis is on learning by doing. The safe/sanitary handling of food is stressed. Proper uniform is required in the lab.

Upon successful completion of this course, students should be able to:
- Use large and small kitchen equipment including correct and safe knife handling for slicing, dicing, chopping and mincing.
- Develop a standardized recipe.
- Use a recipe, convert to higher/lower yields, use metric measurements and determine recipe costs.
- Build a simple menu and analyze its nutritional content.
- Prepare various foods using poach, bake, fry, deep-fry, roast and saute methods.
- Prepare basic stocks and hot/cold sauces and soups.
- Identify various cuts of beef, pork, lamb and veal and use proper storing practices.
- Identify various types of poultry and their various cooking, handling and storing practices.
- Identify and prepare various vegetables (fresh, frozen, canned and dried) controlling texture, flavor, color changes, nutritional loss and storage.
- Prepare salads and salad dressings as appetizers, main courses and desserts.
- Prepare simple desserts.
- Prepare simple breads and rolls.
- Prepare dairy items and hot beverages.
- Prereq. HRM 100, HRM 110 and MAT 040

3 Credits 3 Weekly Lecture Hours

HRM 151 Professional Cooking II

This course is a continuation of Basic Foods I. The emphasis in this course is on modern food preparation techniques. The course covers commercial food preparation techniques including the preparation of breads, pastry, cakes, hot/cold hors d’oeuvres, pasta, egg, shellfish, and additional meat, poultry, fish and dessert items. Breakfast cooking and sandwich preparation is presented. Proper food presentation and garnishing is stressed.

Upon successful completion of this course, students should be able to:
- Prepare various egg-based recipes.
- Identify and prepare various types of pasta and pasta recipes.
- Prepare various hot/cold hors d’oeuvres.
- Prepare various hot/cold sandwiches.
- Identify and cook various types of shellfish and fish.
- Prepare yeast products including pastries, pies, quick breads, cakes and cookies.
- Prepare various salsas.
- Employ garnishing that makes a meal more attractive to the eye.

Prereq. HRM 150

3 Credits 3 Weekly Lecture Hours

HRM 155 Front Office Management

This course covers in detail the procedures of the hotel/motel front office, including the duties of the manager, desk agent, night auditor, reservations, credit and cash handling. Meaningful statistics and reports are examined. The interdepartmental roles including housekeeping, maintenance, security and other uniformed staff are discussed. The relationship between employees and guest, room design/layout and the future role of computers are presented.

Upon successful completion of this course, students should be able to:
- Develop a hotel organization structure.
- Use basic procedures of a room-reservation system.
- Apply specific knowledge of the lodging industry to careers.
- Register, sell and assign guest rooms.
- Devise room-pricing strategies using various decision-making techniques.
- Communicate interdepartmentally using machines, terminology, symbols and racks.
- Prepare accounts and control cash using manual and machine procedures.
- Use basic procedures of the night audit.
- Prepare and use hotel statistical ratios.
- Apply basic knowledge of the use of computers.

Prereq. HRM 100

3 Credits 3 Weekly Lecture Hours

HRM 162 Laws of Innkeepers

This course is an applied approach to the legal responsibilities of the operational department heads in lodging properties and all areas of food service. Topics include room reservation contract law, torts, AOA requirements, Civil Rights legislation, tip credit reporting requirements, labor law, dram shop, PA Title 18, 47 and 36. All supervisors and department heads benefit from this practical approach to avoiding the legal problems in this industry.

Upon successful completion of this course, students should be able to:
人力资源管理 255 品牌管理

这是一门为那些希望学习如何经营一个酒水饮料店并控制饮料的课程。这不是一个调酒师的课程。课程包括餐饮店酒吧，酒店饮料服务，餐饮店吧台系统和饮料分发商。联邦标准的食品安全法和USCA 27和Pennsylvania Law Title 47以及所有适当的刑事法律将被呈现。在成功完成本课程后，学生应能够做到：

- 做出人员选择在开发和业务决定中与饮料管理。
- 结果饮料生产的工作。
- 购买，接收，存储和发行饮料在特定的饮料商业。
- 显示基本的饮料操作。
- 审查第三方责任作为饮料环境的影响。
- 显示联邦，州和本地监管/法律到饮料商业。

预修：HRM 100

3学分 3周学术时数

人力资源管理 254 数量食物和餐饮

这门课程强调使用标准化的食谱，工作改进技巧，菜单预估/定价在食品服务运营的计划。讨论包括餐饮，开/召开预备的活动计划，销售和营销实践和操作报告/记录保存。学生将学习并服务一个数量食品活动。

在成功完成这门课程后，学生应能够做到：

- 使用薄的理论到实际的管理性能。
- 使用内部操作控制。
- 制定和设计一个菜单。
- 购买，接收，存储和提供食物。
- 设计和布局了操作区域。
- 向顾客提供预备的食物。
- 执行行政任务与人员。
- 促进和推销产品和服务的一个食物服务运营。

预修：HRM 100

3学分 3周学术时数

人类学 100 视觉艺术简介

这门课程被设计用于让学生，通过一个广阔的理解，到自然的，人去怎么样使各种形式的艺术品和到对重要的艺术在我们的日常生活中。学生将学习艺术家和社会中的一位艺术家的职责和如何角色变化历史。

问题如美学，创造力和理解，以及它意味着成为可视觉地文学的艺术家将被展露。一个广泛的介绍到视觉元素和设计原则将帮助学生们形成一些分析和批评在这样的区域，如绘画，摄影，电影，视频，雕塑，艺术，工艺，环境，设计，剧院，音乐和音乐。

在成功完成这门课程后，学生应能够做到：

- 身份的几个主题和目的的艺术。
- 身份的视觉元素和应用它们在分析的两种和三维的媒体。
- 身份的设计在艺术。
- 应用设计和美学在批评和分析的各种艺术。

展示一个理解全面的清单上术语在艺术世界中，并且应用这些术语在一个书面批评。

展示一个被若干的审美和艺术领域的知识。

预修：ENG 100

3学分 3周学术时数

人类学 120 人类学与艺术

学生们将调查一些的创造性的作品在他们的年龄段：浪漫的，现实的，印象主义的，现代的。

在成功完成这门课程后，学生应能够做到：

- 身份的几个主题和目的的艺术。
- 身份的视觉元素和应用它们在分析的两种和三维的媒体。
- 身份的设计在艺术。
- 应用设计和美学在批评和分析的各种艺术。

展示一个理解全面的清单上术语在艺术世界中，并且应用这些术语在一个书面批评。

展示一个被若干的审美和艺术领域的知识。

预修：ENG 050和REA 050

3学分 3周学术时数

人类学 142 美国电影

这门课程被设计用于帮助学生在分析电影的媒体中，帮助他们记住电影到他们的生活方式和语言，以及刺激他们对世界的看法。

课程包括概述电影历史，一个学科的主题的和偏见的纪录片电影和可见形式的诗歌在艺术的生活中。课程包括一个概述电影的历史，一个学科的主题的和偏见的纪录片电影和可见形式的诗歌在艺术的生活中。

在成功完成这门课程后，学生应能够做到：

- 身份的几个主题和目的的艺术。
- 身份的视觉元素和应用它们在分析的两种和三维的媒体。
- 身份的设计在艺术。
- 应用设计和美学在批评和分析的各种艺术。

展示一个理解全面的清单上术语在艺术世界中，并且应用这些术语在一个书面批评。

展示一个被若干的审美和艺术领域的知识。

预修：ENG 100

3学分 3周学术时数

Humanities (HUM)  Humanities 120  Humanities and the Arts II

Students survey some of the creative works of man through the ages: Romantic, Realistic, Impressionistic, Modern.

Upon successful completion of this course, students should be able to:

- Relate cultural patterns to major periods in the arts.
- Explain the major reasons-historic, sociologic, economic, aesthetic-for the emergence of various cultural patterns.
- Trace the flow of cultural patterns from the past into the future.
- Discuss the major aesthetic principles of poetry, prose, painting, music, architecture and sculpture.
- Compare and/or contrast the characteristics of the major periods of the arts.
- Find a richer life experience through a deeper involvement with the arts.

Prereq. ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours

Humanities (HUM)  Humanities 142  American Cinema

This introductory course in film studies surveys American motion pictures as an industry, a form of artistic expression and a powerful cultural and societal influence. Students taking this course as distance learning should be aware of its independent study aspects.

Upon successful completion of this course, students should be able to:

- Apply federal, state and local regulations/laws specific to the operation of beverage outlets.
- Demonstrate the basic practices of mixology.
- Apply merchandising techniques within an overall marketing strategy of a beverage operation.
- Gather and apply internal information for internal control and operational decision making.
- Demonstrate the basic practices of mixology.
- Properly use equipment, tools and terminology specific to beverage operations.
- Purchase, receive, store and issue beverages in accordance with generally accepted procedures.
- Design and lay out the operational areas.
- Analyze the operations of beverage commerce.
- Structure task performance within a beverage operation.
- Purchase, receive, store and issue beverages in accordance with generally accepted procedures.
- Perform administrative tasks with regard to personnel.
- Promote and merchandise products and services of a food-service operation.
- Use internal operational controls.
- Plan and design a menu.
- Purchase, receive, store and issue food.
- Design and lay out the operational areas.
- Deliver prepared foods to consumers.
- Apply organizational theory to the practical performance of management functions.

Prereq. HRM 100

3 Credits 3 Weekly Lecture Hours

Humanities (HUM)  Humanities 110  Humanities and the Arts I

Students survey the creative works of man through the ages: Greek-Roman Classical, Medieval, Renaissance, Baroque. Upon successful completion of this course, students should be able to:

- Apply federal, state and local regulations/laws specific to the operation of beverage outlets.
- Demonstrate the basic practices of mixology.
- Apply merchandising techniques within an overall marketing strategy of a beverage operation.
- Gather and apply internal information for internal control and operational decision making.
- Demonstrate the basic practices of mixology.
- Properly use equipment, tools and terminology specific to beverage operations.
- Purchase, receive, store and issue beverages in accordance with generally accepted procedures.
- Design and lay out the operational areas.
- Deliver prepared foods to consumers.
- Apply organizational theory to the practical performance of management functions.
- Use internal operational controls.
- Plan and design a menu.
- Purchase, receive, store and issue food.
- Design and lay out the operational areas.
- Deliver prepared foods to consumers.
- Perform administrative tasks with regard to personnel.
- Promote and merchandise products and services of a food-service operation.
- Use internal operational controls.
- Plan and design a menu.
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Prereq. HRM 100

3 Credits 3 Weekly Lecture Hours

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Students survey the creative works of man through the ages: Greek-Roman Classical, Medieval, Renaissance, Baroque. Upon successful completion of this course, students should be able to:

- Apply federal, state and local regulations/laws specific to the operation of beverage outlets.
- Demonstrate the basic practices of mixology.
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- Design and lay out the operational areas.
- Deliver prepared foods to consumers.
- Apply organizational theory to the practical performance of management functions.

Prereq. HRM 100

3 Credits 3 Weekly Lecture Hours
Students participate in hands-on learning experiences to enable them to evaluate and analyze various religious traditions and their spiritual impacts. This includes studying the Judeo-Christian traditions to establish a true inter-religious dialogue.

### HUM 161 Eastern Spiritual Traditions

This course surveys major mythologies of the East, such as Indian, Tibetan, Chinese, Japanese, and lesser-known ones such as those of the aboriginal peoples of Australia and New Zealand. The study of the myths will serve as an introduction to the diverse cultures encountered in the mythic implications of Frankenstein, Romeo and Juliet, or the tales of King Arthur. Upon successful completion of this course, students will be able to:

- Explain the relationships that exist among these religions and its various branches, especially Sufism.
- Trace the changes in those earlier myths as they have been influenced by industrialization, technology, and psychology.
- Compare myth-based fiction (such as Frankenstein) with its current impact as seen in film and television.
- Identify various theological ideas, their derivation, and outlook on life in religion, philosophy, art, music, literature, values and outlook on life. Further, the course will clarify the systems of thought underlying some of humankind’s earliest perceptions of life and the universe.

Upon successful completion of this course, students should be able to:

- Identify and paraphrase a variety of Greek, Biblical, Old English and Native American myths.
- Trace the changes in those earlier myths as they have been influenced by industrialization, technology and psychology.
- Compare myth-based fiction (such as Frankenstein) with its current impact as seen in film and television.
- Identify various theological ideas, their derivation, and outlook on life. Further, the course will clarify the systems of thought underlying some of humankind’s earliest perceptions of life and the universe.

Upon successful completion of this course, students should be able to:

- Demonstrate the ability to apply a theological idea to the one’s own life and relationship to the world.
- Identify theological themes found in various elements of current popular culture.
- Evaluate and analyze a film, book, television program, advertisement, or other form of popular culture medium for its theological content or references to theological ideas.
- Describe various theological ideas, their derivation, and outlook on life in religion, philosophy, art, music, literature, values and outlook on life. Further, the course will clarify the systems of thought underlying some of humankind’s earliest perceptions of life and the universe.

Upon successful completion of this course, students should be able to:

- Explain how theology influences culture.
- Identify theological themes found in various elements of current popular culture.
- Evaluate and analyze a film, book, television program, advertisement, or other form of popular culture medium for its theological content or references to theological ideas.
- Describe various theological ideas, their derivation, and outlook on life in religion, philosophy, art, music, literature, values and outlook on life. Further, the course will clarify the systems of thought underlying some of humankind’s earliest perceptions of life and the universe.

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- Describe various theological ideas, their derivation, and outlook on life in religion, philosophy, art, music, literature, values and outlook on life. Further, the course will clarify the systems of thought underlying some of humankind’s earliest perceptions of life and the universe.
HVA 107 Gas Heating

This course is designed to provide the relevant theory and skill to remove and install gas or oil heating systems. The topics of instruction will include but not be limited to the basic system sizing selection of equipment recognizing the burning requirements for a new installation. Steps to follow for the safe removal of existing equipment will be discussed. Restate an understanding of NFPA 54 the NEC codes and the manufacturers installation instructions. Provides knowledge to perform basic electric wiring for the installation of heating equipment and how ductwork is assembled for hot air systems, the piping schematics, and components for hot water systems will also be presented.

Upon completion of this course, students should be able to:
- Perform a startup and check operation of the equipment.
- Understand basic heat loss calculation.
- Restate the two types of warm air systems.
- Recognize an up flow, and counter flow heater.
- Recognize operating and safety controls.
- Identify the function of each operating and safety control.
- Calculate air combustion.
- Calculate gas pipes. Identify NFPA guidelines for venting gas.

3 Credits 3 Weekly Lecture Hours

HVA 110 Hydronic Heating Systems

This course is an introduction to hydronic hot water heating. The course is designed to cover residential and light commercial systems, which involves many different piping disciplines. Also covered are design and building techniques of hot water heating systems.

Upon successful completion of this course, students should be able to:
- Review safety rules.
- Explain the principles of heat transfer.
- Detail boiler design and construction.
- Calculate heat loss/gain.
- Identify various heat distribution systems.
- Cite the different piping designs of hydronic heating systems.
- Cite the sequence of operation of a gas or oil fired hot water boiler.
- Cite the sequence of operation of a hydronic heating system.
- Service and replace hot water boilers.
- Service mechanical controls of a hydronic heating system.
- Identify and install appropriate venting.
- Analyze combustion procedures.

Prereq. HVA 102
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours
HVA 112 Oil Burners and Hydronic Steam Heating

This course is an introduction to oil burners and hydronic steam heating. The course covers the history of oil burners and their technological growth to present day in residential and light commercial appliances. Also discussed are petroleum crude, refining, and distillation into light grade fuel oil. This course also covers techniques in designing and building of steam heating systems.

Upon successful completion of this course, students should be able to:
- Detail the operation of water-source heat-pump systems.
- Discuss the operation of heat-pump components and control.
- Utilize a T-Drill System for pipe installation and/or repair.
- Prepare and install stainless steel pipe and fittings for Wirsboro (PRO-PEX), Victaulic and LOKRING piping systems.
- Determine the correct application size and pressure rating of piping systems.
- Utilize appropriate terminology for the description of piping systems, components, devices and tools and for installation, repair and replacement of piping systems.
- Troubleshoot refrigeration and air conditioning control systems and isolate the faulty components with the system.
- Demonstrate installation and startup of a heat-pump system.

HVA 201 Refrigerant Certification

This course will instruct the students about the harmful effects of chlorofluorocarbons on the ozone, production limitations and phaseout of CFCs and HCFCs, and recycle, reclaim and recover. Procedures will be demonstrated in theory and active practice.

Upon successful completion of this course, students should be able to:
- Detail the chemical properties of CFCs and HCFCs.
- Cite the claims by the scientific community concerning the potential hazards of chlorofluorocarbons and hydrochlorofluorocarbons to the environment.
- Describe the Montreal protocol and the regulations established by the international community concerning refrigerants.
- Explain the U.S. Clean Air Act and the limits and prohibition of CFCs and HCFCs.
- Handle refrigerants in accordance with new procedures.
- Set up record keeping and documentation for refrigerant management programs.
- State the use and operation of recover, recycle and reclaim equipment.
- Service refrigeration and air conditioning without venting refrigerant into the atmosphere.

HVA 113 Hydronic Troubleshooting

This course demonstrates the control functions of residential hydronic heating systems. The course materials address troubleshooting techniques, electrical and mechanical operations, and a review of basic steam and hot water design schemes. Service, safety, combustion analysis and cost-effective repair are included.

Upon successful completion of this course, students should be able to:
- Operate a residential boiler.
- Recognize and list safety hazards and concerns.
- Use tools to determine draft and combustion.
- Identify mechanical devices including pumps.
- Explain fluid dynamics including pumps.
- Install and wire a zone control module.
- Explain principles of steam.
- Identify types of electrical circuits for zoning.
- Detail basic control schemes.
- Explain hydronic circuits.
- Replace electric mechanical components.
- Identify circuits on diagram.
- Use electric meter.
- Recognize system hazards.
- Review plan of action with owner.

HVA 202 Oil/Gas Burner Service

This course includes review of heat transfer products and their use in institutional and commercial equipment. High efficiency heating equipment, principles and operation, sequence of operation and oil and gas burner technology will be addressed.

Upon successful completion of this course, students should be able to: Explain principles of combustion.
- Identify three methods of heat transfer.
- Cite the principles of induction and convection of high-efficiency heating equipment.
- Detail furnace design and construction.
- State the function of safety controls, their purpose and operation.
- Describe potential venting problems with high-efficiency equipment and review the methods to prevent problems from occurring.
- Depict hydronic heating-system components and design. Service oil and gas burners.

HVA 200 Advanced HVACR Electrical Fabrication

This course will introduce the student to the operating and safety controls in refrigeration and air conditioning equipment. Also addressed will be the use and application of schematic and ladder wiring diagrams and introduce the proper troubleshooting procedures of residential and light commercial systems.

Upon successful completion of this course, students should be able to:
- Detail the system operation and sequence of operation for typical refrigeration and air conditioning equipment. Identify common problems with contractors and relays and determine proper replacement procedures when defective components are found. Explain control circuits, their use and potential problems.
(IMM) Interactive Multimedia

IMM 100 Interface Design Using Director
This course introduces students to developing user interfaces using Macromedia Director. Learn the process of designing graphical user interfaces (GUIs) that are easy to use and easy to learn. Topics include human/computer interaction (HCI), metaphors, screen design basics, interfaces for the PC and the Web, and an interface design development process. Students also learn to analyze and evaluate user interface requirements and to design effective and efficient multimedia programs using Macromedia Director.

Upon successful completion of this course, students should be able to:
• Demonstrate the ability to use ImageReady to add rollovers to graphics.
• Demonstrate the ability to use ImageReady to create hotspots, slices and animation.
• Demonstrate the ability to use Fireworks to create hotspots, slices and animation.
• Demonstrate the ability to use ImageReady to create Web documents.
• Demonstrate the use of Fireworks panels.
• Demonstrate the ability to use Fireworks to create hotspots, slices and animation.
• Demonstrate the ability to use Fireworks to add rollovers to graphics.

Prereq. DPR 100 or DPR 108
3 Credits 3 Weekly Lecture Hours

IMM 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

IMM 200 Flash
This course is designed to introduce students to the development of interactive multimedia programs using Macromedia Flash. Flash is the development software to design and develop low-bandwidth animations and presentations. Using this software application, students

should be able to:
• Demonstrate the ability to use Flash to create animations and presentations.
• Demonstrate the ability to use Flash to create interactive multimedia programs.
• Demonstrate the ability to use Flash to create interactive Web documents.
• Demonstrate the ability to use Flash to create interactive multimedia programs.
• Demonstrate the ability to use Flash to create interactive Web documents.
• Demonstrate the ability to use Flash to create interactive multimedia programs.

Prereq. IMM 120 and DPR 108
Prereq. IMM 120, DPR 108
3 Credits 3 Weekly Lecture Hours

IMM 110 Multimedia Graphics & Design
This course provides an introduction to multimedia and the World Wide Web (WWW). Students learn to utilize Adobe Photoshop, ImageReady, and Macromedia Fireworks to create and edit professional-looking graphics for use in multimedia and web applications. Students learn about digital imaging through hands-on use of flat-bed scanners and digital cameras.

Upon successful completion of this course, students should be able to:
• Define multimedia and identify its components.
• Demonstrate a fundamental knowledge of the WWW.
• Identify the latest multimedia/WWW hardware and software requirements.
• Determine how and where multimedia and WWW technologies are used.
• Scan images with a flat-bed scanner.
• Capture photographs using a digital camera.
• Use Adobe Photoshop to retouch images and create graphics for incorporation into a multimedia authoring program.
• Apply the principles of design such as color and layout.
• Demonstrate the capability of Photoshop palettes.
• Demonstrate the use of Photoshop selection and painting tools.
• Demonstrate the use of Photoshop filters, opacity and blending modes.
• Demonstrate the ability to use Photoshop to create multimedia and Web documents.
• Demonstrate the ability to use ImageReady to create hotspots, slices and animation.
• Demonstrate the ability to use ImageReady to add rollovers to graphics.

Prereq. DPR 100 or DPR 108
3 Credits 3 Weekly Lecture Hours

IMM 120 Web Page Development
This course introduces students to publishing on the World Wide Web (WWW) using HTML, XHTML, and Macromedia Dreamweaver. Students will gain hands-on experience in creating Web pages that include text, images, sound, video, animation, and basic JavaScript. Concepts, features, and the history of the WWW are also included. Upon successful completion of this course, the student should be able to:
• Demonstrate the ability to use Fireworks to create hotspots, slices and animation.
• Demonstrate the ability to use Fireworks to add rollovers to graphics.
• Demonstrate the ability to use Fireworks to create Web documents.

Prereq. DPR 100 or DPR 108
3 Credits 3 Weekly Lecture Hours

IMM 122 Programming the Web
In this course Web developers learn to add dynamic content and interactive elements to Web pages using scripting languages with an emphasis on PHP. Learn how to write and embed PHP into HTML. Design a relational database system using MySQL and connect to it using PHP. E-commerce issues such as user authentication, how to securely gather, transmit and store data will also be addressed. Upon successful completion of this course, students should be able to:
• Design scripts using string, numeric, Boolean variable types, expressions and arithmetic operators.
• Write user-defined functions.
• Define and use objects, properties, methods and events.
• Incorporate conditional and repetition structures into scripts.
• Use CSS to add interactivity to WWW pages.
• Describe the use of HTML, XHTML, and XML.
• Use Macromedia Dreamweaver to design and develop WWW pages.

Prereq. DPR 100 or DPR 108
3 Credits 3 Weekly Lecture Hours

IMM 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

IMM 201 Audio & Video for Multimedia
This course provides students with the skills needed to design and develop interactive multimedia materials for stand-alone, network and WWW use. Students learn several of the currently available tools used to produce audio and video for multimedia applications, including Sonic Foundry Sound Forge XP and Ulead Media Studio. This course also includes an introduction to Macromedia Authorware, which is used to develop multimedia projects employing student-selected themes.

Upon successful completion of this course, students should be able to:
• Demonstrate the ability to capture digital audio using a digital camcorder.
• Demonstrate the ability to capture analog audio using a VCR/Camcorder.
• Use CSS to add interactivity to WWW pages.
• Demonstrate the use of Basic HTML Tags to create WWW pages.
• Use CSS to add interactivity to WWW pages.
• Describe the use of the basic tools of Authorware: display icon, motion icon, quiz icon, map icon, digital video icon, sound icon and video icon.

Prereq. DPR 100 or DPR 108
3 Credits 3 Weekly Lecture Hours

IMM 202 Authorware
This course explores the more sophisticated capabilities and tools of Macromedia Authorware including custom buttons, interaction icon, branching options, judging, navigation icon, framework icon, calculation icon, functions and variables, decision icon and packaging. Upon successful completion of this course, students should be able to:
• Organize and thoroughly develop a navigation structure using the interaction, navigate, framework, and calculation icons.
• Create different types of interactions: buttons, hot spot, hot object, target area, pull-down menu, conditional, text entry, keypress, time limit and tries limit.
• Create hyper/hyperlinks by defining and applying styles.
• Create and demonstrate the use of custom and system variables.
• Create and demonstrate the use of system functions.
• Create a catalog file using functions and variables.
• Publish an Authorware piece as an executable file or for the Web.
• Design and develop effective and interactive multimedia.

Prereq. IMM 120
3 Credits 3 Weekly Lecture Hours

IMM 205 Flash
This course is designed to introduce students to the development of interactive multimedia programs using Macromedia Flash. Flash is the development software to design and develop low-bandwidth animations and presentations. Using this software application, students

should be able to:
• Demonstrate the ability to use Flash to create animations and presentations.
• Demonstrate the ability to use Flash to create interactive multimedia programs.
• Demonstrate the ability to use Flash to create interactive Web documents.
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• Demonstrate the ability to use Flash to create interactive multimedia programs.

Prereq. IMM 120, DPR 108
Prereq. IMM 120, DPR 108
3 Credits 3 Weekly Lecture Hours

COURSES DESCRIPTIONS

DELAWARE COUNTY COMMUNITY COLLEGE
Experience.

- Describe and utilize various models to enhance and improve learning outcomes.
- Increase success in achieving educational objectives.

INT 100  Student Success

- Demonstrate the use of multimedia and Web software tools to develop a digital portfolio.
- Identify the target audience of a digital portfolio.
- Identify the need for a digital portfolio.
- Demonstrate the ability to organize, collect and prepare material for a digital portfolio.
- Define copyright laws for multimedia and Web development.
- Demonstrate the ability to design a user interface for a digital portfolio.
- Demonstrate the use of multimedia and Web software tools to develop a digital portfolio.

Prereq. DPR 100 or DPR 108 or Equivalent Computer Experience.

IMM 250  Portfolio Development

The focus of the Digital Portfolio course is to design an electronic portfolio that makes evident a student’s knowledge and skills of multimedia and Web development applications. The portfolio is a collection of material that can be used as an interactive resume, an archive of work over time or a demonstration of proficiency. The contents of a student’s digital portfolio can include work samples, letters of recommendation, references, transcripts, GPA, accomplishments, awards, competency lists, certifications, curricular standards, instructor assessments/evaluation and work experiences/employer evaluations. Thus, a student’s digital portfolio provides the ability to show work on demand and evidence of the preparation for a multimedia and Web development career.

The objective of this course is for students to demonstrate the theoretical as well as the technical skills they have acquired throughout the program. Students will assess personal strengths to establish a career goal and decide how to organize their media design and production work in a graduation portfolio. Upon successful completion of this course, students should be able to:

- Identify the need for a digital portfolio.
- Identify the target audience of a digital portfolio.
- Demonstrate the ability to organize, collect and prepare material for a digital portfolio.
- Define copyright laws for multimedia and Web development.
- Demonstrate the ability to design a user interface for a digital portfolio.
- Demonstrate the use of multimedia and Web software tools to develop a digital portfolio.

Prereq. IMM 100 or IMM 205 and IMM 120

3 Credits 3 Weekly Lecture Hours

IST 101  Industrial Drive Systems

This course is designed to present the theory and practical applications associated with industrial drive systems. Specific instruction will be placed on the demonstration of knowledge and skills required of an Industrial Systems Technician. Students will learn how to analyze, operate, install, troubleshoot and maintain various mechanical systems utilizing belts, chains and drive shafts, and associated components such as bearings, seals, gears, couplings, sprockets, keys and linkages. Heavy emphasis is placed on mechanical drive arrangements where practical solutions are required. Students will also become familiar with drive units and speed control systems.

Upon successful completion of this course, students should be able to:

- Describe the terminology, design, function, and components of both belt and chain driven systems.
- Explain the function of cogged belts, and synchronous belts and their benefits.
- Compare the varied types of drive and speed control systems used in industry.
- Define various types of chain lubrication methods, and demonstrate how to maintain each.
- Compare various types and applications of gera drives and their applications.
- Perform calculations involving ratios, shaft speed, and torque for a gear train drive system.
- Describe the function of chain drive components within various types of chain drive systems, and specify a system for a given application.
- Select the appropriate belts, pulleys, chains and sprockets for a specific system installation.
- Describe the function, operation, safety features, lubrication, and maintenance requirements of a material handling conveyor system.
- Calculate pulley ratios as well as shaft speed and torque associated with a belt drive system and determine belt deflection for a given application.
- Calculate conveyor belt length and linear speed using multi-methods.
- Conduct job planning and perform routines to include lockout and tag out procedures for varied pieces of industrial process control equipment.
- Install and align a conventional v-belt drive system, a multi-belt drive system and describe the methods for measuring belt tension.
- Remove and install a chain sprocket and set chain sag for a given application.
- Demonstrate the installation and alignment of a single, and a multiple chain drive system.
- List various coupling design categories, and demonstrate coupling alignment using rim, face indicator methods.
- Specify, install, operate, troubleshoot and maintain a flat belt conveyor system.

Prereq. REA 030, ENG 025 or pass test

3 Credits 3 Weekly Lecture Hours

COURSE DESCRIPTIONS   123

Delaware Community College
• Start-up and operate a manually controlled processing system, an open loop control system, and a closed loop control system.
• Troubleshoot belt drive, chain, and couplings systems.

Prereq: IST 100 Coreq: TME 115
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

IST 105 Industrial Systems

Drawings Interpretation

This introductory course in blueprint reading prepares students to interpret mechanical, electrical and commercial architectural drawings and plans. Students learn about the different types of graphic representations in the electrical, mechanical and commercial construction trades, as well as how these drawings are related to the job requirements of an Industrial Systems Technician. The course will cover mechanical drawings, orthographic projections, dimensioning, use of symbols, wiring and control diagrams, piping and electrical distribution systems, and commercial construction building site plans. Emphasis will be placed on the understanding, interpretation and application of drawings.

Upon successful completion of this course, students should be able to:
• Define the purpose and use of symbols as well as the terminology associated with industrial system drawings.
• Relate the meaning of line types, dimensions, views and sections, orthographic projection, notes, etc.
• Describe mechanical details, components, and assemblies.
• Interpret electrical schematics, to include single line, full wiring, and electrical ladder diagrams.
• Describe building wiring, conductor color coding, phase color coding and termination schemes.
• Read drawings of piping, electrical, and piping distribution systems as well as AC control circuits.
• Create and utilize HVAC, wiring, and plumbing schematic diagrams.
• Apply schedules, site plans, and construction specifications as part of job planning requirements.
• Analyze records, reports and other documentation.
• Prepare reference documents as per in-the-field installation, repair or replacement requirements.
• Conduct material take-off and basic estimating routines utilizing drawings.

Prereq: ENG 050, REA 050, MAT 040
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

 IST 200 Pumping Systems

This course provides students with basic skills and knowledge associated with the theory of industrial pumping systems, to include various pumps and system terminology, classification, specification, identification, installation, operation, troubleshooting and maintenance. Theoretical and laboratory instruction in this course provides students with a complete introduction to pumping system function, selection, sizes, dynamics and applications. Topics of coverage will emphasize flow, pressure, metering, valves, piping, single and multi-stage pumps, as well as inlet and discharge designs. A heavy emphasis will be placed on installation, routine and preventative maintenance, and troubleshooting of systems.

Upon successful completion of this course, students should be able to:
• Define and describe the function of a pump, and give an application.
• List and define various categories and types of pumps and their applications.
• Utilize appropriate terminology associated with pumps and pumping systems.
• Explain the dynamics of a pumping system.
• Interpret and explain manufacturer’s pump specifications and pump curves.
• Define pump efficiency and explain its significance to overall system operations.
• Describe the function, purpose, and applications of series and parallel pumping systems.
• Specify fluid properties relative to pump selection and operation.
• Describe the installation of a single stage pump, to include sizing specifications and measurements.
• Describe the purpose and proper use of a flow meter.
• Calculate flow velocity and describe the relationship between pressure and head.
• Explain cavitation in a pump system, as well as corrective actions.
• Identify and configure pump motors and drives.
• Determine and select measurement instruments, tools, anchors, shims, fittings, valves, piping, and gasket materials required to install a pumping system.
• Calculate pump efficiency and make proper adjustments (as applicable).
• Describe suction, discharge, and total head and demonstrate the use of pressure and vacuum gages.
• Install a centrifugal pump using manufacturer’s specifications.
• Identify, specify, and replace packing and mechanical seals.
• Start-up, inspect, maintain and troubleshoot a pump.

