DESCRIPTION OF COURSES

Internships, independent study, special topics and work experience are special options offered in each discipline. See their activity descriptions. Students seeking any of these options should meet and discuss the choice with the respective faculty.

****You may meet this prerequisite based on your course placement, ACT score or successful college coursework. Visit our web site for current assessment options and requirements.***

ACCOUNTING (ACC)

ACC 115 Payroll Accounting (2 CR)
Accurate payroll records and timely payroll tax reporting are critical elements for all successful businesses. Learn to apply payroll accounting rules and procedures to support business operations. Learn employment and tax laws that affect payroll preparation. Learn the skills, procedures, and concepts necessary to compute a company's payroll. Topics include hiring, gross pay, FICA taxes, income taxes, employee deductions and benefits, payroll accounting, earnings records, tax deposits, unemployment taxes, recording payroll transactions, Form 940EZ, Form 941, reporting employee earnings and special situations.
Prerequisites: ENG 085* and ENG 090*

ACC 122 Volunteer Income Tax Project (3 CR)
Students will assist Jackson area targeted and elderly populations with income tax preparation. Working with both the Jackson Community Action Agency and the Internal Revenue Service, students will train and test to become VITA tax preparers. Training will occur during January, fieldwork will take place through April 15 and coursework will wrap up during the remainder of April. Previous computer experience is strongly recommended.

ACC 130 QuickBooks Pro (2 CR)
Today nearly all businesses rely on computer software to facilitate the accounting process. Learn to use the many features of this popular and sophisticated small business computerized accounting system. Topics include customizing the system to your business, invoicing, statements, collections, bill paying, general ledger, budgeting, and tax reports.
Prerequisite: ACC 211 or higher

ACC 211 General Accounting (4 CR)
This course is designed for professionals who will be involved in the day to day recording and maintenance of sound financial records. Learn the fundamentals and mechanics of accounting needed to give an overall picture and understanding of the field of accounting. This is an introductory accounting course required in the MOA program. This course is not a prerequisite to ACC 216 or ACC 231. Students should consider their academic program and select ACC 211, ACC 216 or ACC 231 for their introductory accounting course.
Prerequisites: ENG 085*, ENG 090*, and MTH 098* or higher

ACC 214 Income Tax Accounting (3 CR)
Federal income tax for personal and business use. Concepts covered include taxable income, deductions, exclusions, exemptions and credits against the tax. Proprietorship tax returns including account and depreciation methods, self-employment taxes, self-employed retirement plans, capital gains and losses, disposition of property (both personal and business) and estimated tax declaration.
Prerequisites: MTH 098* or higher

ACC 216 Financial Accounting Concepts (4 CR)
This course is designed for the non-accounting supervisor/manager who must have an understanding of financial and managerial accounting as it is used in decision making. Learn about annual reports, financial statements, balance sheet accounts and accounting transactions. Focus on how accounting information is used in decision making and not on the mechanics behind that accounting information. This is an introductory accounting course required for some BUA and CIS programs. Students should consider their academic program and select either ACC 211, ACC 216 or ACC 231 for their introductory accounting course.
Prerequisites: ENG 085* and ENG 090*

ACC 231 Principles of Accounting I (4 CR)
This course is designed for business and accounting majors or the transfer student. Learn the theory and practice of recording accounting data and preparation of financial statements in accordance with Generally Accepted Accounting Principles (GAAP) with an emphasis on sole proprietorships. Current software will be utilized and previous computer experience is strongly recommended. This is an introductory accounting course required for some BUS and all ACC majors. Students should consider their academic program and select ACC 211, ACC 216 or ACC 231 for appropriate introductory accounting course. Success in this class depends upon strong analytical problem solving skills, basic computer skills and your dedication.
Prerequisites: ENG 085*, ENG 090*, and MTH 098* or higher

ACC 232 Principles of Accounting II (4 CR)
This course is designed for business majors, accounting majors, and transfer students. Learn the aspects of accounting unique to corporations followed by an introduction to managerial decision making and uses of accounting data utilizing current software. Topics include stocks, bonds, cash flow, cost accounting, break-even analysis, differential analysis, financial statements and budgeting. **Prerequisite: ACC 231**

ACC 234 Managerial Accounting (4 CR)
Management level professionals from all disciplines will be faced with complex situations and decisions. Appropriate managerial accounting reports and critical thinking skills are crucial to a pro-active management process. Learn about financial statement analysis, cash flow forecasting, job order costing in manufacturing, process costing in manufacturing, activity based costing in manufacturing, cost-volume analysis, cost behavior analysis, budgeting, responsibility accounting, case study analysis, critical thinking and decision making skills. **Prerequisite: ACC 232**