Prereq: TME 115, MAT 110, PHY 100
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

(ITA) Italian

ITA 101 Elementary Italian I

Introduces the basic principles of pronunciation and grammar essentials of the Italian language. Continuing emphasis on development of listening and speaking skills. Upon successful completion of this course, students should be able to:
• Recognize the essential differences between the Italian and English pronunciation systems.
• Understand in oral and written form first-level content words and grammatical principles.
• Read aloud in Italian with due attention to principles of good pronunciation including word-stress intonation patterns.
• Produce appropriate pattern and sentence transformations.
• Write in dictation form with a reasonable degree of accuracy from materials that have been studied.
• Recall familiar facts of Italian and European civilizations from reading assignments.

3 Credits 3 Weekly Lecture Hours

ITA 102 Elementary Italian II

A continuation of Elementary Italian I with introduction to reading short cultural and practical essays. Weekly laboratory practice extends the basis for understanding the spoken language. Upon successful completion of this course, students should be able to:
• Respond in Italian to a representative number of daily situations according to dialogues illustrated.
• Produce with more accuracy the phonetic sounds of the language and include the correct rhythm, stress and linking components.
• Read familiar prose aloud in a manner acceptable to the fluent speaker.
• Carry out familiar requests made in Italian.
• Demonstrate increased command of vocabulary and elements of grammar.
• Express briefly ideas on a given topic when guidance is offered.
• Recall familiar facts of Italian and European civilizations from reading assignments.

Prereq: ITA 101 or two yrs H.S. Italian
3 Credits 3 Weekly Lecture Hours

(MAT) Mathematics

MAT 040 Basic Mathematics

This course is designed for students who wish to strengthen their arithmetic and basic algebra skills. Topics include whole numbers, fractions and mixed numbers, decimals, ratio and proportion, percent and basic algebra. This course is a prerequisite for Business Mathematics and is useful as a preparation for Developmental Mathematics. This course is offered using either an individualized instruction approach or a classroom lecture approach.

Upon successful completion of this course, students should be able to:
• Write in words or numerals, add, subtract, multiply, divide and round whole numbers.
• Reduce, add, subtract, multiply and divide fractions and mixed numbers.
• Write in words or numerals, add, subtract, multiply, divide and round decimals.
• Convert fractions, decimals and percents.
• Add, subtract, multiply and divide signed numbers.
• Find the missing number in proportions and linear equations.
• Solve word problems involving the competencies above.
• Credits are not applicable to a degree

3 Credits 3 Weekly Lecture Hours

MAT 060 Developmental Mathematics

This course is designed to prepare students for mathematics courses in the college transfer curricula and for Technical Mathematics I. It involves the study of elementary algebra through quadratics. This course is offered using either an individualized instruction approach or a classroom lecture approach.

Upon successful completion of this course, students should be able to:
• Add, subtract, multiply and divide signed numbers, polynomials, rational expressions and radicals;
• Solve first-degree equations and inequalities in one variable.
• Graph a first-degree equation in two variables.
• Solve literal equations for the indicated variables.
• Factor polynomials, and
• Solve rational equations, 2x2 system of equations, and quadratic equations.
• Credits are not applicable to a degree

3 Credits 3 Weekly Lecture Hours

MAT 100 Intermediate Algebra

This course is designed primarily as a preparatory course for students intending to take the College Algebra and Trigonometry I and II sequence. Topics covered in this course include linear equations and inequalities; quadratic equations; introduction to functions and their graphs; 2x2 linear systems; polynomials; rational expressions and equations; and radical expressions and equations.

Upon successful completion of this course, students should be able to:
• Solve linear and absolute value equations and inequalities, and formulas
• Solve problems involving function and their graphs
• Graph linear functions and determine equations of lines
• Solve 2x2 linear systems
• Factor polynomials
• Simplify and perform basic operations on polynomials, rational expressions and radical expressions
• Solve quadratic, rational and radical equations

Prereq: MAT 060
3 Credits 3 Weekly Lecture Hours
MAT 110  Technical Mathematics I
A basic course for the technologies. The course begins with a review of number operations, data handling, geometry and algebraic expressions. Algebraic fractions, linear equations and inequalities, linear functions, graphing and basic trigonometry are included. It is highly recommended that students in this course possess a handheld calculator.
Upon successful completion of this course, students should be able to:
• Perform calculations on experimental data and report results to the appropriate precision.
• Factor certain polynomials and perform arithmetic operations on algebraic fractions.
• Solve linear equations and linear inequalities in one variable.
• Graph linear equations in two variables and interpret their properties.
• Solve triangles using trigonometric ratios and the laws of sines and cosines.
• Solve applied problems involving the competencies above.  
PreReq. MAT 060
4 Credits 4 Weekly Lecture Hours

MAT 111  Technical Mathematics II
A continuation of Technical Mathematics I. Topics include linear systems, radicals and complex numbers, quadratic equations and systems, advanced trigonometry to include vectors and graphing trigonometric functions, logarithms and exponentials.
Upon successful completion of this course, students should be able to:
• Solve a system on linear equations.
• Perform standard operations on radicals and complex numbers.
• Solve and graph quadratic equations and quadratic systems.
• Perform operations on vectors.
• Graph trigonometric functions.
• Evaluate and graph expressions involving logarithms or exponentials.
• Solve applied problems involving the competencies above.  
PreReq. MAT 110
4 Credits 4 Weekly Lecture Hours

MAT 120  Modern College Mathematics I
This course is designed to give students in the non-science fields an appreciation and experience in using the concepts, logical reasoning and problem-solving techniques involved in various fields of mathematics. It fulfills the mathematics elective for liberal arts, administration of justice, early childhood education, fine-science technology and general education majors and may be used to fulfill the mathematics requirement for business administration majors depending upon the institution to which they transfer.
Upon successful completion of this course, students should be able to:
• Use the notation and operations of set theory.
• Use inductive and deductive reasoning as appropriate to draw a logical conclusion from given information.
• Represent numbers and add, subtract, multiply and divide in numeration systems other than base 10. Plus, choose two of the following three competencies: Analyze the real-number system.
• Solve linear equations and inequalities using algebraic and graphical techniques.
• Use ratios, proportions and percent to solve consumer-related problems.
PreReq. MAT 060
3 Credits 3 Weekly Lecture Hours

MAT 121  Modern College Mathematics II
This course is similar to Modern College Mathematics I in design and use as a mathematics elective. It may be taken before Modern College Mathematics I.
Upon successful completion of this course, students should be able to:
• Apply techniques and formulas to solve problems involving permutations and combinations.
• Use the definitions, axioms, and theorems of probability to solve problems.
• Use statistical measures, graphs, and normality to analyze a distribution.
• Plus, one of the following competencies:
  • Analyze various mathematical systems including the integers mod m using the cumulative group properties.
  • Use the concepts and theorems of elementary number theory to solve problems.
  • Solve problems involving the metric system.
  • Use the concepts and formulas of elementary geometry to solve problems.
  • Use the computer to solve problems in the competencies covered.
PreReq. MAT 060
3 Credits 3 Weekly Lecture Hours

MAT 125  Mathematics for Elementary Teachers I
This course emphasizes both the clear understanding of mathematical ideas and, especially, the ability to communicate these ideas to elementary school children. Using various mathematical models this course covers the following topics: sets, whole numbers, numeration, estimation, number theory, fractions, decimals, integers and proportions.
Upon successful completion of this course, students should be able to:
• Utilize the key mathematical processes of communicating, reasoning, solving problems and making connections.
• Demonstrate an understanding of structure, properties and operations in the whole number system.
• Utilize mental computation and estimation techniques.
• Demonstrate an understanding of basic number theory concepts and processes.
• Demonstrate an understanding of structures, properties and operations in the system of integers.
• Demonstrate an understanding of properties and operations with fractions.
• Solve problems using ratios, proportions and percents. 
PreReq. MAT 060
3 Credits 3 Weekly Lecture Hours

MAT 126  Mathematics for Elementary Teachers II
As a continuation of Mathematics for Elementary Teachers I, this course emphasizes both the clear understanding of mathematical ideas and the ability to communicate these ideas to elementary school children. Topics include data analysis, probability, measurement and geometry in two and three dimensions. This course is designed primarily for students planning to major in elementary education but may be elected by other education majors.
Upon successful completion of this course, students should be able to:
• Collect, organize, analyze and interpret statistical data.
• Solve probability problems.
• Use geometric shapes and patterns to describe real world phenomena.
• Demonstrate an understanding of the concept of measurement.
• Use triangle congruence and similarity. 
PreReq. MAT 125
3 Credits 3 Weekly Lecture Hours

MAT 130  Finite Mathematics
This course is designed primarily (but not exclusively) for Business Administration students. Topics include graphing lines and linear inequalities, solving systems of linear equations, matrices, linear programming, set theory, probability, counting principles, and applications from management and economics.
Upon successful completion of this course, students should be able to:
• Analyze the mathematical properties of lines in the plane.
• Perform operations on matrices.
• Solve 2 x 2 and 3 x 3 systems of linear equations.
• Find the optimal solution of a linear programming problem using the graphing method for two variables and the simplex procedure.
• Use the principles of set theory and counting to solve probability problems.
• Apply the mathematical properties of lines and matrices to break-even analyses, economic equilibrium problems, and other business and economic problems.
PreReq. MAT 060
4 Credits 4 Weekly Lecture Hours

MAT 131  Elementary Calculus
This course is designed primarily (but not exclusively) for Business Administration students. Topics include functions, limits, differentiation and integration. Applications include maxima-minima and problems in management and economics.
Upon successful completion of this course, students should be able to:
• Solve algebraic problems prerequisite to calculus.
• Take the derivatives of certain algebraic functions and products, quotients and compositions of such functions.
• Apply the concepts of differential calculus to optimization problems.
• Graph and take the derivatives of exponential and logarithmic functions.
• Integrate exponential, certain algebraic functions and some combinations of these functions using substitution.
PreReq. MAT 130 or MAT 140
4 Credits 4 Weekly Lecture Hours

MAT 140  College Algebra and Trigonometry I
Topics covered in this course are from both College Algebra and Trigonometry and include polynomials, rational expressions, functions (linear, quadratic, trigonometric), and theory of equations. This course is intended primarily for those students who are majoring in science, engineering or mathematics. Together with College Algebra and Trigonometry I and College Algebra and Trigonometry II (MAT 141), it prepares students for Calculus I (MAT 160). Upon successful completion of this course, students should be able to:
• Perform basic operations on real numbers, polynomials, rational expressions and radicals.
• Solve linear, absolute value, radical, and quadratic equations and inequalities and radical equations.
• Perform operations in the rectangular coordinate system.
• Define, evaluate and graph functions.
• Solve problems in plane trigonometry.  
PreReq. MAT 100
3 Credits 3 Weekly Lecture Hours
MAT 141 College Algebra and Trigonometry II
A course that includes topics from College Algebra and Trigonometry dealing with functions (rational, exponential, logarithmic, and circular), theory of equations, and operations on complex numbers. This course is a continuation of College Algebra and Trigonometry I and primarily intended for students in science, engineering, and those preparing for Calculus I. Upon successful completion of this course, students should be able to:

- Perform operations involving functions.
- Solve problems involving polynomials and rational functions.
- Solve verbal and non-verbal problems involving logarithmic, exponential, and circular trigonometric functions.
- Simplify algebraic expressions involving complex numbers.

Prereq. MAT 140
3 Credits 3 Weekly Lecture Hours

MAT 150 Precalculus
This course is designed to prepare students for Calculus I. It includes the study of polynomial, rational, exponential, logarithmic and trigonometric functions, and the complex number system. Emphasis is placed on the graphing of functions.

Upon successful completion of this course, students should be able to:

- Perform the operations necessary to use polynomial, rational, exponential, logarithmic and trigonometric functions in the real-number system.
- Use the polynomial, rational, exponential, logarithmic and trigonometric functions in the solution of equations, inequalities and applied problems.
- Coordinate the geometric properties of points and lines in the Cartesian or polar planes with polynomial, rational exponential, logarithmic and trigonometric functions.
- Use fundamental identities and formulas involving the polynomial, rational, exponential, logarithmic and trigonometric functions.
- Perform algebraic operations on complex numbers.
- Represent complex numbers graphically.
- Consultation with Mathematics advisor is recommended
- Satisfactory MATH placement test score

4 Credits 4 Weekly Lecture Hours

MAT 160 Calculus I
This course is designed for students in the field of science and engineering. It includes the concept of limit, plane analytic geometry, the rate of change of a function, infinite summations, Riemann sums and applications of differentiation and integration. It is a required course for students majoring in Engineering and may be elected by students in Liberal Arts, Business Administration and Science. It serves as a prerequisite for further mathematics courses and the University Physics sequence.

Upon successful completion of this course, students should be able to:

- Use the concept of limit.
- Differentiate functions.
- Use differential calculus to sketch curves and to solve applied problems.
- Integrate functions by approximation and by use of the antiderivative.
- Use integral calculus to determine area and to solve applied problems.

Prereq. MAT 141 or MAT 150
5 Credits 5 Weekly Lecture Hours

MAT 161 Calculus II
This course is a continuation of Calculus I. It includes transcendental functions, methods of integration, improper integrals and the Riemann’s rule, conic sections, parametric equations, polar coordinates, dot and cross products of vectors, and vector calculus in two-and three-dimensional space. It is a required course for students majoring in Engineering, and may be elected by students in Liberal Arts, Business Administration, and Natural Science. It serves as a prerequisite for further mathematics course and for University Physics II (PHY 132).

Upon successful completion of this course, students should be able to:

- Differentiate and integrate using transcendental functions.
- Integrate functions using special methods.
- Relate functional and geometric properties of conic sections, curves given in parametric form, and polar curves.
- Use vectors to solve 2-space and 3-space geometrical problems.
- Use vector-valued functions to describe motion in space.

Prereq. MAT 160
5 Credits 5 Weekly Lecture Hours

MAT 200 Linear Algebra
This course is designed primarily for engineering, computer science and math students planning to transfer to four-year institutions. The topics include systems of linear equations, matrices, determinants, vectors, vector spaces, linear transformations, eigenvalues and applications.

Upon successful completion of this course, students should be able to:

- Perform matrix operations including addition, multiplication and finding the inverse.
- Solve systems of linear equations using matrix methods.
- Find the value of determinants using the methods of cofactors.
- Solve systems of linear equations using determinants and Cramer’s Rule.
- Perform vector arithmetic in two space and three space.
- Determine whether a set with the operations of addition and scalar multiplication forms a vector space.
- Determine a basis for a vector space.
- Use linear transformations to map vectors from one vector space into another.
- Find the eigenvalues of a matrix.
- Apply linear algebra to the solution of problems in mathematics.

Prereq. MAT 161
3 Credits 3 Weekly Lecture Hours

MAT 210 Introduction to Mathematical Statistics
This course is designed to give students a tool as well as a language in which they can better understand and convey the data they work with. It will employ elementary algebra in deriving measures of central tendency and variability for various discrete probability distributions and will include the study of the following topics: descriptive statistics, inferential statistics, frequency distributions, discrete probability distribution (Bernoulli, Binomial, Poisson geometric and hypergeometric) and derivation of their means and variances, Central Limit Theorem, applications of the normal distribution, hypothesis testing, interval and point estimations of population parameters, Chi-square test with contingency tables, linear correlation and regression, analysis of variance, and application of statistics to various disciplines.

Upon successful completion of this course, students should be able to:

- Recognize the role of statistics in critical thinking and the applications of statistics in descriptive and inferential statistics.
- The use of statistical measures of central tendency, statistical measures of variability, statistical measures of position, graphs, stem-and-leaf displays and frequency tables to organize, describe, represent and analyze the data of a population.
- Solve probability problems using the axioms, formulas, definitions and rules associated with a probability.
- Solve probability distribution problems and expected value problems using definitions and formulas.
- Solve problems in statistical inference concerned with sample means distribution, confidence, intervals, minimum sample size determination, hypothesis testing of population parameters (means, variance and proportion), contingency tables independent variables), goodness of fit test (expected distribution) and analysis of variance (equal population means).
- Solving problems involving the model simple linear regression line and the Pearson Product moment linear correlation coefficient.

Prereq. MAT 121 or above
3 Credits 3 Weekly Lecture Hours

MAT 260 Calculus III
This course is a continuation of Calculus II. It includes partial differentiation, multiple integration, vectors and infinite series. It is a required course for students majoring in engineering and may be elected by students in liberal arts, business administration, and science. It serves as a prerequisite for further mathematics courses.

Upon successful completion of this course, students should be able to:

- Find partial derivatives of functions of two or more variables.
- Use partial differentiation to solve applied problems.
- Use techniques of vector analysis.
- Test infinite series for convergence or divergence.

Prereq. MAT 161
3 Credits 3 Weekly Lecture Hours

MAT 261 Differential Equations
This course is designed for students in the fields of science and engineering. It includes first-order differential equations, linear higher-order differential equations, applications, systems of equations, Laplace transformation, series and approximate solutions. It is a required course for students majoring in engineering and may be elected by students in Liberal Arts, Business Administration and Science.

Upon successful completion of this course, students should be able to:

- Solve first-order differential equations.
- Solve linear higher order differential equations.
- Use differential equations to solve applied problems.
- Solve systems of differential equations.
- Use Laplace transformations to solve differential equations.
- Solve differential equations by use of series.
- Find approximate solutions by use of numerical methods.

Prereq. MAT 260
3 Credits 3 Weekly Lecture Hours

MAT 105 Business Math
This course stresses practical applications of arithmetic and mathematical concepts appropriate to the various occupational programs in business.

Upon successful completion of this course, students should be able to:
• Balance a checkbook and reconcile a bank statement.
• Apply the base, rate, portion formula in solving business problems.
• Calculate trade and cash discounts on a bill or invoice.
• Re-price merchandise by markup and markdown formulas.
• Calculate gross and net payroll figures.
• Use the simple and compound interest formulas in banking decisions.
• Read and interpret a simplified balance sheet and income statement.
• Create four types of depreciation schedules.
• Calculate two methods for valuing inventory control.
• Compute local sales and property taxes for an individual.
• Use a monthly payments, annuity and sinking-fund table.
• Calculate the yield in percents on stocks and bonds.
• Calculate reimbursement amount on a fire insurance.
• Convert metric and U. S. measurements.
• Determine three types of “averages” (or determine mean, median and mode).

Upon successful completion of this course, students should be able to:
• Describe Microsoft PowerPoint.
• Use a design template and style checker to create a presentation.
• Enhancing presentations using formatting techniques.
• Use Outline View and Clip Art to create an electronic slide show.
• Import Clip Art from the Microsoft Clip Gallery live Web site.
• Work with masters to display professional and functional presentations.

Upon successful completion of this course, students should be able to:
• Create a database using Design and Database Views.
• Describe databases and database management systems.
• Create a database using Design and Database views.
• Creating and modifying database data.
• Creating and modifying database forms.
• Query a database using the Select Query window.

MCR 125 Microsoft PowerPoint
This is a hands-on course in Microsoft’s presentation graphics software, PowerPoint. Students learn to produce professional-looking presentation materials for overhead transparencies and electronic presentations using a projection device attached to a personal computer. Students also learn to create paper printouts, outlines, speaker notes and audience handouts.

Upon successful completion of this course, students should be able to:
• Describe Microsoft PowerPoint.
• Use a design template and style checker to create a presentation.

MCR 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the "Options for Earning College Credit" section of the catalog.

MCR 222 Advanced Microsoft Word
This hands-on course focuses on the more advanced features of Microsoft Word. In this course, students learn to create reports with a title page and tables, to generate form letters, mailing labels and envelopes, and to create a professional newsletter.

Upon successful completion of this course, students should be able to:
• Create a document that has a title page and tables.
• Create a document that uses clip art and the Draw Table.
• Generate form letters using mail merge.
• Create a data source.
• Generate mailing labels from a data source.
• Generate envelopes from a data source.
• Create a professional newsletter.

MCR 223 Advanced Microsoft Excel
This hands-on course teaches the advanced features of Microsoft Excel.

Upon successful completion of this course, students should be able to:
• Create templates and workbooks using Excel.
• Build a data table to analyze data in a worksheet.
• Create a worksheet database.
• Integrate a Word document through imbedding into an Excel document.

MCR 224 Advanced Microsoft Access
This hands-on course teaches students the advanced features of Microsoft Access. Topics include creating a query and using OLE fields on a form.

Upon successful completion of this course, students should be able to:
• Create a query for a report.
• Create date, memo and OLE fields on a form.
• Create and run a macro.

MPT 100 Introduction to Law Enforcement
This course teaches the police candidate the role of a police officer in the community. It defines police power and authority, the potential impact of its misuse on the community as well as social control. Understanding the function of the police within the context of the United States Constitution will also be addressed.

Upon successful completion of this course, students should be able to:
• Explicate the social control of police behavior.
• Describe and apply principles of police discretionary conduct.
• Analyze and describe the role of personal and professional conduct.
• Describe the place of police in our society.
• Show the relationship of police conduct to an ethical code.
• Detail the difference between civil and criminal behavior.
• Describe the role of public and community relations in police work.
• Delinate the role of law and administration of law in our society.
• Depict penology in Pennsylvania.

MPT 101 Professional Development
This course teaches appropriate skills for the maintenance of mental and physical well-being and appropriate professional standards of conduct. It provides relevant theory and instruction numerous areas such as the elements of physical fitness and its relationship to police work. Moreover, the physical and psychological benefits of physical fitness and the importance of establishing a healthy lifestyle in specific areas of physical training, nutrition and weight control will also be addressed.

Upon successful completion of this course, students should be able to:
• Identify the use of force continuum and explain its levels, constraints and cues.
• Identify circumstances where use of non-deadly force is authorized by law.
• Identify circumstances where use of deadly force is authorized by law.
• Demonstrate techniques used to subdue persons using locks, grips, holds, etc.
• Describe stress-inducing situations that can affect the conduct of individual police officers.
• Depict police leadership traits and techniques.
• Analyze psychological barriers to confrontation by police of their own emotional and psychological problems.
• Describe the effect on an officer’s emotional state when exercising police power and authority.
• Demonstrate physical conditioning by performing push-ups, sit-ups, and a mile and one-half run, weight-lifting and sit-and-reach exercises.
• Analyze the U.S. and Pennsylvania Constitution provisions that provide the legal basis for the exercise of police power.
• Provide the legal basis for the exercise of police power.
• Recognize and cite provisions of Pennsylvania statutes that define criminal conduct.
• Apply rules and statutory provisions for arrest, search warrants, electronic surveillance and bail.  
  3 Credits  3 Weekly Lecture Hours

MPT 103 Law and Procedures II
This course is a continuation of Law and Procedures I which teaches the police officer candidate to recognize and cite Pennsylvania criminal statute, the rules of criminal procedures and applicable Constitutional provisions. Instruction in this course will be on theory and skills associated with the significant steps in the arrest, post-arrest, pretrial, trial and post-trial processes. 

Upon successful completion of this course, students should be able to:
• Recognize and cite provisions of the Mental Health Act, Protection from Abuse Act, Liquor Control Act, and Crime Victims Compensation Act.
• Identify major provisions of the Controlled Substance Act pertinent to their enforcement capacity.
• Identify the major provisions of the cell phone laws.
• Recognize provisions of environmental laws, safety concerns, and jurisdictional issues.
• Identify circumstances when a search incident to arrest is authorized.
• Describe a suppression hearing. Identify ethical considerations in search and seizure.
• Identify consequences of conducting an unlawful search.
• Define the legal requirements to search a person, house, etc.
• Define a lawful frisk.  
  Prereq. MPT 102  
  3 Credits  3 Weekly Lecture Hours

MPT 104 Vehicle Code
This course is designed to provide the student with relevant theory and skills in analyzing the provisions of the Pennsylvania Motor Vehicle Code and decisions of operating under the influence detection. Sources of standards for armed pedestrian behavior and the function of law enforcement within the context of the highway transportation system will be defined. 

Upon successful completion of this course, students should be able to:
• Apply appropriate provisions of the Motor Vehicle Code to specific factual situations.
• Demonstrate procedures for breath, urine and/or chemical tests to determine the presence of alcohol or controlled substances.
• Differentiate applicable provisions of the Pennsylvania Motor Vehicle Code and the Criminal Code.
• Detail the role of PennDOT and traffic safety enforcement.
• Cite provisions of the Motor Vehicle Code for issuing citations and arresting individuals for code violations.  
  2 Credits  1 Weekly Lecture Hour 1 Weekly Laboratory Hour

MPT 105 Motor Vehicle Collision Inspection and Related Issues
This course is designed to develop an understanding of the relationship of the cause and analysis of vehicle collisions. Proper identification and documentation of physical evidence as it relates to collisions upon the highway, as well as collision scene, traffic direction and control will also be addressed. 

Upon successful completion of this course, students should be able to:
• Define reportable and non-reportable, traffic and non-traffic motor vehicle collisions.
• Perform the proper sequence of action at collision scene.  
  3 Credits  3 Weekly Lecture Hours

MPT 106 Patrol Procedures and Operations
This course presents the principles of police patrol procedures and operations as the foundation at any police department. It introduces the student to the mental preparation necessary to effectively perform duties and function as a patrol officer. 

Upon successful completion of this course, students should be able to:
• Apply standard accepted principles of police patrol.
• Detail incident procedures for vehicular accidents and violations as well as apprehension of suspects.
• Specify arrest, impounding, and security procedures applicable to patrol activities.
• Define human relations skills applicable to patrol procedures.
• Delineate Miranda warnings requirements.
• Identify purposes and procedures for safe roadblocks.
• Identify markings and colors common to gangs in Pennsylvania.  
  3 Credits  2 Weekly Lecture Hours 1 Weekly Laboratory Hour

MPT 107 Principles of Criminal Investigation
This course is designed to present basic principles of criminal procedures. It defines the role of a responding officer at the scene of a police event as well as, demonstrates the technical capacity to effectively conduct crime scene management preliminary investigations and other patrol-related investigations. 

Upon successful completion of this course, students should be able to:
• Define a preliminary investigation. Identify the general unreliability of eyewitness identification and steps to make such identifications more reliable.
• Coordinate and apply methods of establishing value of stolen and recovered property.
• Demonstrate proper procedures for conducting the initial investigation of rape, sexual assault, and sex crimes.
• Recognize the most common forms of drugs.
• Define proper surveillance techniques.
• Apply principles of preliminary, crime site and follow-up investigation.
• List applicable rules of evidence.
• Detail applicable procedures to protect crime sites and to preserve evidence.
• Perform principles of interview and interrogation.
• Differentiate criminal investigation from civil investigation.  
  3 Credits  3 Weekly Lecture Hours

MPT 200 Human Relations
This course introduces the basic principles by which students can improve their observation skills and perceptions of human behavior. Other topics addressed are sensitivity issues and how people react to authority. The importance of understanding cultural differences and ethnic intermediation will be addressed. 

Upon successful completion of this course, students should be able to:
• List and describe basic universal aspects of the communication process.
• Identify the impact of role awareness, reference groups and motivation of human behavior.
• Apply proper procedures for conducting initial investigation of bias/hate crimes.
• Process legal requirements regarding emergency detention of a mentally ill person.
• Categorize necessary information to be presented in an oral statement.  
  2 Credits  2 Weekly Lecture Hours

MPT 202 Crisis Management
This course enhances the students ability to make judgments and understand the various elements of Juvenile crime and the juvenile criminal justice system. To enable students to understand how to bring a dispute under control will be defined. This course will also teach behavioral skills necessary for the successful and positive resolution of dispute situations. The ability to identify and learn the necessary skills for conflict management will be thoroughly addressed. 

Upon successful completion of this course, students should be able to:
• Describe and apply Constitutional and other legal requirements for arresting an individual or taking the individual into custody.
• Specify and demonstrate procedures required for arrest of individuals and for searches of those taken into custody.
• Delineate unique problems involved in the detention of mentally ill, emotionally unstable and physically handicapped individuals.
• Describe and apply principles for use of force in arrest and custody situations.
• List procedures for extracting hostages and responding to prisoner escapes.
• Identify proper safety procedures before entering a dispute.
• Identify the scope of and the authority of the Juvenile Court.
• Define juvenile delinquent, child in need of supervision and runaway.
• Define elements of the Domestic Violence Act.  
  2 Credits  2 Weekly Lecture Hours

MPT 204 Firearms
This course is designed to teach police officer candidates the fundamentals of proper use of firearms. The course incorporates application of the tactical and decision-making skills necessary for them to apply this critical skill in actual situations to protect themselves and the public from harm. 

Upon successful completion of this course, students should be able to:
• Apply safety rules when using firearms.
• Illustrate proper procedures for use of pistols, shotguns and holsters.
• Define deadly and non-deadly force applications.
• Identify basic principles of ballistics.  
  3 Credits  2 Weekly Lecture Hours 1 Weekly Laboratory Hour

MPT 205 Operation of Patrol Vehicles
This course is designed to teach the skills necessary for safe operation of police vehicles. Students will be well-versed in the control and handling of an emergency response vehicle. Mastery of the principles of safe driving coupled with refinement in driving skills under adverse and simulated emergency conditions will sharpen the students driving reactions. 

Upon successful completion of this course, students should be able to:
• Operate police vehicles under normal and emergency circumstances.
• Describe and analyze an officers responsibilities for civil and/or criminal penalty in case of police vehicle accident.
• Demonstrate skills for safe driving and pursuit of fleeing individuals or vehicles.
• Detail proper vehicle protection systems.

2 Credits
1 Weekly Lecture Hour
1 Weekly Laboratory Hour

MPT 206 Report
Writing/Case Preparation

This course is designed to teach and demonstrate evaluation techniques for accurately recording an incident report. The course enables students to identify the characteristics essential to a good report as well as check for completeness and accuracy.

Upon successful completion of this course, students should be able to:
• Apply techniques of listening and one-on-one communication.
• Apply rules to prepare police officers as witnesses.
• Demonstrate public communication as a police officer through prepared speeches, testimony, and extemporaneous talks.
• Perform proper procedures of notification to a victims family of death or injury.
• Specify communication techniques for emergency notification.
• Identify characteristics as essential to a good report.
• Define the purpose of the law of evidence.

2 Credits
2 Weekly Lecture Hours

MPT 207 Emergency Response Training

This course trains the police officer candidate to provide immediate emergency care prior to arrival of paramedical aid to the site. It provides the student with the knowledge and skills necessary to work as a first responder in an emergency to help sustain life, reduce pain, and minimize the consequences of injury or sudden illness until additional medical help arrives.

Upon successful completion of this course, students should be able to:
• Describe and apply principles of emergency medical care to crisis situations.
• List emergency medical problems confronted by police officers.
• Detail procedures for obstetrical emergencies.
• Stipulate procedures for care of AIDS patients and protection of officers.

3 Credits
2 Weekly Lecture Hours
1 Weekly Laboratory Hour

MPT 208 Handling Arrested Persons

This course introduces the police officer candidate to emergency case management of disorderly mentally ill, criminal or psychologically distraught individuals. The course also covers officer safety and strategy in preparing and pre-planning in an arrest. In addition, it familiarizes the student with the parts and operational mechanisms and use of handtools and teaches safe and efficient transport of individuals placed in custody.

Upon successful completion of this course, students should be able to:
• Describe various violent and dangerous situations, more particularly those involving domestic disputes, mentally ill individuals, and violent criminals.
• Recognize and describe mental illness.
• Detail suicide and hostage-taking events.
• Analyze and apply principles of response to dangerous, potentially dangerous, or hostile crisis situations.
• Apply proper procedures to conduct field search of arrested persons.
• Identify proper procedure to handcuff suspects or prisoners.

1 Credit
1 Weekly Lecture Hour

(MTT) Machine Tool Technology

MTT 108 Mathematics for Occupational Technologies

This course is designed to provide the student with relevant theory and skills in solving practical, industrially based mathematical problems. Topics of instruction will include, but will not be limited to, calculating arithmetic expressions involving whole numbers, fractions, decimals, ratio, proportion, and percentages. The appropriate use of English/metric conversions, exponents, square roots, basic graph interpretation, and basic algebraic expression (formulas) manipulation will be presented. In addition, the solution of geometric figures will be addressed. An introduction to the use of trigonometry for the solution of right and oblique triangles will also be included.

Upon successful completion of this course, students should be able to:
• Conduct arithmetic operations using whole numbers, fractions, and decimals for the solutions of typical technologically based concepts, processes and operations.
• Perform English and Metric computations involving numeric and literal problems.
• Demonstrate the use of a Cartesian and a polar coordinate system to interpret and construct basic graphs, such as, bar, pie, broken line, etc.
• Analyze data and select an appropriate method to construct a chart, or graph, as well as decipher relationships among topical data.
• Solve fundamental expressions and common formulas using algebraic rules for addition, subtraction, multiplication, division, ratio, proportion, percentages, powers and roots, and transposition of terms, to include mixed operators.
• Apply appropriate terminology and rules for solving problems involving basic geometric entities and figures.
• Communicate the rules of similarity and congruency and solve basic triangles.
• Identify and construct right triangles and utilize the Pythagorean theorem, sine, cosine, and tangent functions and The Law of Sines/Cosines for the trigonometric solution of unknowns.

3 Credits
3 Weekly Lecture Hours
1 Weekly Laboratory Hour

MTT 110 Prints Layout and Measurement for Machining

This introductory course is designed to provide instruction in the theory and skills necessary to read conventional drawings commonly used in the machining industry. Instruction will be centered around object visualization and feature definition/recognition. Basic through intermediate difficulty multiview third angle (with lesser emphasis on first angle) projection, to include orthographic, isometric, sectional and auxiliary view drawings will be addressed. Piece-part feature terminology, tolerances, limits, fits, conventional dimensional practices, surface finish and inspection issues will be stressed. Sketching, precision layout tools, measurement tools, and techniques of usage will be covered and utilized to demonstrate comprehension in print/part interpretation.

Upon successful completion of this course, students should be able to:
• Discuss the purpose, the importance, the types, and various uses of engineering drawings, as they relate to the design and manufacture of parts.
• Communicate the purpose of a title sheet, and relate the value of each of its components to the process of completing a finished product.
• Analyze the features of an object and develop representative sketch using the principles of orthographic projection.
• Interpret line work, dimensions, orthographic views, various section types, auxiliary views, and annotations associated with mechanical drawings.
• Visualize objects, describe geometric relationships, determine feature size and placement, and apply terminology in the interpretation of graphical representations of a tab, bevel, chamfer, neck, fillet, round, slot, keyway, flat, boss, pad, hole/pattern, countersink, counterbore, tapered surface, as well as English and metric thread forms and measurements.
• Describe, discuss and apply the techniques used in standard coordinate dimensioning methods to complete sketches, to layout parts, and perform inspection operations.
• Identify, and discuss the purpose, and the limitations, of various layout tools; and, of common precision measuring instruments.
• Demonstrate the use of various layout and precision measurement tools.

4 Credits
3 Weekly Lecture Hours
1 Weekly Laboratory Hour

MTT 111 Introduction to Manufacturing

This course provides an introduction to the field of manufacturing/machining. The course is designed to provide instruction in the commonalities of theory and skills associated with various branches of the manufacturing industry. An overview of departments, engineering design, job planning, process documents, manufacturing support team responsibilities, as well as product workforce member’s duties and responsibilities will be discussed. Shop floor etiquette, workplace cleanliness, safety and health, common powered and non-powered hand tools will be covered. Machine tool operations including cut-off and contour metal cutting, sawing, drilling machines, offhand grinding of High-Speed Steel (HSS) twist drills and lathe tools as well as surface grinding operations will be addressed. The application of measuring and layout tools will be combined with piece-part layout and inspection practices for part production. Materials, including cutting tools, and their properties will be introduced. Non-traditional machining processes, special purpose production machines, as well as hard and soft automation are among additional topics to be discussed. A rudimental introduction to familiarization with conventional lathes and milling machines will also be included.

Upon successful completion of this course, students should be able to:
• Describe the purpose, importance, and responsibilities of various personnel and departments within a manufacturing organization.
• Determine the general salary ranges and job description for a position of employment.
• Outline a plan for personal career path growth in manufacturing.
• Interpret work-related documents such as work orders, process, and various operation sheets.
• Apply appropriate terminology in order to, select, handle, care for, and store tools used to perform bench work, inspection and assembly operations.
• Discuss and apply basic accident prevention practices and procedures, commonly required in manufacturing, as well as personal safety equipment; in order to assure personal health and safety.
• Compare and contrast hardness and machinability ratings.
• Demonstrate procedures for set-up and operation of various sawing, drilling, offhand, and surface grinding machines.
• Perform commonly assigned operator clean up and maintenance tasks associated with grinding, sawing, and drilling machines.
• Demonstrate appropriate shop floor etiquette among co-workers and discuss the basic concepts of customer relationships in the context of work teams facilitation.
M TT 112  Lathe Operations I
This course provides instruction in the terminology, design, setup, operation, and daily care of conventional metal working engine and related lathes. Theory and practical skill development exercises will focus on cutting tool preparations for completing external surface machining such as: straight turning, threading, chucking and tailstock operations. Accident prevention practices and procedures will be stressed throughout the course.

Upon successful completion of this course, students should be able to:
- Lubricate, clean, and perform commonly assigned operator maintenance duties for a lathe.
- Interpret work-related documents for piece-part machining on a lathe.
- Utilize appropriate terminology and accident prevention practices and procedures while referring to, and using lathes, and related accessories.
- Research design criteria and sharpen lathe tools and twist drills via off-hand grinding.
- Utilize detail drawings, calculations, layout tools, precision measuring instruments and appropriate techniques to prepare parts for manufacture on a lathe and verify part dimensions during inspection procedures.
- Identify, select, mount, set-up and adjust appropriate machine tool accessories, attachments, work holding devices, and work-pieces in preparation for performing lathe operations.
- Calculate and set speeds/feeds in order to perform lathe operations such as facing, chamfering, center drilling, drilling, reaming, turning, necking, grooving, parting, knurling, external threading as well as hand tapping, filing, polishing, and de-burring.

Coreq MTT 111
3 Credits
2 Weekly Lecture Hours
2 Weekly Laboratory Hours

M TT 122  Lathe Operations II
This course is designed to provide supplemental theory and skills instruction in conventional lathe machining operations. Skill embellishment and expanded external, as well as internal surface piece-part machining operations and associated accident prevention practices and procedures will be stressed in this course. Concepts and mathematical calculations for part geometry determination, specific lathe (machining) requirements, and the use of digital readout units will be covered. Carbide/ceramic/diamond cutting tool material, insert, and tool holder identification and selection requirements for lathe work shops is covered in detail. Process planning and Geometric Dimensioning and Tolerancing (GD&T) characteristics appropriate for lathe machining will also be addressed.

Upon successful completion of this course, students should be able to:
- Set-up and operate a conventional engine lathe to complete intermediate to advanced operations involving trepanning, tool post grinding, radius-turning devices, threading (tap/die) heads, steady, and follower rests.
- Select accessories and attachments, set-up and use face plates, independent, universal, and combination chucks, collect attachments, and a steady rest to facilitate internal surface feature creation such as radii, bores (straight, and tapered), grooves, and chased threads on a lathe.
- Interpret print requirements (including GD&T) and part geometry for machining and inspection of advanced lathe parts.
- Identify coolant requirements; and, using machinability and other factors, select inserts and toolholders for job completion.
- Perform geometric/algebraic/trigonometric calculations for set-up, machining and inspection of parts, to include chamfers, tapers, threads, etc.
- Review reference materials in order to develop a process plan (to include job/operations tooling, and inspection procedures) for machining of a basic lathe piece-part.
- Conduct mathematical calculations associated with tooling, tooling, torque, horsepower, unit cycle time/cycle time reduction, and basic estimating.

Coreq MTT 112
3 Credits
2 Weekly Lecture Hours
2 Weekly Laboratory Hours

M TT 124  Milling Operations I
This course provides introductory instruction in the terminology, design, application, set-up, operation and daily care of conventional milling machines. Accident prevention practices will be stressed.

Upon successful completion of this course, students should be able to:
- Lubricate, clean and perform commonly assigned cleanup and operator maintenance duties for a milling machine.
- Interpret work-related documents for piece-part machining on a milling machine.
- Utilize appropriate terminology when referring to milling machines, attachments and associated equipment.
- Utilize detail drawings, calculations, layout tools, precision-measuring instruments and appropriate techniques to prepare parts for milling operations.
- Identify required work and tool holding devices, select, mount, set-up and adjust appropriate accessories, attachments, and work-pieces in preparation for performing milling machine operations such as facing, slotting, and slot milling, chamfering, spot drilling, drilling, reaming, spot finishing as well as hand tapping.
- Perform machine head/table and workholding device alignments.
- Calculate and set speeds and feeds, and perform milling machine operations.

Coreq MTT 111
3 Credits
2 Weekly Lecture Hours
2 Weekly Laboratory Hours

M TT 129  Solids (CAM) Modeling
This course is designed to provide introductory instruction in the theory and skills associated with Computer Aided Manufacturing (CAM) solids modeling industry. 3D design / modeling characteristics as well as criteria for constraint and feature-based design modeling will be stressed. Specific elements of designing for Computer Aided Manufacturing (CAM) facilitation will be addressed.

Upon successful completion of this course, students should be able to:
- Determine occupational positions and define basic terms relevant to functioning within the engineering design/manufacturing CAM industries.
- Analyze piece-parts for parametric feature/profile/surface and pattern definition.
- Describe work and tool planes, axes, coordinate systems, and develop feature definitions for manufactured parts.
- Interact with hardware/software in order to create and manipulate various views as a means for appropriately displaying a model.
- Plan and demonstrate steps for creating and modifying (manufactured) part models using a CAM package.
- Develop intermediate to advanced geometric part features and surface models using extrude, revolve, swept, and lofted function solid modeling techniques.
- Manipulate part definition history, and edit shapes via cut and paste functions, as well as Object Linking and Embedding (OLE) functions of the solid modeling software.
- Create/customize and present working (or shopfloor) documents.
- Analyze factors, design and create/customize, and communicate information regarding templates for manufactured part production.
- Perform extraction, as well as import and export operations involving graphical data.

Prereq MTT 112 and Coraq MTT 214
3 Credits
2 Weekly Lecture Hours
2 Weekly Laboratory Hours
MTT 213 Manufacturing Processes

This course is designed to provide broad spectrum, first exposure, technical instruction in the fundamental processes (other than material removal) used to produce manufactured goods. Various aspects of manufacturers’ responsibilities in providing producer and consumer goods, as well as services, will be covered. Generalized methods of conversion of materials into various forms and shapes via processes such as casting, extrusion, injection molding, welding, etc., will be the primary focus of this course. Principles, terminology, as well as practical applications will be stressed. In addition to rounding-out educational experiences for manufacturing/mechanical/drafting and design students, this course is also suited for providing novice engineers, supervisors, and managers with practical experiences in varied manufacturing processes.

Upon successful completion of this course, students should be able to:

- Describe the design process and various considerations engineers typically ponder/explore before deciding on a process for fabrication of an article.
- Discuss the production of parts with respect to the fundamentals of the casting and molding processes.
- Demonstrate a basic understanding of the principles involved in the forming, rolling, drawing, extrusion and molding processes.
- Differentiate, document, and demonstrate flame/arc cutting and welding processes variables.
- Compare and contrast various bonding, joining (to include welding and related processes), and mechanical fastening methods.
- Research, and describe in an oral presentation, a non-traditional material removal process, or prototyping process available to manufacturers, relating same to aspects of future human development.
- Distinguish between the common surface treatments and finishing processes.
- Relate the classifications of production systems and the impact automation has for each.

- Elaborate on the principles of Lean Production and the “Factory within a Department” concepts, suggesting their possible impact on the social fabric of the workplace.
- Summarize the concepts and criteria for reducing costs and increasing productivity on the shop floor.
- Utilize welding, melting, casting, and molding equipment to conduct laboratory exercises.

- Present examples of how artists can use manufacturing processes to create works of art.

Prereq. MTT 108, MTT 110

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

MTT 214 Milling Operations II

This course is designed to provide theory and skill instruction supplemental to that introduced in Milling Operations I (MTT 124). Skill embellishment and expanded surface feature creation in the use of conventional metal working milling machines and attachments, along with associated accident prevention practices and procedures will be stressed. Concepts and mathematical calculations for machining of prismatic (cubicle-like) features and part geometry will be emphasized. Process planning, documentation and Geometric Dimensioning and Tolerancing (GD&T) characteristics for milling work will be addressed. Cutters and insert (geometry and grade) selection, as well as cutting parameters, will be stressed.

Upon successful completion of this course, students should be able to:

- Utilize detail drawings, layout, and inspection tools to produce parts via horizontal and vertical milling operations.
- Plan sequential operations and develop a process, a tooling, and an operation sheet, for advanced piece-part manufacturing on milling machines.
- Develop set-up and inspection procedures for milled parts.
- Compare milling machine cutting tool material types, and their selection criteria.
- Research machinability factors and ratings for various types and classifications of materials.
- Refer to manufacturer’s catalogs and apply theory of cutting tools to determine the application, and the identification of cutting tool adapters, cutters, and inserts.
- Determine coolant selection, speed, and feed settings in regard to tool material and insert geometry requirements in order to obtain specific surface finish requirements on milled parts.
- Interpret print requirements (including CDBT) and part geometry for machining and inspection of advanced milling parts.
- Create internal features to include chamfers, bores, recesses, counterbores, counter sinks, grooves and pockets using a milling machine.
- Set-up and use various style cutters to create form (profile) geometry such as angle, convex, concave, radius, T-slot, and key-way features.
- Mount and use milling machine accessories and attachments such as a right angle plate, rotary table, dividing head, boring head, angular vise, angle plate, V-blocks, sine bar/plate/vise.
- Position fixtures and perform fly cutting, slitting, straddle, and gang milling operations.

Prereq. MTT 124

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

MTT 219 CAM Solids I

As a continuation of the principles of Computer Aided Manufacturing (CAM) design database development and usage, this course is designed to build on the course entitled Solids (CAM) Modeling (MTT 129). At such, instruction in this course will be centered around the theory and skills associated with the generation of 2 through 2 1/2 axis Computerized Numerically Controlled (CNC) machine tool code generation. Specific tool assignment and tool path generation for CNC milling and profiling (router, water-jet, laser and like machines) as well as conventional, two axis, CNC lathes will be addressed.

Upon successful completion of this course, students should be able to:

- Conduct import and export, as well as other data file management and Distributed Networked Computer (DNC) operations.
- Analyze geometry in order to develop tool path routines utilizing appropriate lead in/out and roughing moves to create desired features and surface quality.
- Design and create libraries of commonly used machining operations, as well as modify operations to optimize tool paths for the improvement of part production efficiency.
- Prepare piece-part modeling documentation, to include dimensioning, and, hard copy output.
- Create tool paths for drilling, boring, and reaming on CNC mills and 2-axis lathes.
- Develop, verify, and edit tool path, and CNC code, for single surface profile creation; as well as pocketing, island, and thin-wall surface and feature creation.
- Generate roughing and finishing tool path for drilling, turning, grooving, facing, and threading (to include multiple lead operations (inside and outside) on cylindrical parts.

Prereq. MTT 129 Coreq. MTT 210

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

MTT 220 CNC Programming

This course is designed to provide the experienced Computerized Numerically Controlled (CNC) machine tool operator with instruction in manual part programming and advanced operations. Mathematical applications for definition of location, set-up, positioning and tool movement (absolute/incremental) within specific coordinate systems will be presented. Various aspects of Intermediate to Advanced G and M code programming to include fixture offsets, thread milling, looping, macro, and sub program development/utilization/execution will be included. Criteria relevant to accident prevention practices and procedures, process planning, work-holding, tooling, machine set-up and operation, program proof-out, and quality control will also be addressed.

Upon successful completion of this course, students should be able to:

- Via manual methods, interpret and convert basic piece-part drawings in order to produce proceduralized manufacturing process/operation, workholding, tooling documentation sheets, and job plans for a CNC mill (router on similar machine tool) and a CNC lathe.
- Apply principles of mathematics, engineering print interpretation and geometric analysis to describe part datum’s, surfaces, and feature locations in terms of 2 and 2 1/2, axis machine/tool positioning.
- Prepare and proof a written manuscript for the production of parts on a CNC mill, (or similar machine), and a CNC lathe.
- Utilize mathematical calculations, and concepts of geometric relationships combined with techniques, hardware, software menus and computer system practices associated with a Computer Aided Machining/Distributed Numerical Control (CAM/DNC) system to manually write, save, retrieve and transfer CNC machine tool programs.
- Apply programming techniques (to include advanced canned cycle, loops, and macros).
- Develop programs involving advanced operations such as helical interpolation and thread milling operations.
- Program multiple and varied parts involving multiple operations per set-up to include the use of indexing devices.
- Describe the purpose and use of charting as it applies to Statistical Process Quality Control (SPQC) in the CNC machining environment.
- Discuss the principles and applications of parametric programming as they apply group technology part programming.

Prereq. MTT 210

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

MTT 229 CAM Solids II

This course in advanced principles of Computer Aided Manufacturing/Machining builds on the skills and knowledge gained in CAM Solids I. Topics of instruction will include advanced (multisurface) part modeling and tool path generation for 3-axis milling (similar profiling) machines with additional positioning axis: and multi axis (mill-turn) lathes.

Upon successful completion of this course, students should be able to:

- Analyze 3D-parts geometry in order to conceptualize and create tool paths for prismatic (cube-like) part contours and blended multi-surface generation via 3-axis milling.
- Select an appropriate Computerized Numerically Controlled (CNC) machine tool for required piece-part production.
- Structure a plan for approaching multi-part, same set-up, tool path generation for difficult to machine piece-parts.
- Formulate a strategy, and generate axis positioning, as well as tool path code for 4th and 5th axis programming.
MUS 110  Music for Children

Music for Children offers all students an opportunity to explore and experiment with music rudiments, psychology, philosophy, performance, and pedagogy. This is a course for students who wish to share their own music experiences with others.

Upon successful completion of this course, students should be able to:
- Recognize the role music plays in our culture and in the child’s educational development.
- Identify and relate educational significance to various music activities.
- Apply music rudiments to facilitate educational music activities.
• Perform complex rhythmic patterns with symmetric and asymmetric accents.
• Sight read music applicable to individual skills.
• Play solo and duo piano works, including some standard repertoire of Bach, Mozart and others.
• Perform in an in-class recital.
Prereq. MUS 125 or equiv.

3 Credits 3 Weekly Lecture Hours

MUS 127 Survey of American Musical
In this humanities elective, students study the evolution of musical theater through opera, operetta, minstrel shows and follies to the present. Emphasis is on the interrelationship of both theater and music techniques and styles.

Upon successful completion of this course, students should be able to:
• Discriminate among several specific phases of musical drama.
• Identify the differences between opera and American musicals.
• Describe the contributions of at least 10 noted composers and 10 librettists.
• Compare the evolutionary stages and roles of the various phases of music drama with the culture, society, economics and politics of each period.
• Acknowledge the contributions of noted performers of American musical theater.
• Interrelate all past considerations in the evolution of the musical as they relate to current and future trends in the genre.
Prereq. ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours

MUS 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

(NET) Network Engineering

NET 110 Network Technologies
This course prepares students to have an overall view of the way computers communicate and the basics of networking. Key topics include networking standards, the OSI model, network protocols, transmission media, topologies, hardware, software, WANS and remote connectivity, security, managing and upgrading a network, and TCP/IP. Upon successful completion of this course, the student should be able to:
• Describe the various network services and standards.
• Explain the industry standard OSI model of network computing.
• Describe and establish network security and various management issues.
• Describe connectivity and transmission media.
• Define the topologies and how they work with each other.
• Perform basic TCP/IP computations.
• Describe network protocols and how the work together.
Prereq. ENG 050, REA 050, MAT 040

3 Credits 3 Weekly Lecture Hours

NET 115 Windows XP Professional
In this course students will learn how to set up and support Windows XP operating system. Students will gain experience in installing, administering, and troubleshooting this desktop environment.

Upon successful completion of this course, the student should be able to:
• Install Windows XP Professional.
• Administer access to shared files, folders, and printers.
• Configure and manage hardware devices, drivers, network adapters, and related hardware.
• Troubleshoot Windows XP desktop environment including user profiles, desktop settings, and other services.
• Implement TCP/IP network protocol.
• Explain data and system security through Group Policy, Encryption of Files system, local shares and accounts.
Prereq. NET 110

4 Credits 3 Weekly Lecture Hours

NET 116 Microsoft Windows 2003 Server
In this course students will learn how to set up and support the Windows Server 2003 operating system. Students will gain experience in installing, administering, and troubleshooting this enterprise level server operating system. Upon successful completion of this course, students should be able to:
• Install Windows Server 2003 using various deployment methods.
• Manage and maintain the Windows Server 2003 environment.
• Administer server hardware and disks.
• Perform user, computer, and group account administration.
• Manage and maintain access to resources.
• Implement disaster recovery.
Prereq. NET 115

4 Credits 3 Weekly Lecture Hours

NET 117 Windows 2003 Directory Services Implementation and Administration
Students will learn to install, configure, and troubleshoot MS 2003 Active Directory components, DNS for Active Directory, and Active Directory security solutions. Students will also learn how to manage, monitor, and optimize the desktop environment using Group Policy.

Upon successful completion of this course, the student should be able to:
• Install, configure, and troubleshoot MS Active Directory.
• Install, configure, manage, monitor, and troubleshoot DNS for Active Directory.
• Install, configure, manage, monitor, and troubleshoot MS Windows 2003 network infrastructure
• Configure, manage, monitor, and troubleshoot Active Directory Security.
Prereq. NET 116

4 Credits 3 Weekly Lecture Hours

NET 120 Windows 2003 Infrastructure Implementation and Administration
This course teaches students how to install, manage, monitor, configure, and troubleshoot DNS, DHCP, Remote Access, Network Protocols, IP Routing, and WINS in a MS Windows 2003 network infrastructure. Students will also learn how to manage, monitor, and troubleshoot Network Address Translation and Certificate Services.

Upon successful completion of this course, the student should be able to:
• Install, configure, manage, monitor, and troubleshoot DNS in a MS Windows Server 2003 network infrastructure.
• Install, configure, manage, monitor, and troubleshoot DHCP in a MS Windows Server 2003 network infrastructure.
• Configure, manage, monitor, and troubleshoot Remote Access in a MS Windows Server 2003 network infrastructure.
Prereq. NET 110

4 Credits 3 Weekly Lecture Hours

NET 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

NET 210 CISCO Network Support
In this course, students will learn how to select, configure, and troubleshoot Cisco networking devices. The course will also provide the student with fundamental knowledge of computer networking topics including Internetworking essentials, the OSI Model, and various networking protocols including TCP/IP.

Upon successful completion of this course, students should be able to:
• Explain the OSI Model and the concept of Layered Communications.
• Explore the fundamentals of Bridging and Switching.
• Learn the origin and functionality of the TCP/IP protocol stack and the Novell IPX/SPX protocol stack.
• Describe Cisco Network Basics and the Cisco IOS.
• Identify features and characteristics of various WAN protocols.
• Configure Cisco Routers and Switches.
Prereq. NET 110

6 Credits

NET 230 Novel Network Administration
This course prepares the student to manage a NetWare 6.x network through hands-on experience, worksheets, and theoretical problems. The course teaches basic management tasks for new network administrators. Key topics include network file systems management, NetWare resources, login and file system security, login scripts, server installation, and user connectivity. Novell eDirectory Services (NDS) management, Internet infrastructure, and messaging services are also discussed. Upon successful completion of this course, the student should be able to:
• Develop a network management strategy based on the tools provided with NetWare 6.x.
• Implement a logical, organized, and secure file system.
• Describe and establish login security
• Describe the purpose of a login script and user connectivity.
• Define console commands and NetWare Loadable Modules (NLMs).
• Perform a NetWare 6 server install.
• Describe messaging and the Internet Infrastructure.
Prereq. NET 110

4 Credits 3 Weekly Lecture Hours

NET 235 Advanced Network Support
This course prepares the student to manage a NetWare 6.x network through hands-on experience, worksheets, and theoretical problems. The course teaches basic management tasks for new network administrators. Key topics include network file systems management, NetWare resources, login and file system security, login scripts, server installation, and user connectivity. Novell eDirectory Services (NDS) management, Internet infrastructure, and messaging services are also discussed. Upon successful completion of this course, the student should be able to:
• Develop a network management strategy based on the tools provided with NetWare 6.x.
• Implement a logical, organized, and secure file system.
• Describe and establish login security
• Describe the purpose of a login script and user connectivity.
• Define console commands and NetWare Loadable Modules (NLMs).
• Perform a NetWare 6 server install.
• Describe messaging and the Internet Infrastructure.
Prereq. NET 110

4 Credits 3 Weekly Lecture Hours

NET 236 Network Maintenance
This course prepares the student to manage a NetWare 6.x network through hands-on experience, worksheets, and theoretical problems. The course teaches basic management tasks for new network administrators. Key topics include network file systems management, NetWare resources, login and file system security, login scripts, server installation, and user connectivity. Novell eDirectory Services (NDS) management, Internet infrastructure, and messaging services are also discussed. Upon successful completion of this course, the student should be able to:
• Develop a network management strategy based on the tools provided with NetWare 6.x.
• Implement a logical, organized, and secure file system.
• Describe and establish login security
• Describe the purpose of a login script and user connectivity.
• Define console commands and NetWare Loadable Modules (NLMs).
• Perform a NetWare 6 server install.
• Describe messaging and the Internet Infrastructure.
Prereq. NET 110

4 Credits 3 Weekly Lecture Hours

NET 237 Advanced Network Support
This course prepares the student to manage a NetWare 6.x network through hands-on experience, worksheets, and theoretical problems. The course teaches basic management tasks for new network administrators. Key topics include network file systems management, NetWare resources, login and file system security, login scripts, server installation, and user connectivity. Novell eDirectory Services (NDS) management, Internet infrastructure, and messaging services are also discussed. Upon successful completion of this course, the student should be able to:
• Develop a network management strategy based on the tools provided with NetWare 6.x.
• Implement a logical, organized, and secure file system.
• Describe and establish login security
• Describe the purpose of a login script and user connectivity.
• Define console commands and NetWare Loadable Modules (NLMs).
• Perform a NetWare 6 server install.
• Describe messaging and the Internet Infrastructure.
Prereq. NET 110

4 Credits 3 Weekly Lecture Hours
NET 231 Advanced Novelle Network Administration (6x)
This course enhances the student’s network management and monitoring skills through demonstrations, discussions, and hands-on activities in NetWare 6.x. The course concentrates on installation and upgrade/migration of servers, server and client management, eDirectory, IP and Internet Infrastructure, optimization of server components, security and troubleshooting fundamentals. Upon successful completion of this course, the student should be able to:
- Install and troubleshoot a server installation.
- Identify and explain the components of a Upgrade and/or Migration.
- Modify server components for server management and optimization.
- Configure and troubleshoot client management.
- Design an eDirectory structure.
- Define and manage IP and Internet services.
- Explain database repair procedures using various NetWare tools.
Prereq. NET 230
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

NET 232 Novel Network Design & Implementation
This course provides students the necessary skills to design and create a NetWare 6.x implementation plan. Students will consider design strategies and implementations and complete a NetWare installation. Students will also learn Novell server tools. The class will focus on Novell’s eDirectory including preparation, tree design, troubleshooting and accessibility.

Upon successful completion of this course, the student should be able to:
- Perform a Netware 6.x server install.
- Develop a migration plan based on tools provided with NetWare 6.x.
- Define advanced Novell Storage Management and implementation.
- Describe ifolder configuration management.
- Develop a Novell Cluster Services solution.
- Describe and manage Novell troubleshooting tools.

Describe and implement Novell eDirectory preparation, tree design, troubleshooting and accessibility.

Prereq. ENG 050, REA 050 and MAT 040
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

NET 241 Network Protocols TCP/IP
This course gives the students the skills necessary to procure an Internet address, configure a Subnet mask, assign IP addresses and troubleshoot common IP address problems. The course also gives the students the skills necessary to use common TCP/IP applications including Telnet and FTP.

Upon successful completion of this course, students should be able to:
- Explain the differences between the DoD Protocol model and the OSI model.
- Discuss data multiplexing, switching, bridging and routing technologies.
- Explain IP addressing using dotted decimal notation and assign IP addresses.
- Identify and troubleshoot datagram delivery, routing tables, Exterior Gateway Protocol (EGP) and Internet Control Message Protocol (ICMP).
- Discuss data stream maintenance, windowing, and host and network file setups.
- Identify and troubleshoot Domain Name Services (DNS), File Transfer Protocol (FTP), Trivial File Transfer Protocol (TFTP), Telnet, Simple Network Management Protocol (SNMP), and Simple Mail Transfer Protocol (SMTP).
- Configure hosts, networks, gateways, protocols and services.
- Discuss BOOTP, DHCP, SLIP and PPP.
- Discuss planning technologies for router configuration, IP tunneling, DHCP servers and SNMP.

Prereq. or Coreq. NET 231
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

(NUS) Nursing
NUS 102 Nursing Mathematics: Dosage Calculation and Drug Preparation
Nursing Mathematics covers adult drug preparation, dosage calculation, and intravenous fluids and medications administration. Measurement requirements, system conversions, oral and parenteral dosage calculations, and intravenous fluid flow rates are covered in detail. Nursing implications for drug administration are emphasized in every unit including a brief overview of drug label interpretation, and pediatric and geriatric dosage considerations. Upon successful completion of this course, students should be able to:
- Calculate mathematical problems working with fractions, decimals, and percents.
- Solve drug dosage problems using ratio and proportion.
- Use system conversions [metric and household] for volume and weight problems.
- Calculate oral and parenteral dosage problems in the same system and in different systems.
- Measure drugs administered in units.
- Identify pediatric and geriatric considerations for drug administration.
- Calculate intravenous fluid flow rates (drops per minute and milliliters per hour) and infusion times.
- Identify abbreviations and Symbols for drug preparation and administration.
- Accurately read and interpret a drug label in relation to a medication order.

Prereq. MAT 060
1 Credit 1 Weekly Lecture Hour

NUS 110 Fundamentals of Nursing
The nursing process is presented as the method utilized by the nurse in health maintenance of individuals across their life span and that of their families. Knowledge and skills essential to nursing practice in meeting individual’s basic needs are emphasized. Clinical laboratory experiences incorporate the use of advanced technologies in order to provide competent care to patients with common health maintenance needs.

Upon successful completion of this course, students should be able to:
- Identify fundamental concepts of nursing practice used to administer therapeutic nursing interventions to patients of varied cultures across the life span.
- Identify how individuals respond to need interferences to achieve and maintain an optimum level of wellness on the health-illness continuum.
- Identify how an individual’s basic needs serve as a motivator for biophysical functioning and psychosocial behavior.
- Implement fundamental concepts of nursing practice to promote and maintain health in patients.
- Demonstrate use of fundamental nursing skills utilizing advanced technologies when caring for patients in structured health care settings.

Coreq. BIO 117, ENG 100, PSI 140, NUS 102
8 Credits 4 Weekly Lecture Hours 8 Weekly Laboratory Hours

NUS 111 Nursing Concepts and Practice I
Students are provided opportunities to integrate knowledge of facts, principles, and advanced technologies acquired in general and nursing education courses previously studied. Application of biophysical and psychosocial factors form the basis of assessing patient’s needs, and diagnosing, planning, implementing and evaluating the nursing care of patients with common medical-surgical problems. Structured clinical laboratory experiences are provided concurrent with nursing theory.

Upon successful completion of this course, students should be able to:
- Describe how interference with oxygenation affects patients and influences the nursing process.
- Describe how interference with safety/security affects patients and influences the nursing process.
- Describe how interference with the absorption and utilization of nutrients affects patients and influences the nursing process.
- Describe how need interference with regulatory function affects patients and influences the nursing process.
- Describe how need interference with activity affects patients and influences the nursing process.
- Demonstrate critical thinking skills utilizing advanced technologies when caring for patients with common health problems in a variety of structured health care settings.

Prereq. NUS 110, Coreq BIO 118
10 Credits 4Weekly Lecture Hours 12 Weekly Laboratory Hours

NUS 205 Perioperative Nursing
The knowledge and technique necessary to assume responsibilities of the perioperative nurse are emphasized in this broad-based yet comprehensive orientation to the operating room and the perioperative role. Standards of patient care in the operating room are explored and identified. Assessment of patient needs and implementation of nursing interventions are emphasized. Collaborative decision making is reviewed relative to total intraoperative care. Subject material guides the learner to provide for and contribute to patient safety through control of internal and external environment, biological testing and product evaluation, as well as to assist the patient with the management of anxiety through the principles of biological, physical and social sciences. The College recognizes the standards of perioperative nursing practice of the AORN as the conceptual basis of specialty practice in the OR.