ACC 240 Intermediate Accounting (4 CR)
Professional accountants must have a solid background in GAAP financial accounting concepts. Review and expand your knowledge of accounting theory and processes, nature and content of the balance sheet and income statement, present value tables and their application, currently applicable General Accepted Accounting Principles (GAAP) and recent Financial Accounting Standards Board (FASB) pronouncements.
Prerequisite: ACC 232

ACC 245 Accounting Internship (3 CR)
Gain valuable work experience in an accounting position. The position must be obtained by the student in coordination with a faculty member and approved by the department before the semester begins.

AVIATION FLIGHT TECHNOLOGY (AFT)

AFT 055 The Right Seat (0.33 CR)
Designed for the spouse or friend of the licensed pilot to become familiar with communication, navigation, and basic flight procedures necessary to assist an ill or incapacitated pilot.

AFT 100 Basic Maneuvers (2 CR)
Ground instruction relating to in-flight maneuvering. Explains the theory and proper execution of ground and flight maneuvers required for Primary Flight.

AFT 110 Primary Ground School (3 CR)
Preparation for the FAA Private Pilot written examination by classroom work on federal aviation regulations, air space, meteorology, navigation, communication and aerodynamics.

AFT 115 Primary Flight I (4 CR)
20 hours of flight prepares the student for solo flight with 15 hours of dual instruction and five hours of solo flight. Includes preflight, start-up, radio communication, taxi, basic flight maneuvers, takeoffs, landings, etc.

AFT 120 Primary Flight II (4 CR)
30 hours of flight prepares the student for the Private Pilot Certificate with 15 hours of dual and 15 hours of solo flight to include solo cross-country, night and basic instrument training.
Prerequisite: AFT 115

AFT 125 Commercial Ground School (3 CR)
Prepares the student for the FAA Commercial Pilot written examination. In-depth study of meteorology, Federal Aviation regulations, aircraft systems, airspace, aerodynamics, etc.

AFT 130 Commercial Flight I (4 CR)
Initial flight training leading to the Commercial Pilot Certificate with instrument rating. Advanced flight training includes chandelles, lazy 8s, pylons 8s, along with basic instrument techniques.
Prerequisite: AFT 120

AFT 135 Instrument Ground School (3 CR)
Prepares the student for the FAA Instrument Pilot written examination through study of federal aviation regulations, A/C systems, meteorology, IFR departure, en route and arrival procedures. **Prerequisite: AFT 120**

AFT 140 Commercial Flight II (4 CR)
Continuation of advanced and instrument flight training including night, basic instrument procedures, navigation, and cross-country flight. Also includes introduction to complex aircraft. **Prerequisite: AFT 130**

AFT 200 Commercial Flight III (4 CR)
Continuation of advanced and instrument flight procedures with emphasis on high-performance maneuvers, solo cross-country and dual instrument en route and approach procedures.
Prerequisite: AFT 140

AFT 205 Commercial Flight IV (4 CR)
Culmination of the commercial/instrument curriculum with requirements completed for Commercial Pilot Certificate with Instrument Rating in the complex aircraft. **Prerequisite: AFT 200**

AFT 210 Instrument Flight (4 CR)
Designed for the non-commercial pilot, includes all phases of instrument flight including basic instrument, departure, en route and arrival procedures. **Prerequisite: AFT 135**

AFT 215 Flight Instructor Theory (3 CR)
Preparation for completion of the two FAA written examinations for Flight Instructor-Airplane. Covers theory of instruction and analysis of flight maneuvers from the perspective of the instructor.
Prerequisite: AFT 205

AFT 220 Flight Instructor Flight (3 CR)
Preparation for the Flight Instructor-Airplane Certificate through effective techniques of lesson planning, teaching methods, and analysis of maneuvers. **Prerequisite: AFT 205**

AFT 230 Instrument Flight Instructor Flight (3 CR)
Preparation of materials and teaching methods, analysis of maneuvers and instruction in flight instructor responsibilities. **Prerequisite: AFT 215**

AFT 235 Flight Transition (2 CR)
Provides the licensed pilot with the opportunity to develop the knowledge, experience, and flight skills needed for transition to the complex single-engine aircraft.

AFT 240 Biennial Flight Review Clinic (1 CR)
Provides the flight review necessary for FAA biennial requirements. Includes ground and flight review appropriate to the certificate or rating held by the student.