Upon successful completion of this course, students should be able to:
- Describe the psychosocial influences affecting the patient’s response to surgical intervention.
- Demonstrate knowledge necessary to implement the perioperative role.
- Discuss principles of asepsis used in providing patient care during the intraoperative period.
- Analyze the conceptual basis of role function as an interdisciplinary team member in delivery of care to the operative patient.
- Plan nursing activities that reflect the nursing process in providing care to the patient undergoing surgical intervention.
- Discuss principles of asepsis used in providing patient care during the intraoperative period.
- Relate nursing, legal and ethical boundaries in the practice of professional nursing in the operating room.
- RN Licensure or eligibility

3 Credits 3 Weekly Lecture Hours

NUS 206 Perioperative Preceptorship
The skills needed by the nurse to practice professional nursing in the operating room are emphasized. Under the tutelage of an operating-room nurse preceptor, with the guidance of the College faculty facilitator, the learner is
introduced to the activities performed by the nurse in the operating room throughout the patient's surgical experience. Learners will function within the scope and multiple dimensions of the perioperative role as defined in the preceptor institution.

Working with guidelines developed by the College in collaboration with a local AORN advisory board, the preceptorship is a 15-day clinical practice. Preceptors are selected by the OR nurse manager in the preceptor hospital. Preceptorship sites may be arranged by the learner or selected from the College's preceptor affiliate sites. Schedules for clinical activities are mutually arranged by students and preceptor.

Upon successful completion of this course, students should be able to:

- Assess the pathophysiological and psychosocial influences affecting the patient's response to surgical intervention.
- Demonstrate the knowledge and skills needed to implement the perioperative role.
- Apply principles of asepsis in providing patient care during the intraoperative period.
- Function as a member of the interdisciplinary team in providing patient care during the intraoperative period.
- Demonstrate application of the nursing process in providing nursing care to the patient receiving surgical intervention.

3 Credits 3 Weekly Lecture Hours

NUS 207 RN First Assistant

The knowledge and technique necessary to assuming responsibilities of the RN First Assistant are emphasized. The role diversity of the first assistant is explored in its independent relationship, as the nurse works both with the physician and for the benefit of the patient. The nursing diagnosis is used as the defining guide in planning and implementing patient care. Expanded functions are stressed and elaborated as the nurse is prepared to assume responsibility in scrubbing, draping, retracting, exposing, clamping, ligating and suturing. Intellectual and manual dexterity are combined to prepare the nurse with the essential skills necessary to this expanded professional role. The College recognizes AORN's position statement on the role of the RN First Assistant. The program meets AORN Education Standards and is accepted by the Certification Board for Perioperative Nursing.

Upon successful completion of this course, students should be able to:

- Trace the historical role of the nurse in the operating room.
- Apply principles of asepsis, infection control, physical assessment and the nursing process.
- Review surgical anatomy, physiology and operative techniques related to first assisting.
- Recognize surgical hazards and initiate appropriate corrective and preventive action.
- Validate intraoperative nursing behaviors of handling tissue, providing exposure, using surgical instruments, suturing and providing hemostasis.

2 yrs Perioperative Experience

3 Credits 3 Weekly Lecture Hours

NUS 208 RN First Assistant Internship

The RN First-Assistant Directed Internship offers clinical preparation for perioperative nurses in first assisting. This internship is based on certain assumptions about the rights of patients and needs of the learner. The College attaches significance to the patient's right to have a qualified assistant during surgical intervention. The perioperative nurse who is prepared as a first assistant is capable of acting collaboratively in assisting both surgeon and patient. The College also believes that the perioperative nurse entering this internship will be a highly motivated individual and bring to the internship personal and professional experience of high quality. Flexibility and respect for individual student goals are essential in planning the internship. Therefore, each student has an active part in determining objectives, identifying learning resources and evaluating attainment of goals. Students work with a College faculty facilitator and surgical preceptor during the internship. The College recognizes AORN's position statement on the role of the RN First Assistant. The program meets AORN Education Standards and is accepted by the Certification Board for Perioperative Nursing.

Upon successful completion of this course, students should be able to:

- Demonstrate application of principles of asepsis and infection control, physical assessment and nursing process.
- Recognize surgical anatomy and physiology and operative technique related to first assisting.
- Demonstrate skill in recognizing surgical hazards and initiate appropriate corrective and preventive action.
- Carry out intraoperative nursing behaviors of handling tissue, providing exposure, using surgical instruments, suturing and providing hemostasis.

The following must be submitted prior to registering for the Internship:

- A letter from the department manager validating the nurse's experience (in years), proficiency in scrub and circulator roles, ability to perform in stressful and emergency situations, and ability to perform effectively and harmoniously as a team member.
- A copy of the display portion of the professional license to practice nursing in the state in which the internship is to be done.
- Evidence of current professional malpractice insurance (policy and cancelled check)
- Completed health examination (form supplied by the College)
- Evidence of current health insurance policy.
- Evidence of current CPR certification (ACLS)

Upon successful completion of this course, students should be able to:

- Use leadership skills to manage nursing care for a group of patients.
- Analyze pertinent ethical and legal issues in the practice of nursing.
- Integrate previously learned knowledge when providing care to the older adult.
- Integrate previously learned knowledge when providing care to patients with complex need interferences in oxygenation.
- Integrate previously learned knowledge when providing care to patients with complex need interferences in sensory-motor functions.
- Evaluate the outcome of the nursing process when caring for patients with complex multi-system needs utilizing advanced technologies.

Upon successful completion of this course, students should be able to:

- Differentiate between bipolar and unipolar leads.
- Identify appropriate materials for blood electrocardiography.
- Describe the components and function of blood.
- Differentiate between bipolar and unipolar leads.
- Identify the most commonly used monitoring leads.

Upon successful completion of this course, students should be able to:

- Use leadership skills to manage nursing care for a group of patients.
- Analyze pertinent ethical and legal issues in the practice of nursing.
- Integrate previously learned knowledge when providing care to the older adult.
- Integrate previously learned knowledge when providing care to patients with complex need interferences in oxygenation.
- Integrate previously learned knowledge when providing care to patients with complex need interferences in sensory-motor functions.
- Evaluate the outcome of the nursing process when caring for patients with complex multi-system needs utilizing advanced technologies.

Upon successful completion of this course, students should be able to:

- Identify basic anatomy and physiology of the heart.
- Describe the course an electrical impulse follows through the heart's normal conduction pathway.
- Identify the normal components of the EKG.
- Recognize effects of sympathetic and parasympathetic stimulation on heart rate, conductivity and myocardial contraction.
- Analyze various cardiac rhythms and dysrhythmias.
- RN's or Student Nurses after First Semester

1 Credit 1 Weekly Lecture Hour

NUS 215 Arrhythmia Interpretation

This course is structured to provide the student with cognitive knowledge that enables identification of basic cardiac arrhythmias. Course content reviews the anatomy, physiology, and electrical conduction system of the heart; proceeds into the area of understanding the normal and abnormal EKG, and progresses into basic rhythm disturbances.

Upon successful completion of this course, students should be able to:

- Identify basic anatomy and physiology of the heart.
- Describe the course an electrical impulse follows through the heart's normal conduction pathway.
- Identify the normal components of the EKG.
- Recognize effects of sympathetic and parasympathetic stimulation on heart rate, conductivity and myocardial contraction.
- Analyze various cardiac rhythms and dysrhythmias.
- RN's or Student Nurses after First Semester

1 Credit 1 Weekly Lecture Hour

NUS 216 Phlebotomy & EKG

This course is structured to provide the student nurse and other health care providers psychomotor skills that include performing venipuncture and recording electrocardiography.

Upon successful completion of this course, students will be able to:

- Interprete basic hematology laboratory tests.
- Describe the components and function of blood.
- Identify appropriate materials for blood specimen collection.
- Perform venipuncture skills correctly and successfully.
- Discuss complications associated with blood collection.
- Identify reasons for failure in obtaining blood specimens.
- Describe basic anatomy and physiology of the heart.
- Operate a basic 12-lead EKG machine.
- Identify the most commonly used monitoring leads.

Upon successful completion of this course, students should be able to:

- Apply principles of asepsis, infection control, physical assessment and the nursing process.
- Review surgical anatomy, physiology and operative techniques related to first assisting.
- Recognize surgical hazards and initiate appropriate corrective and preventive action.
- Validate intraoperative nursing behaviors of handling tissue, providing exposure, using surgical instruments, suturing and providing hemostasis.

2 yrs Perioperative Experience

3 Credits 3 Weekly Lecture Hours

NUS 210 Nursing Concepts and Practice II

NUS 210 builds on the knowledge and skills gained in previous college courses and in NUS 110 and 111 specifically. The nursing processes of assessment, diagnosis, planning, implementation and evaluation are identified and explained for a selection of patients across the lifespan who have complex psychological and physiological need interferences. In concurrent clinical practice, students will demonstrate knowledge and skills, integrating pharmacology, nutrition, communication principles, and utilizing advanced technologies.

Upon successful completion of this course, students should be able to:

- Use the nursing process in the care of patients with complex need interferences with safety and security.
- Use the nursing process in the care of patients with complex need interferences in fluid and electrolyte balance.
- Use the nursing process in the care of patients with complex need interferences in oxygenation.
- Use the nursing process in the care of patients with complex need interferences in the utilization of nutrients.
- Use the nursing process in the care of patients with complex need interferences in renal and electrolyte balance.

10 Credits 4 Weekly Lecture Hours 12 Weekly Laboratory Hours

NUS 211 Nursing Concepts and Practice III

NUS 211 provides the student with the opportunity to integrate previously acquired knowledge with new concepts and technologies relating to patients with complex multi-system needs. Ethical and legal aspects, and principles of management are explored. The use of case studies provides the student the opportunity to explore nursing management of selected patient situations. Application of theory is in acute, long-term care and community settings. The student will gain an appreciation for the scope of nursing practice by integrating the roles of provider and manager of care.

Upon successful completion of this course, students should be able to:

- Use leadership skills to manage nursing care for a group of patients.
- Analyze pertinent ethical and legal issues in the practice of nursing.
- Integrate previously learned knowledge when providing care to the older adult.
- Integrate previously learned knowledge when providing care to patients with complex need interferences in oxygenation.
- Integrate previously learned knowledge when providing care to patients with complex need interferences in sensory-motor functions.
- Evaluate the outcome of the nursing process when caring for patients with complex multi-system needs utilizing advanced technologies.

Upon successful completion of this course, students should be able to:

- Identify basic anatomy and physiology of the heart.
- Describe the course an electrical impulse follows through the heart's normal conduction pathway.
- Identify the normal components of the EKG.
- Recognize effects of sympathetic and parasympathetic stimulation on heart rate, conductivity and myocardial contraction.
- Analyze various cardiac rhythms and dysrhythmias.
- RN's or Student Nurses after First Semester

1 Credit 1 Weekly Lecture Hour

COURSE DESCRIPTIONS 135
• Identify the normal components of the EKG.
• Describe the course that an electrical impulse follows when conducted through the heart’s normal conduction pathway.
• RN’s or Student Nurses after First Semester
1 Credit 1 Weekly Lecture Hour

NUS 217 IV Skills
This course provides students with the knowledge and basic principles to perform the skills of IV therapy with confidence and safety. The theory introduced includes the history of IV infusions, purposes of IV infusions, the anatomy of the circulatory system, fluid and electrolyte balance. Legal issues, documentation, medications, alternative IV infusion systems, as well as possible complications will also be discussed. Students will then be given the opportunity to become acquainted with the equipment needed to perform venipuncture in addition to hands-on experience in the actual venipuncture technique. By the close of this course there will be an ability to integrate the theory and practicum to successfully perform, maintain and troubleshoot IV’s with safety and confidence.

Upon successful completion of the course, students should be able to:
• Identify the purposes of IV infusions.
• Identify the most common sites for venipuncture.
• Recognize abnormal signs and symptoms of electrolyte imbalance.
• Identify the legal limitations in the practice of administering IV therapy.
• Demonstrate proper documentation of IV assessments and management.
• Describe complications of IV therapy and proper infection control techniques.
• Utilize proper technique in performing venipuncture.

Prereq. NUS 111 or RN’s or LPNs
1 Credit 1 Weekly Lecture Hour

NUS 218 LPN Concepts
This course is intended to facilitate the transition of the Licensed Practical Nurse to the Associate Degree Nursing Program and then to the role of the Registered Nurse. The curriculum from the first year of the nursing program will be reviewed. Upon successful completion of this course, the student should be able to:
• Evaluate the philosophy and outcome competencies of the college and the nursing program.
• Compare LPN education to the first year of the program.
• Utilize the college resources: Learning Center, Library, Career and Counseling Center, especially services and information related to nursing education.
• Complete a Personal Education Plan that describes the transition from LPN to RN.
• Interpret the Nursing 110 and Nursing 111 syllabus, modules and clinical packets and the student requirements.
• Develop critical thinking and test taking skills related to multiple choice questions.
• Demonstrate proficiency in selected nursing skills.
• Interpret the transcultural influences on nursing care.
• Compare and contrast the different roles of the LPN and the RN.

Prereq. NUS 210, ENG 100, PSY 140, NUS 102
3 Credits 3 Weekly Lecture Hours

NUS 219 Advanced Physical Assessment
This course will provide strategies that promote effective history-taking along with cognitive and psychomotor skills needed for physical assessment evaluation. The assessment of body systems includes an overview of anatomy and physiology, common complaints, techniques necessary to perform inspection, palpation, percussion and auscultation; interpretation of findings with common abnormal findings. Classroom theory and assessment techniques are integrated into the laboratory experience. Upon successful completion of this course, students should be able to:
• Use the appropriate communication skills necessary to complete a health history.
• Demonstrate the four examination techniques of inspection, palpation, percussion and auscultation.
• Identify the major cultural variables to be addressed in a health assessment.
• Complete a health history that includes information on the assessment/functioning of skin, hair, nails, head, face, neck, ears, nose, throat, eyes, respiratory system, cardiovascular system, neurological system, musculoskeletal system, abdomen, breast and axilla, male and female genitalia.
• Perform a physical examination to validate information obtained in the health history.
• Identify normal and abnormal subjective findings during the physical assessment evaluation.

Prereq. NUS 111 or RN’s
1 Credit 1 Weekly Lecture Hour

NUS 220 Clinical Enhancement Skills
This course is structured to provide the student and other health care provider with the enhanced clinical skills, knowledge, psychomotor expertise, and basic principles to perform and record electrocardiography, arrhythmia interpretation, and phlebotomy. The identification of normal and abnormal EKGs including the review of the anatomy and physiology of the electrical conduction system of the heart will be covered. Legal issues will be discussed along with appropriate documentation, IV medications and alternative IV infusions systems. By the end of the course, the student will have the ability to integrate theory and practice to safely and with confidence identify normal and abnormal cardiac rhythms, successfully perform phlebotomy, maintain, and troubleshoot IV infusions, and perform and record electrocardiographs. Upon successful completion of the course, the student should be able to:
• Describe basic anatomy and physiology of the heart.
• Operate a basic 12-lead EKG machine.
• Differentiate between bipolar and unipolar leads.
• Identify the most commonly used monitoring leads.
• Identify the normal components of the EKG.
• Describe the course that an electrical impulse follows through the normal conduction pathway of the heart.
• Recognize effects of sympathetic and parasympathetic stimulation on heart rate, conductivity, and myocardial contraction.
• Analyze various cardiac rhythms and dysrhythmias.
• Analyze basic laboratory tests.
• Describe the components and function of blood.
• Identify appropriate materials for blood specimen collection.
• Identify reasons for complications and failure to obtain blood specimens.
• Identify the purpose of IV infusions.
• Identify the most common sites for venipuncture.
• Recognize abnormal signs and symptoms of electrolyte imbalance.
• Identify the legal limitations in the practice of administering IV therapy.
• Demonstrate proper documentation of IV assessments and management.
• Describe complications of IV therapy, and proper infection control techniques.
• Demonstrate proper techniques for central line care.
• Demonstrate proper technique for administration of direct IV push medications.
• Utilize proper techniques in performing venipuncture.

Prereq. NUS 111, RN’s or grad Nurses
3 Credits 2.5 Weekly Lecture Hours 1 Weekly Laboratory Hour

NUS 221 Pharmacology for Health Care
This course focuses on the clinical aspects of pharmacology. The nurse needs to know to provide safe and effective care for patients taking medications. Basic principles of pharmacology are reviewed. Medications are grouped for study according to body systems and drug action. Emphasis is on application of the nursing process, including patient education, to enhance effectiveness of medication therapy. Upon successful completion of this course, students should be able to:
• Explain the relationship of pharmacokinetics and pharmacodynamics to drug therapy.
• Describe the mechanisms of action, therapeutic effects, adverse effects, interactions, indications and administration of commonly used groups of drugs.
• Relate the pharmacodynamics of common groups of drugs to the conditions for which they are prescribed.
• Use the nursing process to develop an age-appropriate plan of care for the patient receiving drug therapy.
• Identify nursing responsibilities for accurate administration of medications.

Prereq. NUS 110
3 Credits 3 Weekly Lecture Hours

NUS 222 Holistic Advanced Physical Assessment and Pathophysiology
This course will provide the student with the knowledge and skills to identify abnormal physiologic findings. The student will utilize this knowledge and skill in completing a health history and physical assessment, identifying the patient’s biopsychosocial status.

Upon successful completion of this course, students should be able to:
• Use the appropriate communications skills necessary to complete a health history.
• Demonstrate the four examination techniques of inspection, palpation, percussion and auscultation.
• Identify the major cultural variables to be addressed in a health history and physical assessment.
• Complete a health history that includes information on the assessment/functioning of skin, hair, nails, head, face, neck, ears, nose, throat, eyes, respiratory system, cardiovascular system, neurological system, musculoskeletal system, abdomen, breast and axilla, male and female genitalia.
• Identify body structures and functions that need to be assessed in specific disorders.
• Explain how the signs and symptoms of specific disorders are produced by the alterations in body structure and function.
• Correlate subjective complaints with pathophysiologic findings upon physical assessment.
• Recognize the social and ethical concerns involved in the evaluation of patient health concerns and the obligation of confidentiality.
• Perform a physical examination to validate information obtained in the Health history.

Prerequisites/Co-requisites:
For nursing students: Successful completion of a minimum of one year in a basic RN program including basic anatomy and physiology courses.
For paramedic students: Successful completion of BIO 118 for graduate and registered nurses: No pre-requisites.

Prereq. NUS 111
3 Credits 3 Weekly Lecture Hours
PCT 101 Introduction to Process Technology

This course provides an overview of the concepts associated with Process Technology, as well as an introduction to the role of a Process Operators and Process Control Technicians as part of a team in the production environment. The course also provides a basic overview of issues and sciences associated with the refining and production of chemicals. In addition, the course will introduce the student to the real life environment, and the occupational responsibilities and duties of process operators/technicians.

Upon successful completion of this course, students should be able to:
• Discuss the role and responsibilities of a process operators and process control technicians.
• Investigate the basic sciences associated with processing industries.
• Identify the need for quality control in a processing environment.
• Demonstrate appropriate behavior within a diverse workplace.
• Discuss the impact of job related work ethics (absenteeism, on-the-job habits, etc.) as they relate to fellow workers, and the mission at hand.
• Relate basic safety, health, and environmental issues associated with the processing industries technology.
• Perform generalized introductory duties while observing acceptable practices for personal safety and health.
• Prepare a potential career profile for a process technician.

PCT 110 Plant Equipment

This course provides an introduction to basic hand tools as well as a study of industrial plant equipment. Topics of study include equipment construction, principles of operation, care, maintenance, and utilization. Various pieces of equipment associated with process systems will be covered. Equipment being studied will include motor drive components, basic material handling equipment, pumps, compressors, valves, boilers, furnaces, turbines, heat exchangers and cooling towers, as well as relevant instrumentation.

Upon successful completion of this course, students should be able to:
• Identify various types of plant equipment commonly found in processing plants.
• List the various types valves, and discuss their basic operational characteristics, as well as their components.
• Explain how pipe is sized, relate the differences between pipe and tubing, and describe how a seal is effected in each design.
• Distinguish between the various types of pumps, compare and contrast their appropriate uses.
• Describe the various types of compressors, compare and contrast their appropriate uses and operational procedures.
• List the common types of motors; electric, air, and hydraulic and discuss their applications.
• Recognize power transmission devices and describe, their use, care, and maintenance.
• Describe the different types of turbines, compare and contrast their respective uses, their care, and maintenance.
• Explain the principles of operation, care, and use of heat exchangers within a processing environment.
• Discuss the differences between furnace types, their construction, principles of operation, components; care and maintenance.
• Describe the various types of process equipment, comparing appropriate uses, maintenance, and relevant troubleshooting requirements.

PCT 111 Process Technology I

This course is designed to provide operators/technicians with an introduction to the basic operating principles of process control systems. Topics of study will include control principles, the elements of process control systems, and process control signals and systems. The course also provides for an introductory study of various input and output devices used to control process variables in the petroleum, petrochemical, chemical, pharmaceutical, and food processing industries. Primary emphasis will be placed on processes that require the measurement of pressure, level, flow, and temperature.

Upon successful completion of this course, students should be able to:
• List the basic principles, characteristics and applications of process control systems.
• Describe the various methods used to implement process control systems.
• Explain the methods used to generate process control signals.
• Define the basic concepts concerning transducers, as well as investigate the different types of output devices and signals used to control processes.
• Describe the nature of fluids as well as the causes and effects of hydrostatic and dynamic pressure.
• Describe fluid flow, characteristics of pressure, and pressure head, in regard to process control parameters.
• Describe the instruments, methods and principles of operation used to measure pressure, level, and flow in fluids.
• Determine the various operating conditions of pressure switches.
• Relate the concepts of heat exchange.
• Describe the physical changes heat produces in matter.
• Determine the major differences between AC and DC motor operation, the fundamental methods of controlling each, and some of the problems associated with each type.
• Explain closed loop control system theory relating to the purpose of closed loop control and the different modes of controller operation.
• Discuss some of the more advanced aspects of automatic controllers, with relevance to safety and alarming of controllers.
• Identify the real time limitations and implications and process characteristics required to transmit serial information between MTU and RTUs with regard to the limiting factors of a real time SCADA system.
• Explain the primary purpose of process control and identify the four main processes variables associated with process control regulations.

Upon successful completion of this course, students should be able to:
• Specify the need and demonstrate the usage of basic personnel protective equipment.
• Relate the use of typical facilities safety equipment, and its application, in specific instances.

PCT 115 Process Technology II

This course presents additional theory and application of process control. Integrated topics such as drawings, symbols, control loops, measurements and variable measurements will be presented. Additionally, topics to be studied will include, but not be limited to: conductivity, pH, ORP, various optical measurements, products of combustion, chromatography, and control systems. Process control computers, DCS, and system integration will also be discussed in detail.

Upon successful completion of this course, students should be able to:
• Interpret and use the various types of process control drawings, to include the use of process control symbols and their application.

• Describe the operational characteristics of a typical control loop.

• Compare the different modes of operation of control loops.

• Investigate the four common advanced control methods, the advantages of each, and their applications in an industrial facility.

• Describe how control loops perform in the time domain and how compensation is affected for time lags in the system response.

• Determine the methods used to protect control loops.

• Explain various types of process control instrumentation used to measure conductivity, pH, ORP, products of combustion and chromatography.

• Discuss the optical analyzer, and how frequency of infrared, ultraviolet and visible light are measured.

• List the products of combustion, and identify the instrumentation used to measure and control it in a process control system.

• List the various types of process control devices including instruments used to measure conductivity, pH, ORP, optical parameters.

• Discuss microprocessors, specifically their application in process control systems.

• Describe the workings of a SCADA system

• Identify the advantages of automatic process control as well as PLC's (or DC's) in industrial automation and relate the types of processes control.

Preq. PCT 111 and CHE 106

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

PCT 120 Unit Operations

This course provides for a study of the basic principles and operation of the main units associated with the production of product in the processing industries. The primary emphasis of study will focus on processing units operation. Processes involving the principles of fluid mechanics heat transfer including evaporation, mass transfer including distillation, and mechanical separation will be explored. The basic processes being facilitated within the various units will be examined. The interactions and the transactional phenomenon occurring during operation of these units will be addressed. The commonalities, results, and effects, associated with various processes will be related to various allied chemical-manufacturing operations. Instructional emphasis will be limited to the relevant theoretical and practical aspects of the subject matter.

Upon successful completion of this course, students should be able to:

• Determine how to analyze a complex process in order to identify sub-processes, as they relate to a unit and its operation.

• Describe a unit’s operation and relate whether its processing characteristics entail a chemical or a physical reaction.

• Assist an engineer in solving problems associated with each operation and in some instances; with direction, apply solutions to problems.

• Identify the differences among similar pieces of equipment, their varied operational characteristics, and the safety practices associated with each.

• Troubleshoot basic problems with mechanical equipment and identify and/or recommend necessary corrective action for proper unit operation.

• Identify and correct blockage in fluid lines.

• Recognize problems associated with pumps and identify correct action.

Preq. MAT 111 or higher and CHE 106

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

PHI 100 Introduction to Philosophy

This course is intended for the beginning student in philosophy. This course is an investigation of philosophical problems as they are treated either by historical or contemporary authors. The philosophical problems discussed may include issues taken from the following areas of philosophy: ethics (moral theory and its applications), metaphysics (the study of the basic properties of reality), epistemology (the theory of knowledge), natural theology (arguments for the existence of God that take the natural world as evidence for God’s existence), aesthetics (the theory of beauty and its manifestation in art) and political philosophy (the study of ethical principles to govern human society). Upon successful completion of this course, students should be able to:

• Identify the basic elements of sound reasoning and make a cogent argument for a position.

• Present and analyze the major philosophical problems discussed in class.

• Analyze the major philosophical problems discussed in class.

• Identify the philosophers discussed in class and present their views.

• Critique the views of the philosophers discussed in class.

• Apply the philosophical method of argumentation to issues in daily life.

Preq. ENG 100

3 Credits 3 Weekly Lecture Hours

PHI 110 Contemporary Moral Problems

This course is intended for the beginning student in philosophy. In this course, students, after acquiring basic argumentative skills and some background in moral theory, will examine several different contemporary moral problems. The moral problems discussed may include: the legalization of narcotic drugs, abortion, affirmative action, euthanasia, capital punishment, the ethical treatment of animals, etc. The purpose of the class is to discuss the above issues from a reasoned, philosophical perspective.

Upon successful completion of this course, students should be able to:

• Identify the basic elements of sound reasoning and make a cogent argument for a position.

• Present the major philosophical problems discussed in class.

• Analyze the major philosophical problems discussed in class.

• Present the ethical theories discussed in class.

• Present the ethical theories discussed in class.

• Identify the philosophers discussed in class and present their views.

• Critique the views of the philosophers discussed in class.

• Formulate and rationally defend an ethical position on a contemporary moral problem.

• Apply the philosophical method of argumentation to issues in daily life.

Preq. ENG 100 or better.

3 Credits 3 Weekly Lecture Hours

PHY 100 Technical Physics I

This course is a continuation of Technical Physics I. Here, certain concepts presented in the first semester are expanded in more detail, along with the introduction of new concepts. Upon successful completion of this course, the student should be able to:

• Describe in mathematical expressions the energy associated with matter or charge due to its motion (Kinetic energy) or due to its position or configuration (Potential energy), develop and apply the conservation of energy principle using these expressions, apply the conservation energy principle to the fluidal system (Bernoulli’s equation), electrical system (Kirchoff Loop Rule) and the thermal system (1st Law of Thermodynamics), and state the conditions and terms used to describe simple harmonic motion.

• Establish and define the concept of momentum, state the momentum/impulse theorem, derive the conservation of momentum principle, and relate the concept of momentum to energy transfer in mechanical, fluidal, electrical and thermal systems.

• Establish the concept of an electric field and flux lines, state the electric field expressions for different configurations of charge, establish the concept of a magnetic field, describe the induction effects associated with a moving magnetic field, and describe the physical and mathematically the operation of an oscillating inductor-capacitor circuit.

• Describe the creation of an electromagnetic wave, identify the different regions of the electromagnetic spectrum, apply the concepts of physical and geometrical optics to mirrors and lenses.

• Describe the operation of sensors, transducers, and other typical measurement devices by the application of the concepts and principles acquired throughout the course.

Preq. PHY 100

3 Credits 3 Weekly Lecture Hours

PHY 105 Physical Science

This course is a general survey of physical science includes the study of forces, motion, work, energy, sound, electricity, light and optics. The course is intended for non-science majors interested in exploring the concepts of physical science. Upon successful completion of this course, students should be able to:

• Describe the importance of science in contemporary society and how science knowledge is constructed.

• Explain the common units of mass, length, and time in both the English and metric systems and the derived units necessary for the calculations and measurements.
of the physical phenomena studied in this course.
- Describe the motion of simple objects in terms of distance, velocity, and acceleration.
- Explain the motion of simple objects in terms of forces and energies.
- Discuss the nature of mechanical waves and apply this knowledge to problems involving sound phenomena.
- Generate an explanation of light phenomena using geometrical, reflection, and refraction.
- Discuss the nature of electrostatic forces and electricity concepts such as current, voltage, and resistance.
- Describe magnetic forces and fields and design a simple motor.
- Apply laboratory skills and computer technology to solve problems in a cooperative environment.

Prepar. MAT 060 and REA 050

4 Credits  3 Weekly Lecture Hours

2 Weekly Laboratory Hours

PHY 110 College Physics I

This is a course designed for science majors who are not in the calculus sequence. The course deals primarily with Mechanics and Thermodynamics.

Upon successful completion of this course, students should be able to:
- Describe motion in one dimension
- Apply vector mathematics to explain two-dimensional motion
- Describe and analyze freely-falling objects
- Analyze motion using Newton’s Laws
- Apply conservation laws
- Describe rotational motion
- Analyze and apply the basic concepts of thermodynamics
- Apply laboratory skills and computer-based technologies to solve problems in a cooperative environment.

Prepar. MAT 140

4 Credits  3 Weekly Lecture Hours

2 Weekly Laboratory Hours

PHY 111 College Physics II

This course is a continuation of College Physics I and is designed for Science majors who are not in the University Physics sequence. The course deals primarily with Electricity and Magnetism, Waves and Optics, and Modern Physics topics. Upon successful completion of this course, the student should be able to:
- Describe electrostatic interactions in terms of force, fields, energy, and potential.
- Analyze circuits using Ohm’s Law and Kirchhoff’s Rules.
- Describe the magnetic fields of simple geometries and their interactions with charged objects.
- Define waves and their interactions.
- Apply wave concepts to explain sound phenomena.
- Apply the concepts of geometric and wave optics to the phenomena of refraction, reflection, interference, and diffraction.
- Discuss the development of the atomic model and quantum mechanics.
- Use concepts of nuclear physics to describe decay processes.
- Apply laboratory skills and computer technology to solve problems in a cooperative environment.

Prepar. PHY 110, Coreq. MAT 141

4 Credits  3 Weekly Lecture Hours

2 Weekly Laboratory Hours

PHY 131 University Physics I

This course is designed for Natural Science and Engineering majors who are required to take a calculus-based physics course. Dealing primarily with mechanics, the course covers the linear and rotational kinematics and dynamics of, and the principles, laws and concepts pertaining to, the motion of solids, along with specific applications relating to liquids and gases.

Upon successful completion of this course, students should be able to:
- Apply the kinematics equations to determine the linear motion of a particle.
- Use the kinematics equations to determine the rotational motion of a solid.
- Apply Newton’s Laws of motion and gravity to the linear motion of a particle.
- Apply Newton’s Laws of motion to the rotational motion of a solid.
- Know and apply the concepts of work and energy to solids, liquids, and gases.
- Utilize the concepts of momentum and conservation of momentum principle to analyze the interactions of particles and solids.
- Use the concepts relating to the material properties of solids, liquids, and gases.
- Apply the concepts of periodic motion to solids experiencing simple harmonic motion.
- Develop and use the kinematics and dynamics equations for wave motion as exhibited by liquids and gases.
- Apply laboratory skills and computer technology to solve problems in a cooperative environment.

Prepar. MAT 160

4 Credits  3 Weekly Lecture Hours

2 Weekly Laboratory Hours

PHY 132 University Physics II

This course is a continuation of University Physics I and is designed for Natural Science and Engineering majors who are required to take a calculus-based physics course sequence. Dealing primarily with electricity and magnetism, the course covers the principles, laws and concepts of electrostatics and electricity, including electro-magnetic waves and physical and geometrical optics.

Upon successful completion of this course, students should be able to:
- Determine the electric field by the application of Coulomb’s Law and Gauss’s Law.
- Apply the concepts of potential difference, capacitance and resistance to direct and alternating current circuits.
- Utilize Kirchhoff’s Rules to analyze direct and alternating current circuits.
- Calculate magnetic fields by the application of the Biot-Savart Law and Ampere’s Law.
- Apply Faraday’s Law of Induction to explain the effects resulting from changing magnetic fields.
- Use Maxwell’s Equations to explain the creation and properties of an electromagnetic wave.
- Apply the concepts of geometric and wave optics to the phenomena of refraction, reflection, interference and diffraction.
- Apply laboratory skills and computer technology to solve problems in a cooperative environment.

Prepar. PHY 131 Coreq. MAT 161

4 Credits  3 Weekly Lecture Hours

2 Weekly Laboratory Hours

PLB 100 Plumbing Theory I

This course is designed to stress good solid plumbing practices applicable to all areas of plumbing. Emphasis will be placed on presenting advanced concepts and materials in the plumbing industry. Traditional approaches are covered to ensure that the student receives a broad exposure to all materials and practices that may be encountered in the work place.

Upon successful completion of this course, students should be able to:
- Test and repair gas piping.
- Describe the relationship of threads per inch to pipe size.
- Identify the various tools for threaded pipe.
- Describe the use of the tools for threaded pipe.
- Explain how pipe is cut, reamed, and threaded.
- Define the terms associated with pipe threading.
- Demonstrate the procedures necessary to properly tighten fittings on pipes.
- Tighten fittings on pipes and valves.
- Define fitting allowance.
- Interpret center-to-center measurements.
- Perform fittings to obtain end-to-end measurements.

Must be employed by a Master plumber.

5 Credits  3 Weekly Lecture Hours

PLB 101 Plumbing Theory II

This continuation course is designed to stress good solid plumbing practices applicable to all areas of plumbing. Emphasis will be placed on presenting advanced concepts and materials in the plumbing industry. Traditional approaches are covered to ensure that the student receives a broad exposure to all materials and practices that may be encountered in the work place.

Upon successful completion of this course, students should be able to:
- Perform the addition, subtraction, multiplication and division of fractions.
- Utilize ratio and proportion.
- Define the Pythagorean theorem and show its use in plumbing for finding angles and offsets.
- Solve square roots and perimeter, area, and volume problems.
- Use mathematical concepts as they relate to plumbing projects.
- Define the types of measurements used in plumbing projects.
• Identify the mathematical symbols.
• Define the use of symbols in mathematics.
• Define math procedure and math precedence.
• Relate geometry to piping mathematics.
• Define formulas/equations.
• Utilize square roots to solve triangles.
• Describe the relationship of angles formed by intersecting lines.
• Utilize the proper unit of measure for each task.
• Interpret various pipe weights and use a pipe data sheet.
• Calculate pipe clearances.
• “Take off” for fittings.
• State generic rules for fitting allowance.

Must be employed by a Master plumber and PLB 101

5 Credits 3 Weekly Lecture Hours

PLB 200 Heating Systems

This course is designed to help the heating professional become comfortable with the electrical portion of an installation or service call. The program covers basic electrical circuits, flow of electricity, switches, grounding, electrical terms and principles, electric power in the home, electric wire and supplies, tools and test equipment, transformers, electric heating components, wiring diagrams, practical wiring of a heating appliance, and troubleshooting.

Upon successful completion of this course, students should be able to:
• Identify basic electrical circuits.
• Define two Laws of Electricity and understand fundamental electrical terms.
• Describe how electric power gets to a home and some safety considerations.
• Explain types and common uses of electrical wire (conductors).
• Splice and connect wires.
• Extend a circuit and some common electrical parts.
• Use the proper tools and test equipment to perform basic electrical work.
• Demonstrate how electrical power from the Power Company transformer can reduce to low voltage components in a home.
• Identify essential electrical components of a heating system.
• Perform the basics of wiring, schematics, ladder, and pictorial diagrams.
• Read a schematic and ladder-wiring diagram, and wire a boiler.
• Troubleshoot an electrical circuit.
• Install gas utilization equipment in accordance with their listing and the manufacturer’s instructions.
• Perform methods of vent installations of venting systems.
• Discuss hydraulics and the fundamentals of cross-connections.
• Communicate historical data regarding cross-connections.
• Articulate and define various cross-connections definitions.
• Identify the various responsibilities of public and private agencies for cross-connection controls.
• Apply, define and identify the appropriate plumbing codes and standards.
• Discuss basic hydraulics and the fundamentals of cross-connection controls.
• Utilize and apply the safety program material and implementation into the workplace.
• Implement installation guidelines for backflow prevention assemblies.
• Observe the condition of the test gage equipment during all steps of the field test procedure.
• Troubleshoot and repair the problem with a backflow prevention assembly.
• Document the quality of the inspection and certification of a backflow prevention assembly.
• Report the results of the field-testing operations.
• Maintain and generate all records and certifications of all backflow prevention assembly tests performed.

Must be employed by a Master plumber

1 Credit 3 Weekly Lecture Hours

PLB 207 Cross Connection Control

This course introduces the essentials of blending theoretical and practical aspects of cross-connection controls along with specific guidelines concerning the theory of backflow prevention and administration. It provides extensive information on troubleshooting from a hands-on point of view and is designed to be used as an on-the-job troubleshooting tool. Standardized training in the backflow/cross-connection control field will be addressed.

Upon successful completion of this course, students should be able to:
• Pass ASSE (American Society of Sanitation Engineers) Backflow Certification Exam for Testers.
• Communicate historical data regarding cross-connections.
• Perform the five methods of properly controlling backflow.
• Articulate and define various cross-connections definitions.
• Identify the various responsibilities of public and private agencies for cross-connection controls.
• Apply, define and identify the appropriate plumbing codes and standards.
• Discuss basic hydraulics and the fundamentals of cross-connection controls.
• Utilize and apply the safety program material and implementation into the workplace.
• Implement installation guidelines for backflow prevention assemblies.
• Observe the condition of the test gage equipment during all steps of the field test procedure.
• Troubleshoot and repair the problem with a backflow prevention assembly.
• Document the quality of the inspection and certification of a backflow prevention assembly.
• Report the results of the field-testing operations.
• Maintain and generate all records and certifications of all backflow prevention assembly tests performed.

Must be employed by a Master plumber

3 Credits 3 Weekly Lecture Hours

PLB 208 Philadelphia Plumbing Codes

This course reviews the major aspects of Philadelphia Plumbing Code (1996 Edition). Emphasis will be placed on general regulations, plumbing definitions, materials, sanitary and storm water systems. Students will be exposed to sketching, laying out, and sizing of various systems.

Upon successful completion of this course, students should be able to:
• Determine if a back-flow prevention assembly is necessary.
• Check with your inspector on the appropriate assembly required for the job.
• Determine the minimum water pressure required at the most remote outlet on any potable water system.
• Identify the requirements for a potable water system flush-out valve.

Must be employed by a Master plumber

3 Credits 3 Weekly Lecture Hours
• Identify and operate the vacuum breaker on the discharge side.
• Demonstrate how a direct connection to a sewer or waste line can be properly utilized.
• Connect and identify appropriate pipelines.
• Size drainage and vent lines.

Must be employed by a Master plumber.

3 Credits 3 Weekly Lecture Hours

PLB 209  International Plumbing Codes
This course is designed to assist students in understanding codes and adjacent code provisions. It addresses various codes founded upon certain basic principles of environmental sanitation and safety through properly designed, acceptably installed, and adequately maintained plumbing systems will be addressed.
Upon successful completion of this course, students should be able to:
• Correct all plumbing violations.
• Size and design plumbing systems for residential and commercial buildings.
• Define various plumbing systems code.
• Change the direction of flow without restrictions regarding drainage fitting patterns.
• Apply the standards to control all materials, systems, and equipment used in the construction, installation, alteration, repair, or replacement of plumbing or drainage systems or parts.
• Test joints and connections in the plumbing system requiring gas tight and watertight for the pressure required.
• Apply the plumbing code regarding how fixtures shall be separately trapped by a water seal trap and placed as close as possible to the fixture outlet.
• Demonstrate the proper handling of liquid waste containing grease, flammable wastes and other ingredients harmful to the building drainage system.
• Confirm the recommendations for plumbing fixtures for accessibility use and their installation.

Must be employed by a Master plumber.

5 Credits

(PLG) Paralegal Studies

PLG 100  Introduction to Paralegal
This course focuses on four specific areas of the paralegal profession: (1) the role of the paralegal in the legal profession, (2) the legal and ethical rules that determine unauthorized practice, (3) an understanding of the judicial system at the federal, state and local level, and (4) the various areas of law-civil and criminal with emphasis on the legal terminology associated with each area.
Upon successful completion of this course, students should be able to:
• Describe the role of the paralegal in the legal profession.
• Describe the judicial system at the federal, state, and local level.
• Describe those public agencies that operate as law firms (Office of the Attorney General, Office of the District Attorney, Public Defender, and Legal Aid Society).
• Describe the jurisdiction of various governmental agencies.
• Apply relevant modern technologies.
• Discuss relevant ethical issues.

Prereq. ENG 060 and REA 060

3 Credits 3 Weekly Lecture Hours

PLG 110  Legal Research & Writing I
This course teaches students basic techniques of legal research. Students will be taught the use of primary legal information sources including statutes, cases, rules and regulations, as well as secondary sources including digests, legal encyclopedias and commentaries on the law.

The role of technology in legal research and writing will also be discussed.
Upon successful completion of this course, students should be able to:
• Identify terminology associated with legal research.
• Differentiate between the various sources used to research the law.
• Use different methods to research legal problems.
• Use the computer to do legal research.
• Discuss the methods for analyzing legal research, for identifying issues, for applying law to the facts, and for preparing and writing appropriate memorandum.
• Write legal memorandum that demonstrate an understanding of legal issues.
• Discuss relevant ethics issues.
• Apply relevant modern technologies.

Prereq. PLG 100

3 Credits 3 Weekly Lecture Hours

PLG 120  Legal Research & Writing II
This course is a continuation of Legal Research and Writing I. In this course, students will be introduced to the analysis of legal problems, the preparation of legal briefs, memorandums, and other legal documents. The applicability of research and the law to factual situations is stressed.
Upon successful completion of this course, students should be able to:
• Prepare various legal documents.
• Apply principles of legal research to factual situations in written memoranda of law and briefs.
• Use proper methods of formatting legal documents and research references in legal documents.
• Use correct methods of citing legal references.
• Compose basic written communications that are part of the practice of law.
• Analyze reported cases and statutes.
• Use and apply current forms of technology to perform legal research.
• Discuss relevant ethics issues.
• Apply relevant modern technologies.

Prereq. PLG 110

3 Credits 3 Weekly Lecture Hours

PLG 140  Contract Law
This is a course in basic contract law. Among the topics covered are the elements of a contract, the parties to a contract, modes of discharging a contract and the remedies available upon breach of a contract. Included in the course is a study of the Sales and Commercial paper provisions of the Uniform Commercial Code. Specific contracts and draft documents that are the subject of much litigation are examined and discussed. Students are required to draft simple agreements.
Upon successful completion of this course, students should be able to:
• Discuss the elements of a contract.
• Analyze the parties to a contract.
• Compare and/or contrast different contractual agreements.
• Explain the various modes of discharging a contract.
• Analyze the remedies available for breach of contract.
• Analyze the provisions of the Uniform Commercial Code with emphasis on Article 2 (Sales) and Article 3 (Commercial Paper).
• Analyze specific sales contracts and draft documents that comply with UCC requirements.
• Compare and contract contracts that are the subject of much litigation, such as Homeowner’s insurance policies, automobile insurance policies, commercial fire policies, commercial liability policies, professional liability policies, employment agreements, bailment contracts, lease agreements and agency agreements.
• Draft a simple contract.
• Discuss relevant ethical issues.
• Apply relevant modern technologies.

Prereq. PLG 110

3 Credits 3 Weekly Lecture Hours

PLG 199  Co-op/Internship
Refer to Cooperative Education and Internship description in the "Options for Earning College Credit" section of the catalog.

PLG 200  Family Law
This course introduces students to the procedural and substantive law affecting the family and domestic relations. The law affecting prenuptial agreements, separation, divorce, spousal support, alimony, spousal abuse, custody, child support and adoption is discussed. Emphasis is placed on the preparation of relevant legal documents and procedures for filing.
Upon successful completion of this course, students should be able to:
• Discuss the basic principles of family and domestic relations law.
• Research family law and domestic relations issues.
• Analyze specific divorce remedies.
• Prepare legal documents applicable to court rules and regulations in a family or domestic relations case.
• Discuss the role of human relations, emotional sensitivity, in domestic relations cases.
• Discuss the relevant ethical issues.
• Apply relevant modern technologies.

Prereq. PLG 120

3 Credits 3 Weekly Lecture Hours

PLG 210  Domestic Litigation
This course focuses on the applications of the principles of tort law and civil litigation learned in the Civil Litigation and Tort Principles (PLG 210). Emphasis is placed on the paralegal’s role in the civil and litigation process.
Upon successful completion of this course, students should be able to:
• Analyze basic negligence liability concepts applied to various intentional and unintentional torts and the applicable defenses.
• Discuss the theories of damage recovery applicable to tort matters.
• Relate fundamental principles of insurance as applied to tort litigation field. Discuss negligence problem resolution through court litigation and through the alternative remedies of negotiation, arbitration, and mediation.
• Discuss relevant ethical issues.
• Apply relevant modern technologies.

Prereq. PLG 120

3 Credits 3 Weekly Lecture Hours

PLG 211  Civil Litigation and Tort Applications
This course focuses on the applications of the principles of tort law and civil litigation learned in the Civil Litigation and Tort Principles (PLG 210). Emphasis in this course is on the paralegal’s role in the civil and litigation process.
Upon successful completion of this course, students should be able to:
• Describe the system of dispute resolution through the state and federal court systems and other alternative dispute resolution methods applicable to negligence cases.
• Describe the different parts of a negligence trial and the documents applicable to each part of the trial.
PLG 240  Criminal Law
This course introduces students to the criminal legal system and the role of the paralegal within its framework. Emphasis is placed on the basic principles of substantive and procedural criminal law under state and federal statutes, the preparation of legal documents relevant to criminal cases and the disposition of criminal cases.

Upon successful completion of this course, students should be able to:
• Discuss the basic principles of criminal law.
• Prepare legal documents relevant to criminal cases and procedures.
• Prepare a disposition of an assigned criminal case.
PreReq. PLG 210
3 Credits 3 Weekly Lecture Hours

PLG 241  Administrative Law
This course introduces paralegal students to the laws involving administration of government by various departments, agencies, boards and commissions that implement and enforce government law and policy. Students are taught the laws and procedures affecting the administrative decision-making processes on a local, state and federal government level.

Upon successful completion of this course, students should be able to:
• Describe the scope and application of Administrative Law.
• Describe the constitutional and statutory legal bases of administrative law and administration agencies on a local, state and federal level of government.
• Describe and analyze the rules, procedures and practices of government departments, agencies, boards and commissions for making rules, conducting hearings and making decisions.
• Describe and analyze the scope of authority and jurisdiction for various governmental departments, agencies, boards and commissions.
• Analyze the administrative, quasi-legislative and quasi-judicial functions of administrative departments.
• Analyze the role of legislative body, courts, statutory limits on governmental immunity and the constitution in limiting the exercise of power and authority by state, federal and local government departments, agencies, boards and commissions.
• Analyze the procedures to be followed pursuant to specific statutes: Workmen's Compensation Act for the Commonwealth of Pennsylvania; Public Utility Commission; Bureau of Professional and Occupational Affairs; Securities Commission; and the Human Relations Commission.
• Analyze the procedures to be followed with regard to the U.S. Social Security Administration (claims and appeals); various environmental protection statutes; acts involving wages and benefits; various labor protection acts; acts that prohibit discrimination, viz., Equal Pay Act, Age Discrimination Employment Act, Civil Rights Act, Title VIII.
• Analyze the procedures to be followed with regard to local zoning, licensing and building codes.
• Describe statutes that protect the public from the government including Freedom of Information Acts, Sunshine Laws (including municipal sunshine laws) and Privacy acts.
• Discuss relevant ethical issues.
PreReq. PLG 120 and PLG 140
3 Credits 3 Weekly Lecture Hours

PLG 244  Labor & Employment Law
This course focuses on the identification and application of laws regulating the interactions among employers, employees, and labor organizations representing employees. Emphasis is on the paralegal's role in labor contract negotiations, administrative and alternative dispute resolution proceedings concerning labor disputes, and the civil litigation process that arises from such disputes in both federal and state courts.

Upon successful completion of this course, students should be able to:
• Identify and discuss the labor and employment laws applicable to employer/employee relationships.
• Discuss the rules and procedures and evidence applicable to administrative proceedings, labor arbitration, and court proceedings involving labor disputes.
• Describe the role of the paralegal in providing litigation support in administrative proceedings, arbitration, and court proceedings involving labor disputes.
• Identify the role of the paralegal in providing support for collective bargaining negotiations.
PreReq. PLG 120
3 Credits 3 Weekly Lecture Hours

PLG 242  Business Organizations
This course focuses on the law of business organizations. Emphasis in the course is on corporations from formation to dissolution.

Upon successful completion of this course, students should be able to:
PreReq. PLG 120
3 Credits 3 Weekly Lecture Hours
• Discuss relevant ethical issues.
• Apply relevant modern technologies.

Prereq. ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours

POL 246 Elder Law

This course will cover various aspects of law that have particular application to the elderly client. The course is designed to familiarize the student with the practical and theoretical aspects of elder law. As more and more Americans age, legislators, jurists, and other legal professionals have to address the social and legal needs of the elderly including healthcare, employment, housing, guardianship, and elder abuse problems.

Upon successful completion of this course, students should be able to:

• Discuss the basic concept of the legal definition of “elder”.
• Evaluate the legislative responses to the aging population.
• Discuss the various types of health care problems that face the elderly.
• Discuss employment and income issues as they affect the elderly.
• Analyze the various statutes that have been enacted to assist the elderly with housing problems.
• Discuss the concept of guardianship.
• Identify effective estate planning.
• Analyze the concept of elder abuse and apply remedies for abuse.
• Discuss the agencies that provide assistance to the elderly.
• Discuss relevant ethical issues.
• Apply relevant modern technologies.

Prereq. ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours

(POL) Political Science

POL 100 American Government


Upon successful completion of this course, students should be able to:

• Perform the basic citizenship skills necessary to fulfill their role as an American citizen.
• Describe those principles of government essential to our constitutional system.
• Explain the constitutional functions of American federalism.
• Describe the basic functions of government performed by the major institutions of the American national government.
• Explain the major functions of state government institutions in our system.
• Explain the major purpose of political parties in our system of government.

3 Credits 3 Weekly Lecture Hours

POL 110 Introduction to Political Science

This course explores the fundamental concepts in the discipline of political science and the philosophical foundation of the American system of government.

Upon successful completion of this course, students should be able to:

• Distinguish between political philosophy and political science.
• State and explain the basic issues confronting man as a political animal.
• State and define the essential concepts in the discipline of political science.
• Demonstrate an understanding of the philosophical foundations of the American system of government.

3 Credits 3 Weekly Lecture Hours

POL 120 American National Government

This course is designed to encourage, enhance and heighten the student’s enlightened participation in our democratic society.

Upon successful completion of this course, students should be able to:

• Analyze the nature and roots of their role as an American citizen.
• Enumerate those principles of government considered essential to our constitutional system.
• Explain the constitutional basis of American federalism.
• Understand the fundamental concepts, functions and process of politics and the institutions of our national government.

3 Credits 3 Weekly Lecture Hours

POL 130 American State and Local Government

An analytical study of the powers, process and problems of American state, county and local governments. Careful consideration of the nature of political, legislative, administrative and judicial organization at the state, county and city level will be given.

Upon successful completion of the course, students should be able to:

• List the development of the six major historical periods in the evolution of American state and local government.
• Define federalism and two other major forms of governmental structure. Identify the nature, functions, structure and legal position of local government in American federalism.
• Trace the structure, functions and problems of the three branches of American state government with emphasis on Pennsylvania.

3 Credits 3 Weekly Lecture Hours

POL 140 American Presidency

This course is a study and analysis of the historical and political influences upon the institution of the modern American presidency.

Upon successful completion of this course, students should be able to:

• Explain the forces and participants involved in the dynamics of the compromise of the Constitutional Convention, which shaped the establishment of an executive branch.
• Identify the constitutional model and proper role of the president in the doctrine of separation of power.
• Discuss the constitutional powers of the president that overlap within the other two branches. Include some relevant and modern issues that are sources of controversy regarding their administration.
• Trace the historical evolution of the president within the confines of the constitutional and non-constitutional functions of the office.
• Critique the present method of nominating presidential candidates and election of the chief executive.
• Identify those presidents who have made the most permanent contributions to the evolution of the office.
• Explain the impact of television, campaign financing and the expectations of the American people toward the office of president.

3 Credits 3 Weekly Lecture Hours

POL 199 Co-op/Internship

Refer to Cooperative Education and Internship description in the “Options for Engaging College Credit” section of the catalog.

3 Credits 3 Weekly Lecture Hours

POL 200 World Affairs

This course deals with the theory and practice of international relations.

Upon successful completion of the course, students should be able to:

• Identify the principle characteristics of national states.
• Analyze the role of power in international politics.
• Identify the major constraints a national state must deal with in the formulation and implementation of foreign policy.
• Evaluate the relations between East and West in the post-World War II era.
• Assess the impact of the United Nations on the relations between national states in the contemporary world.
• Model appropriate strategies to acquire various methods for gathering information for the development, comprehension and practical application of said information in the deciphering of issues involved in world politics.
• Relate the foundations of instruction to the practice of reading and interpreting texts at the secondary level.
• Plan developmentally and culturally appropriate strategies to address individual differences among political adversaries.
• Enrich interdisciplinary activities by incorporating innovative technology and multimedia activities.
• Teach questioning and communication skills as an integral part of cultural development.

3 Credits 3 Weekly Lecture Hours

POL 210 Principles of Public Administration

The general principles and theories of administration are analyzed and related to the management of public business.

Upon successful completion of this course, students should be able to:

• Evaluate the trends and philosophies of bureaucracy in the public and private sectors.
• Analyze the role of the public administrator to the various branches and levels of government and to the general public.
• Describe the roles of the public administrator in terms of goal setting, organizational and personnel procedures, and financial management.

3 Credits 3 Weekly Lecture Hours

POL 230 African American Politics - Special Studies

This course is designed to encourage, enhance and heighten awareness of participation in our democratic society. African-American Politics introduces students to the concepts, functions, and structures of the United States government and the role of African-Americans within it. An analysis of the U.S. national political system with a focus on the contributions made by individuals of African descent in shaping the governmental process will be made. The nature of interactions that take place between the various branches and levels of government and African Americans will be addressed.

Upon successful completion of the course, students should be able to:

• Analyze the nature and roots of the role of African-American citizens.
• Enumerate those principles of government considered essential to our constitutional system and how they were implemented in regards to African-Americans.
• Explain the constitutional basis of American federalism and the contradiction of slavery and second-class citizenship.
• Understand the fundamental concepts, functions and process of politics and institutions of our national government that impact present political behavior.

Prereq. ENG 050 and REA 050

3 Credits 3 Weekly Lecture Hours
PSY 130  Personal and Career Development
This course gives students the opportunity to examine the relationship between personality traits, interests, skills and values, and appropriate life choices.
Upon successful completion of this course, students should be able to:
• Identify personal strengths and weaknesses.
• Depict the requisite skills of the major employment clusters.
• Make career decisions appropriate to the student’s own current development.
• Employ appropriate techniques in effecting career decisions.
Coreq. ENG 050 andREA 050 or pass test
3 Credits 3 Weekly Lecture Hours

PSY 140  General Psychology
This course is a one-semester introduction to the basic principles and major theoretical approaches that are used to explain human behavior, with emphasis on understanding and application of such principles and theories as they relate to ourselves and our surroundings.
Upon successful completion of this course, students should be able to:
• Explain the nature of psychology and describe the methods used by psychologists to study behavior.
• Identify the major physiological structures involved in the study of behavior.
• Identify the principles of sensation and perception describing illustrative phenomena.
• Describe current theories of learning and thinking explaining their influence in education, life-span development and other life situations.
• Describe the major trends in explaining human emotion and motivation and how they are assessed.
• Identify the major theories of human personality and development.
• Evaluate the impact of major trends in analyzing ourselves, interpersonal and social relationships, and the origins, classification and treatment of mental disorders.
• Explain the relationship among physiology, perception, learning, cognition, motivation and personality, applying them to understanding life situations.
Prereq. ENG 050 andREA 050
3 Credits 3 Weekly Lecture Hours

PSY 149  Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

PSY 200  Personality Theories
Emphasis in this course is on the understanding and application of basic concepts of psychodynamic, behavioral, cognitive and social cognitive, and humanistic-existential perspectives to personal and interpersonal functioning. Upon successful completion of the course, students should be able to:
• Detail the characteristics of psychoanalytic theory. List and describe the characteristics of behaviorist and social learning theories. Describe the characteristics of humanistic psychology. Identify the characteristics of cognitive theories of personality. Explain how an eclectic blend of several major personality theories can be applied to common life situations and experiences.
Prereq. PSY 140
3 Credits 3 Weekly Lecture Hours

PSY 202  Theories of Counseling
This course is a one-semester introduction to the basic theoretical approaches used in counseling.
Upon successful completion of this course, students should be able to:
• Describe relevant counseling theories
• Understand various ethical issues in the practice of counseling
• Describe the terminology associated with various theories
• Identify the major contributors associated with various theories
• Explain the assumptions of each theory
• Understand the goals of each theory
• Identify the roles of the therapist and the client within each theory
• Explain the process of therapy for each theory
• Identify the various techniques associated with each theory
• Evaluate the strengths and limitations of each theory
• Describe the characteristics of a multiculturally competent counselor
• Prerequisites/Co-requirements: English Composition I (ENG 100); General Psychology (PSY 140).
Prereq. PSY 140, ENG 100
3 Credits 3 Weekly Lecture Hours

PSY 203  Counseling Skills
• Special Studies
This experiential course is a one-semester introduction to the basic skills used in interviewing and counseling adults. Designed for the emerging human services paraprofessional, the focus is on developing the core skills necessary to facilitate effective helping relationships. This course includes both didactic instruction and the development of basic techniques through applied counseling lab activities.
Upon successful completion of this course, students should be able:
• Evaluate the differences and similarities among interviewing, counseling and psychotherapy.
• Explain the characteristics of a multiculturally competent counselor.
• Describe core ethical principles in interviewing and counseling.
• Identify the elements of an informed consent form.
• Demonstrate effective verbal and nonverbal attending behavior.
• Evaluate the effectiveness of open and closed questions.
• Demonstrate the foundational active listening skills of encouraging, paraphrasing, and summarizing.
• Demonstrate reflection of feelings skills.
• Demonstrate basic confrontation and challenging skills.
• Demonstrate reflection of meaning skills.
• Explain the concept of immediacy in a counseling relationship.
• Evaluate the influencing skills of self-disclosure and feedback.
• Describe the goal setting and action stages of counseling.
• Explain how basic counseling skills and concepts fit with various theoretical models of psychotherapy.
• Describe the importance of advocacy, community awareness and social change in counseling.
• Conduct an interview using only listening skills.
Prereq. PSY 140
3 Credits 3 Weekly Lecture Hours

PSY 110  Introduction to Human Services
This course is a one semester introduction to human services and the major policies and practices that are used to understand human strengths and challenges. The course explores the skills, values and knowledge base needed to effectively work as a culturally competent human service professional in a multidisciplinary setting.
Upon successful completion of this course, students should be able to:
• Explain the historical foundation and current role of the Human Service Worker.
• Describe the structure and content of a professional helping relationship.
• Identify interventions based on the major case management and counseling models in the field of human services.
• Demonstrate the skills necessary for interviewing individuals in a social service or agency setting.
• Understand the limitations of implementing services in social service systems.
• Explain the impact of the shift of responsibility for social welfare programs from the federal, to the state, to the local government, in the United States.
• Demonstrate how knowledge of oppression, privilege, culture, racism, institutional racism, stereotypes, discrimination, and ethnic identity to the skills necessary to perform the tasks of a culturally competent human service worker.
• Plan and design an intervention program targeted to a specific population’s need for group services.
• Evaluate the ethical dilemmas surrounding the concepts of self-determination, mandated treatment, HIV/AIDS, child abuse, the right to die and class differences between the worker and the client.
• Identify the emotional and physical symptoms and causes of professional burnout along with the methods designed to prevent it.
• Prerequisites/Co-Requirements: Satisfactory Score on the English and Reading placement tests or successful completion of ENG 050 (Developmental English) andREA 050 (Developmental Reading and Study Skills)
Prereq. ENG 050,REA 050 or pass test
3 Credits 3 Weekly Lecture Hours

PSY 120  Achievement Motivation
A systematic approach that allows students to experience and learn what achievement motivation is and how to use it to increase personal effectiveness. Games, simulated life experiences and a programmed text are used to create the opportunity to learn more about themselves and to experience how the sharing of human resources allows for personal growth.
Upon successful completion of this course, students should be able to:
• Evaluate at least one example of each of the four action strategies presented in McClelland’s theory.
• Identify all of the 10 thoughts and feelings presented in McClelland’s theory.
• Identify their motives in at least one course simulation exercise and one future goal.
• Identify some of their risk-taking patterns, personal goals, feelings, values and basic motives.
Prereq. ENG 050 andREA 050
3 Credits 3 Weekly Lecture Hours

PSY 199  Personal and Social Development
This course is intended for students with an interest in human services. It examines the current social problems and issues facing human services workers in today’s society. This course is designed to give students the basic skills used in interviewing and counseling adults.
Upon successful completion of the course, students should be able to:
• Identify the roles of the therapist and the client within each theory
• Understand the goals of each theory
• Identify the roles of the therapist and the client within each theory
• Explain the process of therapy for each theory
• Identify the various techniques associated with each theory
• Evaluate the strengths and limitations of each theory
• Describe the characteristics of a multiculturally competent counselor
• Prerequisites/Co-requirements: English Composition I (ENG 100); General Psychology (PSY 140).
Prereq. PSY 140, ENG 100
3 Credits 3 Weekly Lecture Hours
PSY 204 Foundations of Addictions - Special Studies
The main goal of this course is for students to develop knowledge of the nature and complexity of addiction. We will also look at theories involving Addiction from biological, social, and psychological perspectives. This course examines how the thoughts, feelings and behavior of an individual is influenced by the actual, imagined or implied presence of others with the goal of understanding social reality.
Upon successful completion of this course, students should be able to:
- Demonstrate an understanding of theoretical foundations of addiction.
- Describe societal issues associated with addictions/dependency.
- Understand the distribution of psychological perspectives to addiction.
- Explain the techniques involved in treatment of addiction.
- Identify programs that provide prevention services as well as those who provide rehabilitation programs and support services.
- Develop a working knowledge of 12-Step Programs and their benefits to addicted persons and their families/friends.
- Realize the consequences of addiction on family members and friends (Co-dependency, enabling, interventions)
- Understand the relationship between HIV/AIDS and Substance Abuse.
- Define the term Dual-Diagnosed and provide examples demonstrating this.
- Identify Legal and Ethical Standards involved in working with substance abuse clients.
- Explain the methods of drug testing and its impact on society.
- Describe the similarities and differences involving addictions to legal substances (tobacco, alcohol, food, prescribed medications) vs. illegal substances (cocaaine, heroin).
- Define populations where addictions are highly prevalent and determine risk factors which may be contributing to this.

Upon successful completion of this course, students should be able to:
- List the major advantages and disadvantages of persons with addiction.
- Cite the components of the authoritarian personality and its relevance to the study of child development.
- Evaluate the positive and negative dimensions of your own cultural experience. Identify personal values that promote understanding and cooperation among human beings.
- Discuss how culture and gender shape our personal identities and behaviors.

Prereq. PSY 140 or SOC 110
3 Credits 3 Weekly Lecture Hours

PSY 210 Lifespan Human Development
This course is a one-semester elective in which the major processes of human development from birth to death are described and explained.
Upon successful completion of this course, students should be able to:
- Identify and evaluate the basic universal principles underlying human development.
- Identify and describe the major physical and psychological characteristics of prenatal development, infancy, childhood, adolescence, maturity and aging.
- Describe, evaluate and compare the various theoretical approaches to cognitive, emotional, language, personality and social development throughout the life span.

Upon successful completion of this course, students should be able to:
- Define organizational behavior, list the key elements and understand why it is important to understand the psychological principles affecting the workplace.
- Understand and explain a motivational theory that pertains to industrial and organizational psychology.
- Understand the nature of organizational communications, including the factors that influence decision making.
- Understand the nature of leadership and be able to list at least three leadership skills.
- Explain "social environment" conformity.
- Understand the power of rumor and how it might be controlled.
- Explain the concept of industrial participation by employees including: (1) process, (2) prerequisites, (3) benefits, (4) types, and (5) limitations.
- Be familiar with the social problems and ethical issues that cause stress and distress in the workplace.
- Know the various responsibilities incumbent upon worker and employer regarding referral and treatment of social problems in industry.
- Understand the nature of “change” in the workplace.

Prereq. PSY 140
3 Credits 3 Weekly Lecture Hours

PSY 220 Abnormal Psychology
The nature of abnormal behavior, its etiology and classification together with a brief examination of treatment methods are emphasized. Psychoanalytic, behavioral, cognitive and sociocultural perspectives on psychopathology are examined within a biopsychosocial framework.
Upon successful completion of this course, students should be able to:
- Define learning.
- Identify key concepts in the behavioral theories of learning.
- Delineate important elements of observational learning and relate them to the teacher as a behavioral model.
- Describe three models of cognitive learning theory, identifying the key elements of each model.
- Contrast intrinsic and extrinsic motivation.
- Describe the role of self-efficacy in achievement motivation.
- Contrast the behavioral, humanistic, cognitive and social learning approaches to motivation.

PSY 221 Social Psychology
This course examines how the thoughts, feelings and behavior of an individual are influenced by the actual, imagined or implied presence of others with the goal of understanding social reality.
Upon successful completion of this course, students should be able to:
- Explain five major socio-psychological theories.
- Delineate the major methods of studying human behavior.
- Analyze and explain sex-role behavior.
- Depict the impact of violence on the individual, the group and our society.
- Assess the significance of attitudes on perception, moral judgment, prejudice and prosocial behavior.
- Cite the components of the authoritarian personality and its threat to individual human freedom.
- List the major advantages and disadvantages of persons and task-oriented leadership in groups and organizations.

Prereq. PSY 140 or SOC 110
3 Credits 3 Weekly Lecture Hours

PSY 225 Experiences in Diversity
This course critically examines societal and personal attitudes, values and norms regarding diversity. Topics include: race, ethnicity, gender and sexual preference. We will examine how these factors influence our perception of self and others.
Upon successful completion of the course, students should be able to: Demonstrate critical thinking on issues of race, gender, ethnicity and sexual orientation.
- Describe the impact of minority and majority status as it pertains to economic, psychological and social experience.
- Describe the etiology of racism, sexism, ethnocentrism and homophobia.
- List some of the contradictions of our multicultural society and different strategies toward resolving them.
- Evaluate the positive and negative dimensions of your own cultural experience. Identify personal values that promote understanding and cooperation among human beings.
- Discuss how culture and gender shape our personal identities and behaviors.

Prereq. SOC 110 or PSY 140
3 Credits 3 Weekly Lecture Hours
PSY 290  Adulthood and Aging
This course is an examination of the physical, psychological, cognitive, social and cultural changes that occur as people move from adulthood into old age. It explores the controversies, myths, realities, similarities and differences in growing older today in America as well as in other cultures around the world. Upon successful completion of this course, students should be able to:
1. Identify the basic principles underlying development from the adult years through the end of life.
2. Identify the major physical and psychological characteristics of adult development from adulthood to old age.
3. Evaluate the various theoretical approaches to cognitive, emotional, social and personality development in adult development through old age.
4. Evaluate the relevance of cross-cultural research findings in adult development and aging.

RAD 100  Introduction to Radiation Therapy
This is an introductory course designed to provide students with an overview of the fundamentals of radiation therapy and the radiation therapist’s role in the health care delivery system. Principles, practices, and policies of the educational program, health care systems, principles of radiation and health safety and professional responsibilities of the radiation therapist will be discussed and examined.

Upon successful completion of this course, students should be able to:
1. Discuss the policies and procedures of the program and clinical education settings as well as identify the responsibilities of the radiation therapy student.
2. Define cancer management principles and key terms in radiation therapy and identify pertinent library/internet resources pertinent to radiation therapy.
3. Discuss the responsibility of a patient, staff and facility confidentiality and identity contents/sections of patient’s records.
4. Discuss and identify the relationship of other health science professions and health care providers that participate in the patient’s total healthcare as well as the philosophy/misson of health care systems and educational programs.
5. Explain radiation and health safety procedures for radiation therapy, personnel and patients.
6. Differentiate and explain the difference between regulatory, educational, international, national, state and local organizations.
7. Discuss the radiation therapist Scope of Practice, Practice Standards and Code of Ethics, career advancement and opportunities for radiation therapists and benefits for continuing education.

RAD 105 Clinical Education I
Clinical Education I is the first part of four clinical education experiences for radiation therapy students. Clinical education incorporates the classroom components into an applied format.

Upon successful completion of this course, students should be able to:
1. Practice appropriate patient care and communication at all times and maintain patient modesty.
2. With assistance, operate all modes and functions of the treatment machine and console and accurately set up patients with the proper parameters.
3. With assistance, demonstrate familiarity with the treatment chart and accurately record data.
4. Observe and assist in all treatment procedures taking place in your assigned area.
5. With assistance, take weekly port films, review the port films and submit them for physician approval.

RAD 110 Radiation Therapy Techniques & Applications
This course is designed to provide an overview of cancer and the specialty of radiation therapy. The medical, biological, and pathological aspects as well as the physical and technical aspects will be discussed. Also, epidemiology, etiology, detection, diagnosis, patient condition, treatment and prognosis of neoplastic disease will be addressed. The radiation therapist’s role in treatment delivery will also be discussed.

Upon successful completion of this course, students should be able to:
1. Discuss tumor histology and site, clinical presentation, epidemiologic and etiologic information in relation to each specific neoplastic disease and treatment methods.
2. Describe historical treatment methods in radiation therapy as well as the role of surgery, radiation and medical oncology and current treatment methods in the management of neoplastic disease.
3. Discuss factors taken into consideration prior to radiation treatment.
4. Explain detection, diagnosis, grading and staging systems for each neoplastic site.
5. Implement the principles and practice of simulation to prepare a patient for treatment.

RAD 115 Oncologic Patient Care & Ethical/Legal Issues
This course is designed to provide the student with foundational competencies in assessment and evaluation of the patient for service delivery of the cancer patient. Psychological and physical needs and factors affecting treatment outcome will be presented and examined. Routine and emergency care procedures will be presented. Upon successful completion of this course, students should be able to:
1. Apply the Radiation Therapist Scope of Practice & Code of Ethics to clinical practice, differentiate the roles and responsibilities of the health care team and demonstrate applications of professional self care.
2. Explain the Patient’s Care Partnership, provide appropriate patient education materials for medical procedures, nutrition and assessment needs.
3. Explain the dynamics of communicating with the cancer patient and family, and to be able to answer questions as well as identify factors that influence emotional responses as well as psychological aspects of dying.
4. Assess the condition of the patient before, during and after treatment and procedures.
5. Demonstrate principles of health and radiation safety and what to do in the event of an emergency.
6. Define principles of medication, conventional and alternative medicine, ability to recognize common medications for their actions, side effects and adverse reactions.
7. Recognize radiation side effects and complications and be able to use proper body mechanics with all patients.
8. Define and discuss ethical and legal issues in radiation therapy.

RAD 120 Pathology
This course is designed to give students an overview of general pathology. General pathology introduces basic disease concepts, theories of disease causation and system-by-system pathophysiological disorders most frequently encountered in clinical practice.

Upon successful completion of this course, students should be able to:
1. Define and describe terminology and general principles used in the study of disease including neoplasms.
2. Differentiate and describe types of cellular and tissue injury, physiological response and healing.
3. Describe fluid and electrolyte balance disorders.
4. Identify the relationship between morphologic and functional changes to the origins of signs and symptoms and to their clinical significance.
5. Describe the common etiology, signs and symptoms, diagnostic tests, typical course and management of the common diseases and disorders of body systems and the effects of aging on those body systems.
6. Identify etiologic and epidemiological influences in the identification, prevention and treatment of common diseases and pathophysiological disorders.
7. Define the role of genetics and nutrition in pathophysiological disorders.

RAD 125 Radiobiology and Safety
This course is designed to present basic concepts and principles of radiobiology and radiation safety. Radiation interactions, theories and principles will be addressed. Radiation health and safety requirements of regulatory and accrediting agencies will also be addressed. Specific responsibilities of the radiation therapist are discussed as well.

Upon successful completion of this course, students should be able to:
1. Differentiate and distinguish between radiation exposure effects, dose equivalence, absorbed dose and radioactivity.
2. Define and discuss radiation principles, responsibilities of radiation personnel and use of proper terminology in relation to radiation protection.
3. Explain procedures to ship and receive radioactive materials, record keeping systems, and explanation of radiation detection devices.
4. Determine the difference between state and national regulatory agencies, and define methods of personnel monitoring and exposure limits for occupational and non-occupational individuals.
5. Calculate exposure doses and be able to develop an emergency plan for equipment failure.
6. Integrate laws, principles and theories of radiobiology into the clinical practice of radiation therapy.
7. Describe factors, events and effects of radiation exposure.
8. Demonstrate understanding of the concepts and clinically significant factors of radiation.
9. Describe the interactions, responses and syndromes related to radiation exposure.

PREREQUISITE: Acceptance into the Radiation Therapy Program
RAD 140  Radiation Therapy Treatment Planning

This course is designed to establish factors that influence and govern clinical planning of patient treatment. Encompassed are isodose descriptions, patient contouring, radiobiologic considerations, dosimetric calculations, compensation and clinical application of treatment beams.

Upon successful completion of this course, students should be able to:
- Define and describe the characteristics of a radiation beam, factors that effect it, and beam geometry
- Define and describe the various methods of treatment delivery and what considerations are necessary
- Demonstrate the ability to perform various mathematical calculations pertinent to radiation therapy
- Define and describe the various types of treatment techniques and equipment associated with radiation therapy delivery
- Define and describe the various aspects of radiation therapy dosimetry

3 Credits 3 Weekly Lecture Hours

RAD 145 Oncologic Pathology

This course will provide students with an in-depth study of new and abnormal development of cells. The processes involved in the development and classification of both benign and malignant tumors and site-specific information on malignant tumors is presented as well.

Upon successful completion of this course, students should be able to:
- Define terminology related to neoplasia and neoplasms
- Describe the microscopic features and effects of malignant and benign neoplasms
- Differentiate the processes involved in pathogenesis and carcinogenesis and the genetic/epigenetic theories of cancer
- Describe tumor classification based on histology and tumor characteristics and methods of diagnosis such as microscopy, chemical, radioactive isotopes and diagnostic tests
- Define the principles of staging and grading, prognostic factors and methods of spread in relation to cancer
- Identify and compare characteristics of site specific tumors and methods of treatment
- Identify the impact of other pathophysiologic disorders on the response of patients to radiation therapy treatment

3 Credits 3 Weekly Lecture Hours

RAD 150 Clinical Education II

Clinical Education II is the second phase of the Radiation Therapy students' clinical experience. Clinical education incorporates the classroom components into an applied format. During this second clinical education experience students should demonstrate the ability to operate radiation therapy equipment with minimal assistance, apply key fundamentals of treatment to their clinical experience, learn simulation techniques and interact and care for cancer patients effectively and compassionately.

Upon successful completion of this course, students should be able to:
- Define what CQI is and the tools and principles for specific situations and the difference from QA.
- Define human resources’ role in the work environment.
- Determine the importance of the need of organizational and departmental accreditation (i.e., radiation therapy facilities)
- Demonstrate understanding of financial decisions, CPT codes, and the various types of insurance necessary to radiation therapy clinics.
- Define managed care and components/methods of developing and managing a budget.
- Gain knowledge from practice exams to prepare students for the ARRT certification exam.

4 Credits

RAD 220 Seminar I-CQI & Board Review

This course will be divided into two parts: Continuous Quality Improvement and Board Exam Review. Continuous Quality Improvement is the continuous study and improvement of the health care services to meet the needs of patients and others. Continuous Quality Improvement includes CQI project development, evaluation, and assessment techniques. Human resource issues, accrediting agencies, and the radiation therapist’s role in that process will also be addressed. Billing and reimbursement issues pertinent to radiation therapy will also be presented. Board Exam Review will include mock exams that address similar questions that students will be confronted with once they take the certification exam. Material covered will be radiation protection and quality assurance, clinical concepts in radiation oncology, treatment planning and delivery, and patient care and education.

Upon successful completion of this course, students should be able to:
- Practice appropriate patient care and communication at all times and maintain patient modesty during procedures.
- Set up simple and intermediate simulation fields using the correct parameters, accessories, and alignment devices.
- With assistance set up complex treatment fields using correct parameters, accessories, and alignment devices.

4 Credits

RAD 230 Seminar II-Board Review

This course is the follow up to Seminar I. This course is designed to prepare students for the ARRT certification exam. Students will take mock exams that will include: radiation protection and quality assurance, clinical concepts in radiation oncology, treatment planning and delivery, patient care and education.

Upon successful completion of this course, students should be able to:
- Gain knowledge from the mock exams to assist in preparation for the ARRT certification exam.

1 Credit
REA 030 Basic and Essential Reading

This course is designed for students who must strengthen comprehension, vocabulary, and study skills. Students will start by focusing on establishing and developing word recognition skills and improving vocabulary so that they may learn to comprehend material at the appropriate level and will progress to strategically reading paragraphs and passages.

Upon successful completion of the course, students should be able to:

- Use common prefixes, suffixes, and roots to determine the meaning of an unknown word.
- Pronounce vowel sounds, consonant blends, and vowel combinations correctly.
- Use basic rules to syllabicate unknown words.
- Use context clues and structural analysis as aids in determining the meaning of unknown words.
- Use the dictionary.
- Follow written and oral directions.
- Recognize the topic and topic sentence of short paragraphs.
- Locate and explain topic sentences and supporting details in paragraphs.
- Recognize basic paragraph patterns.
- Outline a paragraph.
- Use the steps of a study technique.
- Use the library effectively to complete a given assignment.

Prerequisites: Reading placement test. For some students depending on their writing placement, ENG 025 or ESL 035 may also be required.

Credits not applicable to a degree.

3 Credits 3 Weekly Lecture Hours

REA 050 Developmental Reading and Study Skills

Developmental Reading is designed for students who need to improve their ability to understand and retain the material they read in college-level texts. Emphasis is on comprehension skills, reading strategies, and vocabulary development.

Upon successful completion of this course, students should be able to:

- Use strategies to develop vocabulary.
- State the topics and main ideas, both implied and stated, of a variety of reading materials.
- Identify and use language and structural clues as an aid to comprehension in reading materials.
- Use study skills formula as an aid to academic success.
- Identify and use reading strategies to resolve difficulties in comprehension.
- Use prior knowledge as a connection to reading material.
- Make and support inferences and conclusions by locating contextual hints and clues.
- Use the library effectively to complete specific assignments.
- Use paraphrasing to effectively summarize reading materials

Prerequisite: Satisfactory score on the reading placement test, ENG 025, REA 030, or ESL 025 or ESL 045

3 Credits 3 Weekly Lecture Hours

REA 050C Jump Start Reading - Special Studies

3 Credits 3 Weekly Lecture Hours

REA 100 Critical Reading

This is an advanced reading course for students who are reading at or above the college level. It is designed to develop the student’s thinking, reasoning and problem-solving skills.

Upon successful completion of the course, students should be able to apply critical and efficient reading and interventional thinking skills to college texts and personal reading by:

- Recognizing facts, opinions, judgments, intent, attitude and tone in reading material.
- Making and supporting inferences and conclusions by locating contextual hints and clues.
- Integrating related material from several different sources.
- Evaluating persuasive techniques used in advertisements, magazine articles and editorials.
- Recognizing and evaluating techniques used in argumentation and propaganda.
- Demonstrating skill in writing summaries.
- Reading efficiently and varying pace to suit both need and material.
- Developing interpretive skills when reading selected poems, short stories, essays, and newspapers.

Prerequisite: REA 050. REA 100 may be used for open elective requirement.

3 Credits 3 Weekly Lecture Hours

(RTH) Respiratory Therapy

RTH 100 Respiratory Therapy Principles I

This course provides the foundation in science required to apply the principles of respiratory care. The course begins with the study of the physics principles essential to respiratory care. An in-depth study of the anatomy and physiology of the cardiopulmonary system follow this. Finally, additional topics related to the proactive of respiratory care are presented.

Upon successful completion of this course, students should be able to:

- Discuss the principles of physics as related to respiratory care.
- Discuss the cardiopulmonary anatomy and physiology.
- Describe acid-base physiology and compensatory mechanisms.
- Discuss the concepts of team approach and patient-therapist interaction.
- Recall the history and purpose of respiratory therapy.
- Discuss legal and ethical concepts basic to respiratory therapy.
- Describe the principles and theory of arterial and veni-puncture.
- Describe the principles of cardiopulmonary resuscitation.
- Communicate using medical terminology.

4 Credits 4 Weekly Lecture Hours

RTH 101 Respiratory Therapy Practicum I

This course reinforces the principles taught in RTH 100 utilizing the laboratory approach. Assignments applying the principles of physics and chemistry essential to respiratory care will be performed in the simulation lab. Models and computer simulation will be utilized when appropriate.

Upon successful completion of this course students should be able to:

- Apply the principles of physics in the clinical situation.
- Apply principles of pulmonary anatomy and physiology in the clinical situation.
- Apply his/her knowledge of acid-base physiology to the clinical setting.
- Apply principles of team approach and concepts of appropriate patient-therapist interaction to patient care.
- Perform arterial and veni-puncture.
- Perform cardiopulmonary resuscitation.

Coreq. RTH 100, BIO 117

4 Credits 12 Weekly Laboratory Hours

RTH 102 Respiratory Therapy Principles II

This course provides students with the information necessary to safely administer aerosolized respiratory drugs. The student will learn the method of action of the drugs used to treat respiratory diseases, and proper dosages and frequency of administration. The student will understand the indications for mechanical ventilation, as well as the monitoring of critically ill adult patients requiring ventilatory support. Complications involved in positive pressure ventilation will be reviewed. This course also covers the methods involved in removal of patients from mechanical ventilators.

Upon successful completion of this course, students should be able to:

- The student will have a basic knowledge of how drugs are administered.
- The student will be able to explain the mechanism of action for respiratory drugs.
- The student will be able to identify the basic functions of mechanical ventilators.
- The student will be able to describe why patients may require ventilatory support.
- Discuss the importance of monitoring patients requiring ventilatory support.
- Describe when and how to successfully wean a patient from mechanical ventilation.

Coreq. RTH 101, BIO 117

2 Credits 2 Weekly Lecture Hours

RTH 103 Respiratory Therapy Practicum II

This course provides students with the knowledge and motor skills necessary to deliver oxygen therapy, bronchopulmonary hygiene, airway management and ventilator management to the adult patient.

Upon successful completion of this course, students should be able to:

- Recommend respiratory care based on evaluation of a patient’s medical history, physical examination and diagnostic studies.
- Perform cardiopulmonary resuscitation according to the protocols of the American Heart Association.
- Ensure the safety of patients and staff by adhering to infection control standards.
- Deliver bronchopulmonary hygiene therapies and modify according to the patient’s response.
- Maintain a patent airway.
- Deliver medical gas therapy and modify the treatment according to the patient’s response.
- Manage ventilation of adult patients in the simulation laboratory.

Prereq. RTH 100, RTH 101, BIO 117

6 Credits 12 Weekly Laboratory Hours

148 COURSE DESCRIPTIONS
RTH 104  Respiratory Therapy
Summer Clinical I
This course is a supervised clinical practice.
Upon successful completion of this course, students should be able to:
• Administer bronchopulmonary hygiene and modify therapy based on patient response.
• Analyze and ensure accurate results of various types of samples to determine cardiopulmonary function.
• Administer bronchopulmonary hygiene and ventilatory support to critically ill adult patients.
• Assist physicians with special procedure and communicate effectively with physicians.
Prereq. RTH 102 and RTH 103
5 Credits

RTH 105  Respiratory Therapy Summer Clinical II
This course is a supervised clinical practice.
Upon successful completion of this course, students should be able to:
• Administer bronchopulmonary hygiene and modify therapy based on patient response.
• Appreciate the role of anesthesia in the practice of respiratory care.
• Administer bronchopulmonary hygiene and ventilatory support to critically ill adult patients.
Prereq. RTH 102 and RTH 103
5 Credits

RTH 200  Respiratory Therapy Principles II
In this course students will study advanced topics in respiratory care including cardiovascular and renal physiology and the specialties of pulmonary function testing and pediatrics.
Upon successful completion of this course, students should be able to:
• Analyze tests of pulmonary function and modify therapies based upon results.
• Apply the principles of respiratory care, cognizant of the special physiologic and pathophysiologic processes of the neonatal and pediatric patient.
• Describe fundamental principles of normal renal physiology.
• Describe fundamental principles of normal cardiovascular physiology.
Prereq. RTH 201 Coreq. RTH 204
3 Credits 3 Weekly Lecture Hours

RTH 201  Respiratory Therapy Clinical Practicum III
This course is a supervised clinical practice.
Upon successful completion of this course, students should be able to:
• Administer bronchopulmonary hygiene, invasive and non-invasive ventilation and cardiopulmonary resuscitation in the Emergency Room setting.
• Perform pulmonary function testing and analyze results to ensure appropriateness of respiratory care.
• Administer bronchopulmonary hygiene and ventilatory support to critically ill adult patients.
• Assist physicians with patient assessment, special procedure and communicate effectively with physicians.
Prereq. RTH 105 Coreq. RTH 200, RTH 204
6 Credits 12 Weekly Laboratory Hours

RTH 202  Respiratory Therapy Principles IV
This course includes the study of advanced cardiovascular and renal physiology and pathophysiology, and treatment regimens that impact respiratory care.
Upon successful completion of this course, students should be able to:
• Discuss the basic principles of pharmacology, drug administration methods, drug action and side effects with emphasis on respiratory and cardiovascular systems.
• Discuss the principles of fluid and electrolyte balance and how it relates to the respiratory system.
• Describe the principles of cardiac and hemodynamic monitoring.
• Research and present a paper on an area or concept of respiratory therapy in the area of techniques equipment, or respiratory physiology.
Prereq. RTH 201 Coreq. RTH 203, RTH 205
4 Credits 3 Weekly Lecture Hours

RTH 203  Respiratory Therapy Practicum IV
This course is a supervised clinical practice.
Upon successful completion of this course, students should be able to:
• Administer bronchopulmonary hygiene and ventilator support to neonatal and pediatric patients.
• Perform respiratory care in the subacute setting.
• Administer bronchopulmonary hygiene and ventilatory support to critically ill adult patients.
• Perform and recommend cardiovascular diagnostic testing as appropriate to respiratory care.
Prereq. RTH 201, RTH 204 Coreq. RTH 202, RTH 205
6 Credits 12 Weekly Laboratory Hours

RTH 204  Pulmonary Pathophysiology Clinical Rounds I
This course is a supervised clinical study of pulmonary pathophysiology.
Upon successful completion of this course, students should be able to:
• Describe the etiology, pathology, functional abnormality, PFT results, pulmonary assessment data, clinical features, treatment and prognosis of the major diseases effecting the respiratory system.
Prereq. RTH 105 Coreq. RTH 200, RTH 201
2 Credits 4 Weekly Laboratory Hours

RTH 205  Pulmonary Pathophysiology Clinical Rounds II
This course is a supervised clinical study of pulmonary pathophysiology.
Upon successful completion of this course, students should be able to:
• Describe the etiology, pathology, functional abnormality, PFT results, pulmonary assessment data, clinical features, treatment and prognosis of the major diseases effecting the respiratory system.
Prereq. RTH 201, RTH 204 Coreq. RTH 202, RTH 203
2 Credits 4 Weekly Laboratory Hours

RTH 206  Respiratory Therapy Summer Clinical III
This course is a supervised clinical practice.
Upon successful completion of this course, students should be able to:
• Administer and evaluate the results of polysomnographic testing.
• Perform and recommend invasive cardiovascular diagnostic testing as appropriate to respiratory care.
• Administer bronchopulmonary hygiene and ventilatory support to critically ill adult patients.
Prereq. RTH 203, RTH 205
3 Credits 3 Weekly Lecture Hours

SCI 100  Man & Environment
A study of the design of the natural world and the impact of humans on the environment. It also includes a study of the environmental problems created by our technology. Topics include basic ecology, the population explosion, energy and pollution. Field trips may be included.
This course is an elective designed for non-science majors.
Upon satisfactory completion of this course, students should be able to:
• Analyze the design of the real world.
• Describe the dynamics of the population of different species excluding man in the biosphere.
• Interpret the dynamics of population and future implications if population growth remains unchecked.
• Analyze the energy alternatives to meet the demands of technology and growing population on the world's natural resources.
• Analyze adverse effects of modern societal values and priorities on the biosphere.
• Formulate applications of environmental concepts to one's interests through integration activities.
Prereq. REA 050 or Equiv.
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

SCI 105  Introduction to Nanotechnology
This course will cover the application of nanotechnology to electronic, chemical, and biological fields including a review of the basic science concepts. The impact of the commercialization of nanotechnology on society and the environment will be discussed. It is intended primarily for students in any of the various technology programs who will seek employment as laboratory technicians in research and industrial laboratories. Emphasis will be placed on providing a broad overview of the field.
Upon successful completion of this course, students should be able to:
• Demonstrate an understanding of scientific notation and size relationships between nanometers and larger metric measures.
• Describe the societal impacts of nanotechnology on modern society.
• List at least five biological applications of nanotechnology.
• Find, using Internet research, five commercial applications of nanotechnology.
• Describe the structures known as nanotubes and bucky balls, and one current application of each form.
• Describe the application of nanotechnology in environmental and medical sensors to electronic monitoring.
• Define key nanotechnology concepts such as “bottom-up”, “self-assembly”, and “molecular recognition”.
• Discuss instrumentation, such as SEM and STM, which is used at the nano level.
• Hypothesize future applications of nanotechnology.
Prereq. REA 050
3 Credits 3 Weekly Lecture Hours
SCI 110  History of Science
This course, designed as a non-laboratory science option for non-science majors or as an open elective for Natural Science majors, traces the philosophical, cultural, intellectual, and technological developments that influenced the evolution of modern science. By examining these developments made over a span of two millennia, students in the course identify the people, places, ideas, and discoveries that led to fundamental shifts in worldviews resulting in changes in the way people obtain knowledge about, investigate, and understand the physical world. Specifically, the course explores the origin and influence of scientific methodologies by tracing the changing role of experimenters, their experiments, and the tools they used. In addition, students document the converging influences that resulted in the Scientific Renaissance and the Scientific Revolution. The course concludes by highlighting important scientific discoveries up to the present day and the continuing struggle between science and long-held misconceptions and beliefs.

Upon successful completion of this course, students should be able to:
• Develop an answer to the question What is science?, state the basic assumptions underlying modern science, and discuss the origins of these assumptions
• Define scientific paradigm, describe its influence on the development of science, and outline the factors that result in a change of the scientific paradigm
• List the characteristics of a scientific methodology
• Understand the role politics, religion, and commerce played in the history of science
• Explain the difference between deductive and inductive arguments and their role in the study of the physical world, identity people who employed them, and give examples of each form
• Describe the approaches and contributions to science of Greek, Islamic, Chinese, Indian, and European thinkers and identify the people and places associated with these approaches and contributions
• Outline the changing role of experimentation in the history of science, the tools used in the experiments, and describe their influence on the origin of scientific methodology
• List examples and relate the significance of the people, places, ideas, and discoveries that were part of the Scientific Renaissance
• Describe the emergence of the Scientific Revolution from the Scientific Renaissance and provide examples of important scientific discoveries over the past three hundred years
• Identify current areas where scientific research is in conflict with popular beliefs and analyze a selected conflict by examining all arguments put forth in the context of the scientific method and the history of science

SOC 100  Introduction to Sociology
The factors that determine social organization, behavior and change are considered in relation to the individual student’s own life. Study is concentrated on social intervention, culture, social class, demography, collective behavior, institutions and socialization.

Upon successful completion of this course, the student should be able to:
• Apply the sociological perspective to their own lives
• Further personal development through knowledge and in the socialization process
• Describe the impact of the five major social institutions on society and themselves
• Assess present and possible future effects of social change on their culture’s and their own basic values
• Depict the effects of living in a modern complex society
• Use the three major sociological theoretical perspectives to analyze a major concept within sociology

SOC 101  Human Relations
This course is designed as an introduction to the basic principles of sociology with emphasis on human relationships in community and industrial settings.

Upon successful completion of this course, students should be able to:
• Explain the importance of human relations in the community and occupational spheres
• Interact effectively in the social context
• Describe the significance of self-awareness in building good human relationships
• Distinguish between the formal and informal structures of an organization as they relate to appropriate human relations
• Describe appropriate employee on-the-job behavior, especially during the first few probationary months
• Describe how the impact of human relations in the leadership and motivational areas can affect productivity

3 Credits 3 Weekly Lecture Hours

SOC 110  Introduction to Sociology
The factors that determine social organization, behavior and change are considered in relation to the individual student’s own life. Study is concentrated on social intervention, culture, social class, demography, collective behavior, institutions and socialization.

Upon successful completion of this course, the student should be able to:
• Apply the sociological perspective to their own lives
• Further personal development through knowledge and in the socialization process
• Describe the impact of the five major social institutions on society and themselves
• Assess present and possible future effects of social change on their culture’s and their own basic values
• Depict the effects of living in a modern complex society
• Use the three major sociological theoretical perspectives to analyze a major concept within sociology

SOC 111  Introduction to Human Services
This course is a one semester introduction to human services and the major policies and practices that are used to understand human strengths and challenges. The course explores the skills, values and knowledge base needed to effectively work as a culturally competent human service professional in a multidisciplinary setting.

Upon successful completion of this course, students should be able to:
• Explain the historical foundation and current role of the Human Service Worker
• Describe the structure and content of a professional helping relationship
• Identify interventions based on the major case management and counseling models in the field of human services
• Demonstrate the skills necessary for interviewing individuals in a social service or agency setting
• Understand the limitations of implementing services in social service systems
• Explain the impact of the shift of responsibility for social welfare programs from the federal, to the state, to the local government, in the United States
• Demonstrate how knowledge of oppression, privilege, culture, racism, institutional racism, stereotypes, discrimination, and ethnic identity to the skills necessary to perform the tasks of a culturally competent human service worker
• Plan and design an intervention program targeted to a specific population’s need for group services
• Evaluate the ethical dilemmas surrounding the concepts of self-determination, mandated treatment, HIV/AIDS, child abuse, the right to die and class differences between the worker and the client
• Identify the emotional and physical symptoms and causes of professional burnout along with the methods designed to prevent it

3 Credits 3 Weekly Lecture Hours

SOC 120  Social Problem
This course studies contemporary social problems from theoretical and practical perspectives. Field study brings students into contact with both public and private agencies and institutions. Special projects are required.

Upon successful completion of this course students should be able to:
• Apply the sociological perspective to the field of social problems
• Describe the origin, development, and society’s possible treatment of at least two contemporary and three traditional social problems

PreReq. ENG 050 and REA 050
3 Credits 3 Weekly Lecture Hours

SOC 130  The Elderly and the Criminal Justice System - Special Studies
This course is designed to study the agencies, processes and people involved in the criminal justice system as it focuses on problems with the elderly. Legislatures, law enforcement, prosecution, courts, corrections issues are studied with respect to the elderly. Emphasis will be made on the challenges faced by the criminal justice system, when dealing with issues associated with senior citizens. Particular attention will be dedicated to different international approaches to these issues in the study of gerontology.

Upon successful completion of this course, students should be able to:
• Explain the problems faced by the police in dealing with the Elderly as victims and as perpetrators
• Recognize the various methods of fraud perpetrated against Medicare and Medicaid
• Discuss the rising rate of elder abuse as it relates to the family, caretakers and nursing homes
• Understand the impact of the Criminal Justice process on the Elderly as eyewitnesses and Jurors
• Delineate the problem of sentencing elderly convicted offenders
• Outline the strategies used to handle elderly prisoners
• Discuss various international approaches to the relationship of the Elderly to the various criminal justice systems

PreReq. SOC 110 or SOC 111 or PSY 110
3 Credits 3 Weekly Lecture Hours

SOC 180  Sociology of Marriage and The Family
This course explores the various types of paired relationships in American society.

Upon successful completion of this course, students should be able to:
• Describe the American family in terms of the three major sociological theories
• Explain the concepts concerning who marries whom
• Explain human reproduction, including prenatal aspects, childbirth, contraceptive techniques and socially transmitted diseases
• Assess possible future changes, marriage forms and living arrangements as they may affect the American family

PreReq. ENG 050 and REA 050
3 Credits 3 Weekly Lecture Hours

SOC 199  Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.
SOC 202  Theories of Counseling
This course is a one-semester introduction to the basic theoretical approaches used in counseling.
Upon successful completion of this course, students should be able to:
• Describe relevant counseling theories
• Understand various ethical issues in the practice of counseling
• Describe the terminology associated with various theories
• Identify the major contributors associated with various theories
• Explain the assumptions of each theory
• Understand the goals of each theory
• Identify the roles of the therapist and the client within each theory
• Explain the process of therapy for each theory
• Identify the various techniques associated with each theory
• Evaluate the strengths and limitations of each theory
• Describe the characteristics of a multiculturally competent counselor.
Prerequisites/Co-requisites: English Composition I (ENG 100), General Psychology (PSY 140).
3 Credits 3 Weekly Lecture Hours

SOC 205  Victimology - Special Studies
This is a survey course covering contemporary developments in the field of victimology, its conceptual boundaries, its basic concepts and literature, its subfields and role as a field of study within criminology and criminal justice. The historical and emerging roles of victimology as a field are examined and discussed in depth. Special attention is paid to applied learning objectives with respect to each student's personal experiences with human dimensions of victimization. This course also deals with analysis of contemporary programs and trends in the criminal justice system's response to victims.
Upon successful completion of this course, students should be able to:
• To increase familiarity with basic terms, concepts and ideas in victimology.
• To appreciate the historical development of victimology and its subfields.
• To explore and analyze contemporary problems and trends in victimology.
• To review the functions, operations and management of the criminal justice system.
• Describe the basic components of the Criminal Justice System which pertain to victim assistance.
• Identify the liabilities of individuals who perpetrate criminal acts upon victims.
• Recognize the requirements of various Pennsylvania criminal statutes in protecting victims' rights.
• Identify the important role victims play in vindicating their own rights through victim impact statements.
Prerequisites/Co-requisites: Satisfactory scores on placement tests in English and Reading or successful completion of ADJ 101 or PSY 110 OR SOC 111.
3 Credits 3 Weekly Lecture Hours

SOC 210  Cultural Anthropology
The socio-humanistic facts of culture are viewed via a thematic cross-cultural approach. Evolution of community living from band to post-urban and its effects of individual behavior is explored.
Upon successful completion of this course, students should be able to:
• Apply the cultural anthropological perspective to his/her own life.
• Demonstrate usage of the fundamental principles involved in the study of culture to daily living.
• Explain various types of “world views” as found in different cultures.
• Describe the impact of the cultural environment upon the student's personality.
• Assess the effects of cultural change upon the student's own and his/her culture's fundamental values.
Prereq: SOC 110
3 Credits 3 Weekly Lecture Hours

SOC 215  Experiences in Diversity
This course critically examines societal and personal attitudes, values and norms regarding diversity. Topics include: race, ethnicity, gender and sexual preference. We will examine how these factors influence our perception of self and others.
Upon successful completion of the course, students should be able to:
• Demonstrate critical thinking on issues of race, gender, ethnicity and sexual orientation.
• Describe the impact of minority and majority status as it pertains to economic, psychological and social experience.
• Describe the etiology of racism, sexism, ethnocentrism and homophobia.
• List some of the contradictions of our multicultural society and different strategies toward resolving them.
• Evaluate the positive and negative dimensions of your own cultural experience. Identify personal values that promote understanding and cooperation among human beings.
• Discuss how culture and gender shape our personal identities and behaviors.
Prereq: PSY 140 or SOC 110
3 Credits 3 Weekly Lecture Hours

SOC 219  The Sociology of Race And Immigration - Special Studies
In this class we will examine the Eurocentric construction of race, delving into how it became a central organizing principle in North American society. We will also examine the when, the why, and the how of immigrant arrival in the USA, paying close attention to the manner in which various group experiences in the U.S.A were (and are) similar to, and different from, one another. This class will be both historical in nature and present-day oriented. That is, we will examine the when, why, and how of the development of racial categories, ideology, and racism. We will take the time to study the past because without such knowledge we can neither understand nor examine the current system of racial domination. This type of inquiry will help shed light on how historical circumstances continue to impact and shape current racialized identities and disparities today. In this class we will examine various racial and ethnic group experiences within the context of race-based theories. These theories attempt to provide explanations as to why (1) various racial groups were/are treated in specifically different ways (accorded privilege or penalization); (2) some racial groups were able to “make it” and others continue to be disproportionately disadvantaged; and (3) race continues to be a central organizing principle in American society. Furthermore, we will examine the “other” from the viewpoint of those marginalized in society. Therefore, we will explore the relationship between the dominant - hegemonic - culture, and subcultural beliefs, attitudes, challenges, and attempts to redefine group status. This means we will focus upon power relationships and the dynamics of group attempts to access power, and how these movements have shaped and transformed the American social fabric.
Upon successful completion of the course, students should be able to:
• Describe the social construction of racial and ethnic categories.
• Demonstrate critical thinking on issues of race and ethnicity.
• Demonstrate critical thinking on racial inequality.
• List the racial contradictions inherent in U.S. society, and different strategies toward resolving them.
• Describe various immigrant experiences in the U.S.
• Discuss and discuss theories of integration.
• Evaluate the positive and negative dimensions of your own cultural experience. Discuss and write about structural forces, which shape social activity.
• Present ideas clearly, briefly and in an engaging manner in a public setting. Speak in front of the class in a formal and professional manner.
Prereq: SOC 110, SOC 215 or PSY 225
3 Credits 3 Weekly Lecture Hours

SOC 220  Social Psychology
This course examines how the thoughts, feelings and behavior of an individual are influenced by the actual, imagined or implied presence of others with the goal of understanding social reality.
Upon successful completion of this course, students should be able to:
• Explain five major socio-psychological theories.
• Delineate the major methods of studying human behavior.
• Analyze and explain sex-role behavior.
• Depict the impact of violence on the individual, the group and the society.
• Assess the significance of attitudes on perception, moral judgment, prejudice and prosocial behavior.
• Cite the components of the authoritarian personality and its threat to individual human freedom.
• List the major advantages and disadvantages of persons and task-oriented leadership in groups and organizations.
Prereq: SOC 110 or PSY 140
3 Credits 3 Weekly Lecture Hours

SOC 240  Human Geography
This class will look at how places and regions are interconnected, how they are unique, and how people, ideas, and things moving from one locale to another can change a place or region. After taking this class, students will view their surroundings in new ways by asking questions like: Why are peoples, cultures, and places what they are? Why are they where they are? How can geography help me understand today’s changing world?
Upon successful completion of this course, students should be able to:
• Define and describe the role of geography as an academic discipline its relation to other subjects, and career possibilities.
• Explain the major course themes of globalization and cultural diversity, and how they relate to the various course topics.
• Describe the major concepts and principles concerning our human relationship to, and use of, the earth’s environment from an historical perspective.
• Describe the major concepts and principles concerning our human relationship to, and use of, the earth’s environment from an historical perspective.
• Describe the major geographical themes as applied to aspects of human culture such as language, music, religion, and social customs.
• Describe the major world agricultural systems.
• Describe the primary geographical aspects of economic development, the ways in which it varies, and the ways that countries can promote development.
3 Credits 3 Weekly Lecture Hours
SOC 260 Research Methods In the Social Sciences - Special Studies

This course is designed to give students the skills to examine social issues in America. You should be able to examine these problems utilizing the rigors of the social science research skills that you learn in this course and applying them to an issue in the society in which you live. In other words, develop the skills to examine public issues. We can accomplish this by discussing issues and applying the methodology taught in this course.

Upon successful completion of the course, students should be able to:

- Examine how social scientist gather and identify valid information.
- Describe and analyze research instruments.
- Describe the methods involved in doing social science research.
- Understand the different levels of measurement.
- Understand several types of probability and non-probability sampling.
- Understand the fundamentals of conducting and writing about social science research.

3 Credits 3 Weekly Lecture Hours

SPA 101 Elementary Spanish I

The basic principles of pronunciation and grammar of the Spanish language are covered and vocabulary dealing with everyday situations is emphasized. Listening and speaking skills are developed through laboratory practice and increased use of Spanish in the classroom.

Upon successful completion of this course, students should be able to:

- Recognize the essential differences between the Spanish and English pronunciation systems.
- Understand in oral and written form first-level content words and grammatical principles.
- Read aloud in Spanish with due attention to principles of good pronunciation including word stress and intonation patterns.
- Produce appropriate patterns and sentence transformation.
- Write in dictation form with a reasonable degree of accuracy from materials that have been studied.
- Recall facts and observations taken from selected readings on Hispanic and Latin American civilizations from reading assignments.

Fewer than two yrs H.S. Spanish

3 Credits 3 Weekly Lecture Hours

SPA 111 Intermediate Spanish I

Active review of Spanish pronunciation and of fundamental grammatical elements. Study and practice with new concepts of grammar and idiomatic language. Class discussion of selected cultural essays, news articles and/or literary excerpts. Laboratory practice is assigned for improving comprehension of Spanish spoken at normal conversation speeds.

Upon successful completion of this course, students should be able to:

- Speak the language in meaningful sentences and appropriate phrases that can be understood by the fluent speaker.
- Respond appropriately to questions on reading selections previously discussed.
- Recall vocabulary, grammatical structures and appropriate correspondence to idiomatic structures in Spanish writings.
- Take dictation from familiar texts.
- Recall important facts and observations taken from selected readings on Hispanic and Latin American civilizations previously studied.

Prereq. SPA 102

3 Credits 3 Weekly Lecture Hours

SPA 112 Intermediate Spanish II

Continued emphasis on active Spanish review of grammatical concepts and instruction in new principles. More attention is given to speaking and understanding the target language through variety of texts including essays and selected masterpieces in poetry and prose. Includes directed and free compositions to enhance writing skills. Laboratory practice is offered for better comprehension of spoken Spanish.

Upon successful completion of this course, students should be able to:

- Demonstrate increasing skill in communicating in Spanish.
- Respond appropriately to questions arising from dialogue, readings and situations previously illustrated.
- Read silently in Spanish, concentrating on the ideas expressed in writing.
- Write complete and meaningful paragraphs and short compositions incorporating newly learned grammatical principles.
- Write in dictation form from familiar texts.
- Recall a significant number of facts or observations derived from selected essays on the Hispanic heritage.

Prereq. SPA 111

3 Credits 3 Weekly Lecture Hours

SPA 102 Elementary Spanish II

This course stresses progress in the speaking, writing and reading skills begun in SPA 101 and promotes understanding of Hispanic culture. The mandatory use of laboratory tapes further develops listening and speaking skills.

Upon successful completion of this course, students should be able to:

- Respond in Spanish to a representative number of daily situations.
- Produce with more accuracy the phonetic sounds of the language.
- Read familiar prose aloud in a manner acceptable to the fluent speaker.
- Carry out familiar requests made in Spanish.
- Demonstrate increased command of vocabulary and elements of grammar.
- Briefly express ideas on a given topic.
- Recall familiar facts of Hispanic and Latin American civilizations from reading assignments.

Prereq. SPA 101 or two yrs H.S. Spanish

3 Credits 3 Weekly Lecture Hours

TCC 112 CADD Graphics

This course provides students with the concepts and skills necessary to form the basis of object visualization and documentation inherent to the creation and conveying of technical designs and drawings. Appropriate drafting concepts and skills are developed through use of both free-hand sketching and computer-assisted drafting. Instruction in the use of CADD systems is integrated with graphic theory throughout the course. The course covers theoretical and applied drafting concepts appropriate for conveying graphical representation of objects and designs in a variety of technical environments including manufacturing and construction, as well as architectural, mechanical and civil engineering design.

Upon successful completion of this course, students should be able to:

- Demonstrate the principles governing the setup and layout of technical drawings.
- Discuss the geometric terms and principles used to define, design and represent drawing objects and entities.
- Apply geometric construction techniques and principles of orthographic and pictorial projection for the representation of basic objects.
- Perform basic annotation operations.
- Apply acceptable forms of linework and text in both freehand sketching and CADD.
- Demonstrate the use of basic office equipment, including computer information systems, for creating, managing, plotting and reproducing technical drawings.

3 Credits 2 Weekly Lecture Hours

TCC 121 Project Management Processes

This course is a general survey of time/event and resource management principles. Time management, group dynamics, operations management and project management are covered. Project management can be applied to fields of engineering, architecture, construction, manufacturing, service occupations and others.

Upon successful completion of this course, students should be able to:

- Develop a process based rationale for approaching project management.
- Develop a process for defining project objectives and goals.
- Identify substantive data upon that decisions can be made in the process of managing a project.
- Ascertain the elements and methods essential for process/project management systems.
- Prepare schedule updates and conduct resource capacity analysis.
- Select the method of solution most appropriate for a particular problem.
- Utilize personal computer (PC)-based software programs to compile data, generate documentation, prepare graphical representation, perform analyses and conduct simulations.
- Perform network analyses.
• Make operational decisions in connection with a particular management system.
• Use exercises and case studies for examining project management problems, for developing solutions to problems and for service testing ideas, plans and methods.

Prereq. TCC 111
3 Credits 2 Weekly Lecture Hours

TCC 122 2-D CADD
This is a course in computer-aided design and drafting using two-dimensional orthographic projection drawing techniques. Emphasis is placed on sketching/layout techniques for personal-computer-based CADD system operations. A series of increasingly difficult drafting assignments, ending with presentation-quality CADD drawings will be the major outcome of the course.

Upon successful completion of this course, students should be able to:
• Use appropriate sketching techniques to lay out a drawing, establish drawing parameters, determine set-up criteria and represent the conceptual aspects of views for a two-dimensional drawing.
• Use various input devices, display, drawing and plotter commands to satisfy the specific requirements for completing drawings for both the mechanical and construction industries.
• Modify and correct redlined orthographic drawings, using Inquiry and Edit commands available in the CADD software.
• Provide annotation, in the form of standardized dimensions, notes, bill of materials, tabulation tables and other text on drawings.
• Develop, structure and manage related drawing files and previously prepared drawings to associate desired information and entities for the creation of a specific set of final drawings.
• Apply basic through intermediate techniques of drafting composition and development for plotting scaled views in various viewport configurations.
• Create two-dimensional engineering charts, graphs and tables.
• Develop User Coordinate Systems to facilitate drafting of intermediate through advanced drafting views to include orthographic, axonometric and auxiliary planar views.

Prereq. TCC 112
3 Credits 2 Weekly Lecture Hours

TCC 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

TCC 228 Design Project Methods
A capstone course applying the principles of design to the completion of a comprehensive individualized (or group) project in a student’s selected field. Emphasis is placed on the decision-making roles and interactions of varied members of the professional design team.

Upon successful completion of this course, students should be able to:
• Identify design-problem parameters by analyzing needs and setting objectives based on conditions of use and performance requirements.
• Discuss the selection of materials for the design solution on the basis of properties, cost and manufacturing or construction processes.
• Produce a preliminary design, sufficient to answer questions of economic feasibility, functional feasibility, and acceptability of character and appearance.
• Plan and apply a service test to the preliminary design, making certain that the solution will meet end-use requirements.
• Discuss specification development for documenting a design solution.
• Create a comprehensive checklist of design procedures or methods.
• Document the design, including detail and assembly drawings, supporting documents and schedules.
• Use computer systems to create a design presentation package.

Prereq. TCC 122 and either TDD 216 or TME 210
3 Credits 1 Weekly Lecture Hour 4 Weekly Laboratory Hours

(TCS) Construction Technology

TCS 100 Construction Blueprint Reading
This course presents fundamentals in the understanding and use of basic construction drawings to determine methods and materials of light construction. Emphasis is placed on architectural symbols, use of scales, applied geometry and orthographic projection.

Upon successful completion of this course, students should be able to:
• Develop the ability to read and thoroughly understand architectural plans for residential and light-commercial buildings.
• Obtain better understanding of residential and light-commercial construction practices.
• Develop an attitude of critical and orderly thinking in reading technical drawings.
• Understand the various types of reference sources and use them effectively.
• Prepare for advanced studies in architectural construction fields.

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TCS 108 Construction Supervision
Includes the basics of a supervisor’s duties while on a construction project. The supervisor must define objectives that meet with the overall strategy of the organization and achieve results through the efforts of others; constantly evaluate and control production performance and motivate subordinates, a “jack-of-all-trades” under the most adverse circumstances. All too often many skilled craftsmen are thrust into managerial positions without proper training and background and begin to learn by making mistakes in communicating, planning the job, human relations and the effective use of their own valuable, limited time. This course deals, in depth, with the what, why, how, when and where of construction supervision.

Upon successful completion of this course, students should be able to:
• Assume the responsibilities and authority of the supervisor’s position.
• Apply the various techniques employed in motivating subordinates.
• Use communication in leadership and utilize these necessary skills effectively.
• Use scientific techniques in problem solving and apply these to assigned case studies.
• Know what is expected of him/her relative to such items as contract documents; estimate preparation; state, federal and local forms; architectural specifications; building codes, etc.
• Apply construction supervisor’s responsibilities relative to setting up and controlling a job site.

3 Credits 3 Weekly Lecture Hours

TCS 109 Construction Project Administration
This course provides an introduction to the principles and techniques of construction project administration (CPA). In addition to the tactical decision making involved in site supervision, field personnel are required to contribute to the overall management system for planning and implementing the construction phases of a building project. The CPA system provides the overall contractor organization with an informed decision-making process, which guides the site supervisor in selecting the best means to expedite a job and provides the necessary data flow for accounting functions like billing and payroll. The CPA system also generates project records necessary for organizational processes such as liability management, costing and bidding, and organizational improvement. This course will prepare the student to participate in the CPA processes for project phasing and scheduling, cost estimating and control, and contract management.

Upon successful completion of this course, students should be able to:
• Describe the critical elements of pre-construction operations
• Explain critical inputs to the process for construction planning and scheduling
• Monitor work progress
• Diagram the elementary work activities given for the job
• Track time duration information for activity completion
• Outline a logical order in which given work items must be done
• Discuss the elements of a sound job philosophy and the means for implementation
• Compare variations in type and elements of basic construction contracts
• Describe standard procedures for quality control in materials and workmanship
• Describe standard procedures for handling changes, claims and disputes
• Administer standard documents and procedures for construction project closeout
• Explain the documents required to recommend/allocate the final phase of payment and waiver of liens

3 Credits 3 Weekly Lecture Hours

TCS 111 Methods/Materials of Construction I
This is the first course of a two-part introduction to the materials, assemblies and methodologies of general construction organized around Construction Specifications Institute division format. Topics begin with sitework and excavation techniques and proceed through basic building systems in concrete, masonry, wood, plastic and metal. Emphasis is placed on exploring the impact of design decisions and construction scenario on the final product. Case studies and project simulations are an integral part of the course.

Upon successful completion of this course, students should be able to:
• Relate standard construction documentation to the materials and methods of general construction
• Describe and discuss building components from the perspective of material source and manufacture
• Identify and discuss building systems from the perspective of component assemblies and construction methodology
• Perform critical analysis and problem solving relative to construction project case studies and simulation scenarios

Prereq. TCS 100
3 Credits 3 Weekly Lecture Hours
TCS 112 Methods/Materials of Construction II
This is the second course of the two-part introduction to the materials, assemblies and methodologies of general construction organized around Construction Specifications Institute division format. Topics begin with building envelope systems and proceed through finishes, building equipment and basic systems. Emphasis is placed on exploring the impact of design decisions and construction scenario on the final product. Case studies and project simulations are an integral part of the course.
Upon successful completion of this course, students should be able to:
• Relate standard construction documentation to the materials and methods of general construction.
• Identify and discuss building components from the perspective of material source and manufacture.
• Identify and discuss building systems from the perspective of component assemblies and construction methodology.
• Perform critical analysis and problem solving relative to construction project case studies and simulation scenarios.
Prereq. TCS 111
3 Credits 3 Weekly Lecture Hours

TCS 131 Estimating I
A method of standard construction estimating procedure from take-off to bid. The course includes excavation, concrete, steel, masonry, carpentry, alteration work, mechanical work, electrical work, and general conditions.
Upon successful completion of this course, students should be able to:
• Demonstrate fundamental estimating skills.
• Interpret construction plans and specifications.
• Develop an estimate to include summaries and costs by category.
Prereq. MAT 110, TCS 100
3 Credits 3 Weekly Lecture Hours

TCS 132 Estimating II
A continuation of Estimating I. This occurs as a laboratory presentation utilizing all acquired knowledge to compile essential data for an actual estimate.
Upon successful completion of this course, students should be able to:
• Complete an actual estimate from drawings and specifications within the time limits allowed by the bid documents.
• Obtain experience with the functions performed in a builder’s office.
Prereq. TCS 131
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TCS 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

TCS 221 Construction Survey and Layout
An introduction to the fundamentals of engineering construction and land surveys. Topics include surveying references, accuracy and errors, measurement of horizontal and vertical distances, and the measurement of angles.
Upon successful completion of this course, students should be able to:
• Determine the horizontal location of a point and the direction to a second point utilizing coordinate geometry, azimuths, bearings and offsets.
• Determine the degree of accuracy of a survey and distinguish between types of errors.
• Calculate horizontal distances through the application of correction factors for temperature, tension, slope and tape calibration to field measured distances.
• Determine the vertical location of a series of points with respect to a given datum.
• Determine the difference in elevation between two points.
• Measure accurate horizontal and vertical angles between two points.
• Establish a line at a given angle of intersection with a known line.
• Determine the magnetic bearing of a line.
Prereq. MAT 110, TCS 100
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TDD 128 Detailing-Assembly-Fixture Design
Concentrating on the appropriate documentation of the engineering design intent, this course introduces the technician to the concepts, skills and tools for developing formal, precisely constructed detail, assembly, fixture and tooling drawings. Knowledge and application of graphical principles for the creation of mechanical drawings is demonstrated through freehand sketching as well as the use of a computer-aided drafting/design system. The importance of standards, documentation and the appropriate use of technical graphics to compliment the communication process will be stressed throughout.
Upon successful completion of this course, students should be able to:
• Describe user coordinate systems, workplanes and coordinate data, using absolute, relative, polar and spherical coordinates, as well as coordinate filters, to create planar, prismatic and three-dimensional curved features on drawings.
• Create semi and logarithmic scales and charts, as well as three-dimensional pictorial line and pie charts, bar graphs, scatter plots and surface plots.
• Construct three-dimensional drawings consisting of wireframe, primitives and solids; and utilize software features to determine the mass properties of a three-dimensional solid models.
• Utilize descriptive geometry techniques to draft three-dimensional intersections and developments.
• Compose axonometric, oblique and perspective view drawings.
• Construct orthographic, isometric and auxiliary view drawings utilizing parametric modeling software.
• Develop three-dimensional drawings to include assembly drawings using parametric constraint/ modeling techniques.
• Make sections, profiles and cut away views of three-dimensional objects, including constrained drawings.
• Apply intermediate to advanced rendering, shading and animation techniques to optimize technical design presentations.

TDD 203 Kinematics
This course provides an introduction to mechanisms used for transmitting forces, controlling position, determining spatial interference and providing feedback information.
Upon successful completion of this course, students should be able to:
• Set up and solve basic problems in spatial motion analysis, using both graphical and analytical methods.
• Design simple mechanisms.
• Draw simple mechanisms.
• Set up and solve kinematic problems involving straight-line motion, rotary motion, and combined motion.
• Solve problems involving cams, gears and gear trains.
Prereq. MAT 110, PHY 100 Coreq. TME 231, TCC 112
3 Credits 2 Weekly Lecture Hours 3 Weekly Laboratory Hours

TDD 216 Three Dimensional CADD
This course provides instruction in advanced computer-aided design and drafting (CADD) techniques in addition to creation of three-dimensional drawings. Students progress from two-dimensional projection to wireframe, surface modeling, solids modeling and rendering techniques. Emphasis will be placed on challenging the student to acquire the skills necessary to develop a personal computer-based CADD system to develop a series of increasingly difficult drafting assignments and ending with a presentation quality final project and portfolio of completed drawings.
Upon successful completion of this course, students should be able to:
• Describe user coordinate systems, workplanes and coordinate data, using absolute, relative, polar and spherical coordinates, as well as coordinate filters, to create planar, prismatic and three-dimensional curved features on drawings.
• Create semi and logarithmic scales and charts, as well as three-dimensional pictorial line and pie charts, bar graphs, scatter plots and surface plots.
• Construct three-dimensional drawings consisting of wireframe, primitives and solids; and utilize software features to determine the mass properties of a three-dimensional solid models.
• Utilize descriptive geometry techniques to draft three-dimensional intersections and developments.
• Compose axonometric, oblique and perspective view drawings.
• Construct orthographic, isometric and auxiliary view drawings utilizing parametric modeling software.
• Develop three-dimensional drawings to include assembly drawings using parametric constraint/ modeling techniques.
• Make sections, profiles and cut away views of three-dimensional objects, including constrained drawings.
• Apply intermediate to advanced rendering, shading and animation techniques to optimize technical design presentations.
• Use various display, drawing and plotter parameters and commands to satisfy the specific requirements of a 3D design/drafting assignment.

Prereq. TCC 122
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TDD 225 Computer Aided Drafting
An introduction to computer-aided drafting through familiarization with computers and software used, and investigation of the knowledge and skills required of an operator of computer-aided drafting systems. Emphasis is on the IBM microcomputer-based systems, which will be learned through accomplishment of a series of increasingly complex drafting assignments.

Upon successful completion of the course, students should be able to:
• Identify the components of a typical computer-aided drafting system.
• Boot up (start) the system in preparation for beginning a new drawing or editing an existing drawing.
• Identify a drawing, establish drawing parameters and use menus or commands appropriately to begin work on the drawing.
• Enter pertinent data for the drafting assignment, using absolute and relative coordinates, last coordinates, keyboard and digitizing or pointing devices.
• Operate the display controls including WINDOW, PAN and other drawing and screen control commands to satisfy the specific requirements of the drafting assignment.
• Modify and correct drawings using the edit commands.
• Provide dimensions, notes, bills of materials and other text on drawings as necessary to satisfy the information requirements of manufacturing or construction.
• Use drawing libraries composed of standard shapes and components, or previously prepared drawings to insert information and entities in current drawings.
• Plan, lay out and complete the necessary drawings to describe a design, manufacturing or construction project selected by the student as an individual or as a member of a planning group.
• Save (on disk) and plot drawings produced with the microcomputer-based systems.

Prereq. TDD 124 or ARC 100
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TDD 227 Advanced CADD
This course provides students with computer-aided drafting design (CADD) software customization techniques. Emphasis includes improvement of software function via menu customization, proper installation of the software, macro programming and management of electronic files. Additionally, activities associated with the evaluation of newly evolving CADD related systems provides skills appropriate for identifying specialized design and drafting career opportunities.

Upon successful completion of this course, students should be able to:
• Use a text editor to create and modify computer software files.
• Write macros to simplify CADD system operations and maximize speed and accuracy.
• Structure and edit menus to enhance CADD software module access and performance capabilities.
• Customize CADD support files such as prototype drawings, line types, hatch, text fonts, and styles and slide libraries.
• Create customized CADD Help files, icon and menus.
• Assemble a career growth portfolio to represent expertise in CADD customization.

• Develop a methodology for evaluating new computer software and related technologies for computer-aided drafting and design.
• Utilize object linking and extracting technology to create integrated graphics/textual databases for productivity optimization.

Prereq TCC 122
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TEC 200 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

TEC 280 Tech Study Assess
These course numbers reflect credits awarded for prior learning in areas such as apprenticeship training, military training or trade/professional education. These credits apply to the Technical Studies degree. The student must work with an assessment counselor to develop a personal education plan before the credits are awarded. Up to 20 credits may be awarded toward the Technical Studies degree, but the student will not be considered an appropriate candidate for the Technical Studies degree if he/she does not qualify for TEC 280 and TEC 281, i.e., 10 credits.

5 Credits

TEC 281 Tech Study Assess
These course numbers reflect credits awarded for prior learning in areas such as apprenticeship training, military training or trade/professional education. These credits apply to the Technical Studies degree. The student must work with an assessment counselor to develop a personal education plan before the credits are awarded. Up to 20 credits may be awarded toward the Technical Studies degree, but the student will not be considered an appropriate candidate for the Technical Studies degree if he/she does not qualify for TEC 280 and TEC 281, i.e., 10 credits.

5 Credits

TEC 282 Tech Study Assess
These course numbers reflect credits awarded for prior learning in areas such as apprenticeship training, military training or trade/professional education. These credits apply to the Technical Studies degree. The student must work with an assessment counselor to develop a personal education plan before the credits are awarded. Up to 20 credits may be awarded toward the Technical Studies degree, but the student will not be considered an appropriate candidate for the Technical Studies degree if he/she does not qualify for TEC 280 and TEC 281, i.e., 10 credits.

5 Credits

TEC 283 Tech Study Assess
These course numbers reflect credits awarded for prior learning in areas such as apprenticeship training, military training or trade/professional education. These credits apply to the Technical Studies degree. The student must work with an assessment counselor to develop a personal education plan before the credits are awarded. Up to 20 credits may be awarded toward the Technical Studies degree, but the student will not be considered an appropriate candidate for the Technical Studies degree if he/she does not qualify for TEC 280 and TEC 281, i.e., 10 credits.

5 Credits

(TEL) Technologies

TEL 101 D C Analysis
This course is a core requirement in all Electronics programs. The course covers the basic principles of direct current circuits containing passive elements, including transient circuit analysis. Circuit theory and conversions will also be examined. Troubleshooting of basic resistive circuits with both a theoretical and a hands-on approach will be applied. Experiments are performed in conjunction with all major topics. Basic electronic testing equipment will be used in conjunction with all lab experiments, including the Digital Multimeter and the Analog Multimeter.

Upon successful completion of this course, students should be able to:
• Understand and use electric circuit terminology.
• Analyze resistive circuits.
• Follow necessary safety precautions in dealing with electrical equipment.
• Connect simple circuits following schematic diagrams.
• Use basic electrical measuring equipment.
• Produce a readable, informative laboratory report.

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

TEL 102 A C Analysis
AC (Alternating Current) circuit analysis extends the basic concepts introduced in DC Analysis (TEL 101) to incorporate time-varying voltages and currents. The basic behavior of capacitors and inductors are introduced and series/parallel circuits driven by sinusoidal sources are analyzed using both phasors (vectors) and complex numbers and computer circuit analysis programs. Theoretical concepts are illustrated in the weekly two-hour lab sessions where various test equipment are used to measure experimentally the resultant characteristics of sinusoidal voltages and currents. Power (real, reactive, apparent) in various AC circuit configurations, including series/parallel resonance, is analyzed.

Upon successful completion of this course, students should be able to:
• Convert circuit elements from time domain to phasor (complex) representation and from phasor back to time domain.
• Analyze currents and voltages in RL, RC, RLC circuits using phasors.
• Use a computer software analysis program to obtain various currents and voltages in RL, RC, and RLC circuits.
• Calculate reactive, apparent and real power in single phase and multiphase circuits.
• Analyze series and parallel resonant circuits.
• Analyze transformer circuits.
• Use various test equipment properly.
• Produce an accurate and neat laboratory report.

Prereq. TEL 101 and MAT 111
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

TEL 110 Electronics I
This course utilizes an integrated approach to learning. A topic will be introduced and discussed, developed into a practical circuit, analyzed for faults, and evaluated with a prelab using a commercially accepted software package. The circuits are built, tested and reported in the lab experiments. The course covers basic semiconductor theory, Diode theory, Zener diodes, special use diodes and LEDs. Bipolar transistors to include biasing, D.C. load lines, transistor operation and data sheets are discussed. Power supply circuits and transistor amplifiers are analyzed. Experiments are performed in conjunction with all major topics to reinforce theory. The use of the oscilloscope will be introduced.

Prereq. TEL 101 and MAT 111
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

COURSE DESCRIPTIONS 155

Delaware County Community College
Upon successful completion of this course, students should be able to:

- Interpret binary, octal, hexadecimal, and ASCII codes and number systems. Define basic microprocessor terminology.
- Describe the operation of a microprocessor.
- Define basic programming terminology.
- Describe the features of the 8085 microprocessor.
- Write assembly programs using proper syntax.
- Use basic flowchart techniques to clarify and troubleshoot program execution. Execute programs and verify results using the Hewlett-Packard microprocessor trainer.

**Prereq. TEL 101 Coreq. TEL 121**

**3 Credits**

**2 Weekly Lecture Hours**

**2 Weekly Laboratory Hours**

**TEL 126 Microprocessor II**

This course is a continuation of the study of microprocessors. Hardware and software concepts covered in Microprocessors I (TEL 124) are integrated into a study of the interfacing of various I/O devices. Hardware and software experiments are performed using the Hewlett-Packard trainer.

Upon successful completion of this course, students should be able to:

- Describe how to interface to the 8085 MPU.
- Describe and program various programmable devices, such as the 8155, 8255A, 8254 and 8251A.
- Interface D/A and A/D converters to the 8085 MPU.
- Describe serial I/O and data communications.
- Describe the use of interrupts in interfacing with I/O devices.

**Prereq. TEL 124**

**3 Credits**

**2 Weekly Lecture Hours**

**2 Weekly Laboratory Hours**

**TEL 111 Electronics II**

This course covers differential amplifiers, operational amplifier operation, basic OP-AMP circuits, OP-AMP design considerations, components and times as well as audio circuits to include audio amplifiers, power amplifiers and filters. Experiments are performed in conjunction with all major topics to reinforce theory.

Upon successful completion of this course, students should be able to:

- Define the properties, characteristics, and applications of operational amplifiers. Recognize and describe the operation of basic OP-AMP circuits.
- Describe the OP-AMP design concepts.
- Describe the basic concept of the voltage regulator, voltage references and current reference.
- Describe the concepts of audio circuits.

**Prereq. TEL 110**

**4 Credits**

**3 Weekly Lecture Hours**

**2 Weekly Laboratory Hours**

**TEL 128 Computer System Electronics**

The fundamentals of various components used in microcomputer systems and their hardware/software support are discussed. Methods of determining system faults at the system, unit, board and component levels are studied. Typical computer/digital systems and test equipment are introduced in the weekly laboratory session.

Upon successful completion of this course, students should be able to:

- Diagnose and troubleshoot hardware and software problems.
- Analyze signal flow at system level.
- Differentiate between software and hardware problems.
- Construct hardware prototypes.
- Generate software.
- Perform system calibration and testing.
- Interface various computer devices and accessories.

**Prereq. TEL 126**

**3 Credits**

**2 Weekly Lecture Hours**

**2 Weekly Laboratory Hours**

**TEL 199 Co-op/Internship**

Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

**TEL 200 Electro/Mechanical Systems**

This course examines the behavior of electrical and mechanical components used in interfacing the machine environment to the outside world. The course concentrates on the behavior of input and output devices used to detect, measure and control mechanical, thermal, fluid, optical and electrical processes.

Upon successful completion of this course, students should be able to:

- Analyze the characteristics and behavior of various input devices and transducers.

**TEL 210 Troubleshooting and Repair**

This course is an applied course in Electronics, which aims to provide the student with clear and concise instruction on how to repair consumer electronics equipment. Students will discuss the operation of basic electronic systems such as amplifiers, power supplies, stereo receivers and CD players. Schematic diagrams and block diagrams will be studied for call type of device. The techniques utilized in this course are universally applicable in all types of electronic equipment regardless of their application. Theory and applications acquired in pre-requisite electronic courses will be applied to Troubleshooting and Repair.

Upon successful completion of this course, students should be able to:

- Define safety procedures for troubleshooting electronic equipment.
- Demonstrate a process for finding fault in electronic circuits.
- Demonstrate the techniques used to locate various faults in a basic guide amplifier system.
- Demonstrate the ability to solder and desolder components in a PC board.
- Analyze and define the operation of a basic split DC power supply.

**TEL 202 Biomedical Instrumentation**

This course provides a perspective on the essential aspects of biomedical equipment. It covers practical matters such as operation, calibration, maintenance and troubleshooting of medical equipment. Topics covered by this course include an overview of the human body, the heart and the circulatory system. It also covers electrosurgical and transducers, bioelectric amplifiers, electrocardiographs, intensivist care units, electro-optics, computers in biomedical equipment and electrical safety in the medical environment. Experiments are performed in conjunction with all major topics to reinforce theory.

Upon successful completion of this course, students should be able to:

- Define major systems, characteristics and principle functions of the human body.
- Describe the characteristics and properties of electrodes, transducers and bioelectric amplifiers.
- Describe the fundamentals and properties of electrocardiographs, the intensive care unit and operating rooms.
- Define electrical safety as applied to medical institutions.
- Define the characteristics and the properties of electro-optics in the biomedical field.
- Describe the operation and the characteristics of computers used in Biomedical equipment.

**Prereq. TEL 110 Coreq. TEL 111**

**4 Credits**

**3 Weekly Lecture Hours**

**2 Weekly Laboratory Hours**

**TEL 124 Microprocessor I**

This covers the basics of microprocessor architecture and programming. Technical terms and conventions, program execution and addressing modes, and computer arithmetic and logical operations are covered in detail. Intel’s 8085 microprocessor is used to illustrate programming and architecture concepts incorporated in Intel’s more advanced microprocessors. Programming exercises are performed on the Hewlett Packard trainer in weekly 2 hour lab sessions.

Upon successful completion of this course, students should be able to:

- Be able to use various test equipment to localize probable faults in a control system.

**Prereq. TEL 101 Coreq. TEL 121**

**4 Credits**

**3 Weekly Lecture Hours**

**2 Weekly Laboratory Hours**

**DELTADE COUNTY COMMUNITY COLLEGE**
• Utilize the manufacturers’ service manual for repair and adjustments for pioneer models SX-251R and PD-102
• Demonstrate the ability to repair a stereo receiver Pioneer Model SX-251R and a CD player Pioneer Model PD-102.

Prereq. TEL 110
4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

TEL 259 Nanofabrication Manufacturing Seminar
This course gives an overview of typical Nanofabrication applications and provides an introduction to Nanofabrication Manufacturing Technology.

Upon successful completion of this course, students should be able to:
• Understand the typical application of Nanofabrication Manufacturing and obtain an overview of the industry.
In order to demonstrate this competency, the student should be able to:
• Describe the various types of businesses in the nanotechnology field.
• Explain the applications of the nano field.
• Outline the career opportunities available in this field.
Prereq. TEL 101
1 Credit 2 Weekly Lecture Hours

TEL 260 Materials, Safety, Health Issues and Equipment - Special Studies
This course provides an overview of basic nanofabrication processing equipment and material chemistry and handling procedures. The focus is on cleanroom protocol, safety, environmental and health issues in equipment operation and materials handling.

Safety and health issues will be covered for the following topics: cleanroom operation; vacuum pump systems operation; furnace operation; chemical vapor deposition system operation; and vacuum deposition/etching system operation. Specific materials handling issues will include deionization water, solvents, cleaners, ion implantation sources, diffusion sources, photoresists, developers, metals, dielectrics, and toxic, flammable, corrosive, and high purity gases as well as packaging materials.

Upon successful completion of this course, students should be able to:
• Identify the basic nanofabrication processing equipment.
• Describe the uses and applications of the basic nanofabrication processing equipment.
• Identify safety hazards associated with nanofabrication.
• Explain the fundamentals of vacuum technology including pumps, components, and metrology.
• Identify materials used in nanofabrication manufacturing.
• Operate material metrology equipment.
• Associate the material handling issues with each identified nanofabrication material.
• Explain basic chemical properties of materials.
• Summarize basic cleanroom operation and protocol.
• Demonstrate an understanding of basic cleanroom operation and protocol.
Prereq. TEL 111, TEL 121, TEL 210, MAT 210, ENG 112
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TEL 261 Basic Nanofabrication Process
This course provides an overview of basic processing steps in Nanofabrication (contact lithography, basic etching and deposition techniques). The majority of the course details a step-by-step description of the equipment and processes needed to fabricate devices and structures. Processing flow will be examined for structures such as microelectronic devices including diode and the MOS capacitor. Students receive an in depth introduction to basic lithography from wafer preparation to final inspection. Contamination issues in nanofabrication are discussed in detail. Students will learn the similarities and differences in both equipment and process flows for each configuration by undertaking “hands-on” processing.

Upon successful completion of the course, students should be able to:
• Perform basic lithography processes.
• Operate contact lithography equipment.
• Operate optical microscopes and imaging software.
• Operate metrology equipment.
• Explain electrical characterization equipment.
• Describe the basic steps in p-n junction diode process flow.
• Identify the equipment in a p-n junction diode process flow.
• Explain the processes in plasma etching techniques.
• Identify the equipment in a MOS capacitor process flow.
• Compare the similarities and differences in equipment and process flow for the process flows listed above.
Prereq. TEL 260
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TEL 262 Thin Film in Nanofabrication
This course covers advanced thin film deposition and etching practices in nanofabrication. Advanced deposition techniques covered in the first part of the course include atmosphere, low-pressure and plasma enhanced chemical vapor deposition, sputtering, thermal and electron beam evaporation. The study of materials includes dielectrics, polysilicon and metals. The second part of the course focuses on advanced etching practices and techniques emphasizing reactive ion etching, high-density plasma systems, ion beam etching, and wet chemical etching. Students will receive hands-on experience in depositing and etching dielectric, semiconductor, and metallic materials using state-of-the-art tools and practicing many of the steps critical to nanofabrication of semiconductor devices including microelectronics, MEMs devices, display structures, and structures used in the biotechnology fields.

Upon successful completion of this course, students should be able to:
• Explain all chemical vapor deposition (CVD) processes used in nanofabrication.
• Explain the operation of CVD equipment.
• Describe the uses of different CVD thin films in nanofabrication.
• Explain all physical vapor deposition (PVD) processes used in nanofabrication.
• Set up and operate equipment to perform PVD.
• Describe the uses of different PVD thin films in nanofabrication.
• Explain the processes in wet chemical etching techniques.
• Set up and operate equipment to perform wet chemical etching.
• Describe the uses of wet chemical etching techniques.
• Explain the processes in plasma etching techniques used in nanofabrication.
• Set up and operate equipment to perform plasma etching.
• Describe the uses of plasma etching techniques.
• Operate a scanning electron microscope for materials characterization.
Prereq. TEL 261
3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TEL 263 Lithography for Nanofabrication
This course covers all aspects of advanced lithography from design and mask fabrication to pattern transfer and inspection. The course is divided into three major sections. The first section describes the advanced lithographic process from substrate preparation to exposure. Most of the emphasis is on understanding the nature and behavior of photore sist materials. The second section examines systems and techniques that define patterns. This section will introduce specialized optical masks and reticles, aligners, steppers and scanners. In addition, critical dimension (CD) control and profile control of photore sist will be investigated. The last section will discuss advanced optical lithographic techniques such as phase shifting, masks and illumination schemes as well as e-beam, e-ray, EUV, and ion beam lithography. A section about engineering dielectrics is also discussed.

Upon successful completion of this course, students should be able to:
• Explain the process steps necessary to produce a photolithographic pattern in positive, negative and chemically amplified resists.
• Describe the nature and behavior of photoactive materials such as BCB.
• Describe all lithographic techniques in nanofabrication.
• Explain mask layout and fabrication for photolithography.
• Describe and perform alignment and registration in photolithography.
• Identify the equipment used in photolithography.
• Set up and operate equipment used in photolithography.
• Modify profiles in photore sist for liftoff applications.

Prereq. TEL 262
3 Credits 2 Weekly Lecture Hours

TEL 264 Materials Modification in Nanofabrication
This course will cover in detail the processing steps used in modifying material properties in nanofabrication. An intensive study of metals used in nanotechnology aids the student in understanding the various methods of metalization such as CVD, evaporation, and sputtering. Metal applications for interconnect technologies will be examined. Aluminum, refractory metals and copper deposition techniques and characterization will be discussed in detail along with topics such as diffusion barriers, contact resistance, electromigration, corrosion, stress effects, and adhesion. Other modification technologies such as ion implantation, diffusion and surface preparation and treatment are integrated as well.

An intensive study of dielectric properties and materials including dielectric constant engineering, mechanical, optical, and electrical characteristics, poly, BSG, PSG, SOG, and BPSG gives the student further insight into advanced device fabrication. Material properties and basic device structures will be discussed for the optoelectronic market.

Upon successful completion of this course, students should be able to:
• Contrast thermally grown oxides with spin on dielectrics.
• Identify the processing equipment for silicides, etching and polishing.
• Describe the procedures for silicidation, etching, polishing, and epitaxial growth.
• Perform advanced fabrication techniques.
• Determine the processing parameters of dielectric materials.
• Explain the concept of engineering dielectric constants for different nanofabrication applications.
• Explain metatization techniques and processing equipment.
• Select appropriate materials to match the design needs of nanofabricated devices.
• Describe the process of direct bandgap photonic emission.
• Examine common materials and properties for the optoelectronic market.
• Describe the need for optoelectronic devices.

**PREREQ. TEL 263 CONC. TEL 265**

**3 CREDITS 2 WEEKLY LECTURE HOURS 2 WEEKLY LABORATORY HOURS**

**TEL 265 Characterization, Packaging and Testing of Nanofabrication Structures**

This course examines a variety of techniques and measurements essential for controlling device fabrication and final packaging. Students will revisit concepts such as residual gas analysis introduced in TEL 261, optical emission spectroscopy (OES) and end point detection as introduced in TEL 263. Characterization techniques such as surface profilometry, advanced optical microscopy, optical thin film measurements, ellipsometry, and resistivity/conductivity measurement will be implemented on nanofabricated samples. Basic electrical measurements on device structures for yield analysis and process control will also be stressed. These will include breakdown measurements, junction testing, and C-V and Φ-V tests and simple transistor characterization. In addition, students will examine mechanical as well as electrical characterizations of nanoscale structures for biological/biomedical applications. The students will perform DNA analysis by learning and performing the polymerase chain reaction for DNA replication. They will also study and manufacture microfluidic channels for biological analysis. An extensive overview of biology will be given with emphasis on biocompatible materials. The students will also learn about the manufacturing issues involved in subjects such as interconnects, isolation, and final device assembly. The importance of planarization techniques such as deposition/etchback and chemical/mechanical polishing will be emphasized. Lastly, packaging procedures such as die separation, inspection bonding, sealing and final test for both conventional ICs and novel MEM and biomedical devices will be examined.

Upon successful completion of this course, students should be able to:

- Describe various process monitoring techniques used in nanofabrication.
- Design a process flow for a NMOS transistor from wafer preparation to packaging.
- Present the NMOS transistor overview in power point format, with emphasis on process interrelationships.
- Describe various material characterization techniques used in nanofabrication.
- Use the C-V and Φ-V testing techniques utilizing devices made using the process flows of TEL 262.
- Identify the equipment employed for final assembly.
- Explain the processes of final assembly.
- Describe the importance of nanofabricated biocompatible materials.
- Replicate and quantify DNA fragments utilizing the polymerase chain reaction and gel electrophoresis.
- Describe the issues associated with metalization and planarization.
- Identify the equipment associated with metalization and planarization.
- Operate equipment for metalization.
- Describe the test procedures associated with packaging.
- Describe the issues associated with packaging.
- Identify the equipment associated with packaging.

**PREREQ. TEL 263 CONC. TEL 264**

**3 CREDITS 2 WEEKLY LECTURE HOURS 2 WEEKLY LABORATORY HOURS**

**TEL 301 Basic Telecommunications**

This course presents an overall view of the telecommunication industry with emphasis on the systems approach. Seven major areas are discussed: basic telecommunication, television, the telephone system, satellite communication, fiber optics, fiber-optic systems and cellular radio.

Upon successful completion of this course, students should be able to:

- Discuss the Federal Communication Commission (FCC) and the scope of their justification.
- Describe telecommunication systems and network.
- Discuss the services of the telecommunication industry.
- Discuss the telephone system.
- Discuss the future of the telecommunication industry.

**PREREQ. TEL 110**

**3 CREDITS 3 WEEKLY LECTURE HOURS**

**TEL 302 Radio Frequency Communication Systems**

RF communications, noise and special communication circuits are introduced first. Various modulation techniques are then discussed in depth. Discussion of radio receivers and transmitters, wave propagation, antennas and transmission lines forms an integral part of this course.

Upon successful completion of this course, the students should be able to:

- Define the basic communications system.
- Demonstrate a fundamental knowledge of electromagnetic waves.
- Understand a variety of transmission lines and their characteristics.
- Define the properties, characteristics and applications of antennas.
- Distinguish the difference between time and frequency domain.
- Define the concept of noise and how noise affects communications systems.
- Evaluate the properties of components that make up communications systems.
- Describe the properties and demonstrate the concepts and applications of phase-locked loops and synthesizers in communications systems.
- Define the properties, characteristics and applications of amplitude modulation.
- Define the properties and characteristics of frequency modulation.
- Discuss the advantages of using single sideband transmission.

**PREREQ. TEL 301**

**4 CREDITS 3 WEEKLY LECTURE HOURS 2 WEEKLY LABORATORY HOURS**

**TEL 303 Digital and Data Communications**

This course provides a clear and comprehensive introduction into what makes up a data communications system. Topics such as LANS, Packet Switching and ISDN are introduced.

Upon successful completion of this course, students should be able to:

- Define the properties and the characteristics of various types of carriers and services.
- Distinguish the difference between various code sets.
- Define the characteristics of synchronous and asynchronous transmission.
- Discuss modems and interface.
- Describe system networks and architectures.

**PREREQ. TEL 301**

**4 CREDITS 3 WEEKLY LECTURE HOURS 2 WEEKLY LABORATORY HOURS**

**TEL 304 Telecommunication Structures**

This course examines a variety of techniques and measurements essential for controlling device fabrication and final packaging. Students will revisit concepts such as residual gas analysis introduced in TEL 261, optical emission spectroscopy (OES) and end point detection as introduced in TEL 263. Characterization techniques such as surface profilometry, advanced optical microscopy, optical thin film measurements, ellipsometry, and resistivity/conductivity measurement will be implemented on nanofabricated samples. Basic electrical measurements on device structures for yield analysis and process control will also be stressed. These will include breakdown measurements, junction testing, and C-V and Φ-V tests and simple transistor characterization. In addition, students will examine mechanical as well as electrical characterizations of nanoscale structures for biological/biomedical applications. The students will perform DNA analysis by learning and performing the polymerase chain reaction for DNA replication. They will also study and manufacture microfluidic channels for biological analysis. An extensive overview of biology will be given with emphasis on biocompatible materials. The students will also learn about the manufacturing issues involved in subjects such as interconnects, isolation, and final device assembly. The importance of planarization techniques such as deposition/etchback and chemical/mechanical polishing will be emphasized. Lastly, packaging procedures such as die separation, inspection bonding, sealing and final test for both conventional ICs and novel MEM and biomedical devices will be examined.

Upon successful completion of this course, students should be able to:

- Describe various process monitoring techniques used in nanofabrication.
- Design a process flow for a NMOS transistor from wafer preparation to packaging.
- Present the NMOS transistor overview in power point format, with emphasis on process interrelationships.
- Describe various material characterization techniques used in nanofabrication.
- Use the C-V and Φ-V testing techniques utilizing devices made using the process flows of TEL 262.
- Identify the equipment employed for final assembly.
- Explain the processes of final assembly.
- Describe the importance of nanofabricated biocompatible materials.
- Replicate and quantify DNA fragments utilizing the polymerase chain reaction and gel electrophoresis.
- Describe the issues associated with metalization and planarization.
- Identify the equipment associated with metalization and planarization.
- Operate equipment for metalization.
- Describe the test procedures associated with packaging.
- Describe the issues associated with packaging.
- Identify the equipment associated with packaging.

**PREREQ. TEL 263 CONC. TEL 264**

**3 CREDITS 2 WEEKLY LECTURE HOURS 2 WEEKLY LABORATORY HOURS**

**TEL 110 Materials Science**

This course introduces students to the structure, properties, use and design considerations of a variety of materials including ferrous metal, non-ferrous metals, ceramics and polymers.

Upon successful completion of this course, students should be able to:

- Determine the structure of materials.
- Select the proper material(s) according to their properties and use.
- Determine the properties and use of polymeric materials, plastics, polymeric coatings and adhesives.
- Determine the various applications of ceramics.
- Determine the heat-treatment sequence of steel.
- Determine the properties and use of stainless steel, copper, aluminum, nickel, zinc, titanium, magnesium and refractory metals.
- Select welding processes according to joint configuration and weldability.
- Identify the structure of a composite.
- Determine the purposes and applications of composites.

**3 CREDITS 3 WEEKLY LECTURE HOURS**

**TEL 111 Machining Technology**

This course provides an introduction to the knowledge and skills associated with various conventional chip making machine tools their design, application, set-up and operation. Theory and mathematical concepts and calculations associated with inspection techniques, tapers, digital readout quantifications, speeds, feeds, torque, horsepower, threading, indexing and unit cycle time determination will be covered. Emphasis will be placed on tooling and work holding requirements, and set-up and cutting tool materials (H.S.S., carbide, ceramic and diamond) selection. Additional topics include: an introduction to process planning, quality control charting - Statistical Process Control (SPC) techniques, and Geometric Dimensioning and Tolerancing (GD&T).

Upon successful completion of this course, students should be able to:

- Describe and perform practices and procedures required to safely complete operations involving cutoff and contour saws, drill presses, vertical and horizontal milling machines, engine lathes, pedestal and surface grinders.
- Identify the basic principles and terms associated with the interpretation of drawings for the manufacture and inspection of parts, with an emphasis on Geometric Dimensioning and Tolerancing.
- Implement various aspects of design, planning and organization for the production of manufactured parts.
- Discuss, in general terms, the nature, properties and types of materials used to produce manufactured parts.
- Refer to manufacturers’ catalogs and the theory of cutting tools to determine the application and the identification of appropriate cutting tool holders; adapters, cutters and inserts, and to develop a machining operation plan, including set-up and job sheets.
- Perform algebraic and trigonometric computations associated with the manufacture of piece-parts to include speeds and feeds, tapers, threads and indexing; and other mathematical calculations related to various machining parameters, machine selection, set-up and inspection of piece-parts.
- Utilize engineering drawings and precision instruments to produce parts on machine tools, to include cut-off and contour saws, drill press, vertical and horizontal milling machines, engine lathe, pedestal and surface grinders.
• Describe, in basic terms, the various considerations associated with special purpose machines, processes, mass production, hard and soft automation, and assembly techniques.

TME 115 Basic Technical Skills
This course develops hands-on skills essential to the technician. Basic technical skills are developed by the following a project from design to completion and testing.

Upon successful completion of this course, students should be able to:
• Apply basic accident-prevention practices and procedures.
• Interpret sketches, drawings and schematics.
• Use rules, micrometers, vernier calipers, dial indicators and other instruments to make accurate measurements.
• Perform basic electrical measurements.
• Employ basic hand-soldering/desoldering techniques for electronic component installation.
• Present technical information concisely and accurately.
• Demonstrate care-planning/job-seeking skills.
• Enter and execute a basic program on a personal computer or calculator.

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TME 199 Co-op/Internship
Refer to Cooperative Education and Internship description in the “Options for Earning College Credit” section of the catalog.

TME 210 CNC Operations
This course provides an introduction to the operation and manual programming of Computerized Numerically Controlled (CNC) machine tools including fundamental concepts, terminology and applications. The capabilities, advantages and disadvantages of numerically controlled equipment will be covered. Mathematical applications for definition of location, set-up, positioning and movement within specific coordinate systems will be presented. Various aspects of manual programming (G and M codes) and computerized conversational graphics modeling will be included. Criteria and practices basic to effective preventative maintenance, accident prevention practices and procedures, process planning, tooling, machine set-up and operation (dry-run, first and production runs) will be addressed also.

Upon successful completion of this course, students should be able to:
• Develop an appreciation for the aspects of Numerical Control (NC) and for production enhancement capabilities of Computerized Numerically Controlled (CNC) machine tools.
• Via manual methods, interpret and convert basic part drawings to procedural manufacturing process/operation, tooling and job plans for a CNC mill or a CNC lathe.
• Apply principles of mathematics, engineering piece-part print interpretation and geometric analysis techniques to describe a manufactured part’s datum points and planes, surfaces and feature locations in terms of two dimensional, interpolated machine axes and tooling positions.
• Utilize the concepts and techniques of manual programming to prepare and proof a written manuscript for the production of a manufactured part on a CNC mill and a CNC lathe.

• Demonstrate the ability to use concepts, techniques, hardware, software menus and computer system practices associated with a Computer Aided Machining/Distributed Numerical Control (CNC) system to write, save, retrieve and transfer CNC machine tool programs.
• Conduct CNC mill and lathe set-up, dry run, first run, inspection and adjustment techniques, and production run procedures and practices.

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TME 212 Computer Aided Machining
This course provides students with an introduction to off-line programming of Computerized Numerically Controlled (CNC) machine tools via the use of Computer Aided Machining (CAM) software. Emphasis is placed on becoming comfortable and productive with a CAM system operated as an automated process modeling tool. Fundamental concepts terminology and applications are stressed, as is the use of interactive software modules for modeling CNC operations. Topics include an introduction to the computer/plotter/printer as a work station, an overview of graphics modeling concepts, the application’s Graphical User Interface (GUI) and a thorough familiarization of selected icons and definitions. Generalized and specific activities associated with introductory computer-aided drafting (CAD)/CAM operations, job planning, piece-part geometry/tool path definition and part modeling will be covered. An introduction to workplanes and MACROS, as well as CNC code generation and machine communications, will be addressed. Milling and turning (with a minor emphasis on fabrication) operations will be stressed. Process modeling software packages for production milling and turning will be used as vehicles of instruction for this course.

Upon successful completion of this course, students should be able to:
• Develop the concepts necessary for interpretation and conversion of part drawings into proceduralized manufacturing process/operation, tooling sheets and job plans.
• Use computer software and hardware (including peripherals) to interactively create, edit and communicate job plans (to include tooling/operational information), CAM generated drawings and machine code files.
• Demonstrate a basic ability to transfer (and manipulate) 2D CAD/CAM design data for use in piece-part process modeling and experimentation.
• Formulate necessary logic (object/action techniques) and demonstrate knowledge of the software module’s capabilities to define, create and edit drawings, and tool path elements using formfree and continuous part profile and surface creation techniques.
• Complete activities associated with the verification of tool path motion, and for the creation of machine ready code, for piece-part production.
• Utilize advanced software features to describe, manipulate and perform repetitive tasks associated with the creation of a manufacturing process model.
• Conduct part program origin and workplane/transformations.

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TME 216 Statics and Strength of Material
This course provides students with a foundation in the general procedures and principles of the mechanical design process. Students solve force systems select components and determine resultants in equilibrium. Strength failures of various materials will also be studied in detail.

Upon successful completion of this course, students should be able to:
• Analyze and solve problems involving force systems, components, resultants and equilibrium.
• Determine center of gravity and centroids of members and objects.
• Identify moment of inertia of objects.
• Analyze simple structures under linear stress and strain.
• Investigate the effects of torsion on shafts and springs.
• Find the load, stress and deflection on beams.
• Analyze structures subjected to combined loading.

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TME 220 Robotics and Programmable Controls
This course provides an introduction to the field of robotics. The specific types of industrial robots their function and mode of operation will be addressed. The impact that programmable automation and the application of robotics is having on the worker, the workplace and on production planning will be discussed. Actuation and operational characteristics of robots will also be covered. A study of sensor and automation applications will be included.

Upon successful completion of this course, students should be able to:
• Discuss the effects that automation technology and industrial robots have on employees, employers and society in general.
• Describe the basic structure and mechanical configuration as well as the functional characteristics of various types of robots.
• Compare and contrast robotic/automated control systems.
• List the end-of-arm-tooling characteristics available to the production planner.
• Develop a list of accident prevention practices and procedures, and maintenance requirements for robotic work-cell operations.
• Explain the aspects of flexible applications inherent to a robot.
• Define the areas in manufacturing conducive to the utilization of robots.
• Describe the operation of a PLC and prepare programs to effect automatic control of processes.

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TME 221 Manufacturing Processes II
A continuation of Manufacturing Processes I. This course includes practical experience in machine operations. Hot-working manufacturing processes including laboratory production of simple molds, cores, castings and weldments are introduced.

Upon successful completion of this course, students should be able to:
• Describe principles of the major manufacturing processes and operations.
• Determine a plan for the layout, operation and quality check of chip-cutting (cold), forging and melting (hot) manufacturing processes.
• Produce a plan, layout and quality check of products by manufacturing processes.
• Form a product by casting.
• Form a product by forging.
• Perform basic heat-treating operations.
• Fabricate a product by welding.

2 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours
TME 222 Advanced Computer Aided Machining

This course provides introductory instruction on advanced piece-part modeling techniques of Computer-Aided Drafting/Design-Computer Aided Machining (CADD-CAM). A broad based instructional approach provides concepts necessary to applying process modeling techniques for both advanced milling and turning. Three-dimensional (combined surface types) geometry and associated tool path coding on multiple work and tool planes will be covered. Advanced solutions for completing four-axis simultaneous turning and integrated mill/turn (C-Axis) and ‘five’ tooling operations for modern lathes will be included also. Process modeling software packages for advanced three-dimensional machining and advanced turning will be used in instruction for this course.

Upon successful completion of this course students should be able to:

- Describe the basic concepts and performance requirements for effecting translation and manipulation of Computer-Aided Drafting/Design to Computer-Aided Machining (CADD-CAM) data for Computer Numerically Controlled (CNC) program creation.
- Complete advanced work and tool plane definition, and manipulate software functions to perform operational activities involving same.
- Conduct four- and five-axis position and rotary axis modeling as well as CNC code generation.
- Identify, create and perform operations on surface primitives and developed (3D composite) wireframe and surface geometry models.
- Create job plans and 3D surface geometry tool path and associated CNC machine tool code for piece-part production.
- Plan, create and program synchronized four-axis turning operations.
- Apply appropriate techniques for modeling mill/turn operations and for creating machine tool code.
- Plan, develop, edit and execute macros for family- of-parts operations.

Prereq. TME 212

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TME 229 Fluid Power and Controls

This course provides a study of the basic principles of industrial fluid mechanics hydraulics and pneumatics. Types of fluid, their condition and use in transmitting power throughout various circuits are addressed. Pumps and compressors, conductors, circuit components, application and control are also topics of coverage. Characteristics such as flow, pressure/vacuum, force, temperature, torque, speed, horsepower, efficiency, fluid and system conditioning, as well as component and circuit performance will be addressed. System design, component specifications and selection, will be examined also. Pilot and electromechanical control system features will be discussed and investigated. Instructional emphasis is placed on the relevant theoretical and practical aspects of the subject.

Upon successful completion of this course, students should be able to:

- Cite basic maintenance and accident prevention practices and procedures for fluid power and control system service and operation.
- Identify criteria and methods used to specify components, as well as commonly used fluids for pneumatic and hydraulic systems.
- Identify, classify and specify hydraulic and pneumatic prime movers, compressor/pumps, valves, conductors, filters and strainers.
- Determine cylinder load, speed, volume, pressure/vacuum, flow rate, and horsepower requirements.
- Size fluid conductors, receivers, reservoirs and accumulators based on fluid pressure, flow rates and volumetric requirements.
- Recognize standard graphic symbols for common pneumatic and hydraulic components.
- Lay out and sketch simple circuits using standard graphic symbols.
- Construct, demonstrate and investigate the use of various control devices, circuits and systems including pilot and electro/mechanical controls.

Prereq. PHY 100 Coreq. MAT 111, TME 220

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

TME 231 Technical Mechanics

This course provides students with the concepts and skills required to apply the principles of mechanics for the solution of problems commonly encountered in the fields of drafting and design mechanical and automated manufacturing and robotics technologies.

Upon successful completion of this course, students should be able to:

- Review force systems using free bodies in equilibrium.
- Solve friction problems for wedge, belt, rolling and bearing systems.
- Review the center of gravity and moment of inertia for distributed area and mass systems.
- Describe motion of a particle or ridged body.
- Analyze simple systems subjected to impulse and momentum.
- Calculate work, energy and power during mechanical operations.

Prereq. MAT 110 and PHY 100

4 Credits 3 Weekly Lecture Hours 2 Weekly Laboratory Hours

TME 232 Robotic Systems

Offered as a continuation of Robotics and Programmable Logic Controllers (TME 220) this course provides instruction in robotic work-cell development and applications. This course focuses on the application of robots and manufacturing automation systems. Cell layout, documentation, programming and the integration of sensory feedback systems to monitor a control process within a manipulative and transporting system are stressed.

Upon successful completion of this course, students should be able to:

- Analyze the processes and operations involved and prepare a plan for the layout and integration of various components within a robotic work cell.
- Read and create drawings, circuits and logic diagrams applicable to installing, interfacing, programming and repairing automated systems.
- Describe the basic function of a sensory monitoring/feedback system and discuss the concepts involved for accomplishing system interfacing, and system control.
- Perform off-line programming functions for Robotic and Programmable Logic Controllers (PLC) devices.
- Monitor the performance of a PLC microprocessor/computer automated system.
- Interact with supervisory personnel and assist with the installation of a programmable automated system.

Prereq. TME 220

3 Credits 2 Weekly Lecture Hours 2 Weekly Laboratory Hours

TME 290 Fluid Mechanics

3 Credits 3 Weekly Lecture Hours
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