AFT 250 IFR Recurrency (1 CR)
Designed for the instrument pilot in need of recurrent training. Satisfies FAR Part 61 requirement for recent IFR experience. Student may utilize simulator, aircraft or both.

AFT 260 Multi-Engine Flight (1 CR)
Covers flight techniques and operational procedures of multi-engine airline aircraft.
Prerequisite: AFT 210

AFT 270 Practical Application (1 CR)
Allows the licensed pilot (private or better) to proceed dual, solo or with passengers, in a directed extension of the learning experience.
Prerequisite: AFT 120

AFT 275 Maintenance for Pilots (2 CR)
Pilot-owner oriented procedures for legal self-maintenance of aircraft. Considerable hands-on experience detailing preventative maintenance, inspection and repair of aircraft. Contains a review of federal aviation regulations, documents and standard practices pertaining to pilot-owner maintenance.

ANTHROPOLOGY (ANT)

ANT 131 Cultural Anthropology (3 CR)
This introduction to anthropology presents cultures from all continents, highlighting major lifestyles and illustrating human adaptation to environment from the beginnings of the human species to the present. The course focuses on the thesis that every society is based on an integrated culture, which satisfies human needs and facilitates survival.
Prerequisite: ENG 085*

ART

ART 101 Two-Dimensional Design (3 CR)
Students will learn the principles and elements of 2-D design and practice their application in a variety of hands-on studio projects. Critical thinking skills such as problem solving, understanding the creative process (from idea to finished product), and addressing visual and conceptual themes are essential parts of the course. These skills are reflected in studio projects.

ART 103 Drawing I: Foundations (3 CR)
This course introduces basic drawing principles and techniques in a studio setting. Students explore contour and tonal drawing using various subjects and media in both observational and conceptual drawings. Projects will incorporate a variety of ability levels, as well as traditional and non-traditional media (including digital images). Students will draw from a nude model. Critical thinking skills such as problem solving, understanding the creative process (from idea to finished product), and addressing visual and conceptual themes are essential parts of the course, reflected in the studio projects. An end of semester portfolio represents students' growth and artistic development.

ART 111 Art History: Prehistoric to 1400 (3 CR)
This course is a survey of art history and aesthetics covering art and architecture from prehistoric times to 1400. **Prerequisite: ENG 085***

ART 112 Art History: Renaissance to Present (3 CR)
This course is a survey of art history and aesthetics covering art from the Renaissance through the 20th century. **Prerequisite: ENG 085***

ART 121 Ceramics I: Foundations (3 CR)
A general overview of ceramics that focuses on a variety of hand building techniques as well as wheelwork and finishes.

ART 122 Ceramics II: Wheel & Ceramic Sculpture (3 CR)
This course allows the advanced students an opportunity for further work on wheel produced production pieces, as well as exploring the possibilities of sculpture created with ceramic materials. Advanced finishing and firing techniques will also be considered. **Prerequisite: ART 121**

ART 131 Visual Arts Education (3 CR)
Students explore theories and philosophies of art education with an emphasis on elementary school children's artistic development and 'hands-on' studio art projects. Students study the history of art, aesthetics, and art production with a focus on student diversity and multicultural connections and its incorporation in the classroom. Service learning and other fieldwork opportunities are key parts of the course. No prior art experience necessary.

ART 137 Digital Photography (3 CR)
(SAME AS CIS 137)
This course provides the necessary information and assistance in using a digital camera to capture, edit and manipulate top quality images for both the Internet and printing. Includes techniques on layout, composition, message and color. Students supply their own camera.

ART 152 Painting I: Design & Color (3 CR)
The elements and principles of design and color are introduced to create basic painting composition in a studio setting. Emphasis is given to techniques using acrylics and/or watercolor media. Critical thinking skills such as problem solving, understanding the creative process (from idea to finished product), and addressing visual and conceptual themes are essential parts of the course, reflected in the studio projects. Students will paint from a nude model. Gallery trips, as well as other field experiences are key aspects of this course. Students work with the instructor to mount an end of semester exhibition, showcasing their artistic growth and development.
Prerequisite: ART 103

ART 201 Three-Dimensional Design: Shapes & Space (3 CR)
Students learn the principles and elements of 3-D design and study how to apply them in a variety of studio projects. Students understand and demonstrate the different construction methods needed to create sculpture with a diverse array of media. Critical thinking skills such as problem solving, understanding the creative process (from idea to finished product), and addressing visual and conceptual themes are essential parts of the course. These skills are reflected in studio projects.

ART 205 Drawing II: Figure & Composition (3 CR)
Students learn the elements and principles of drawing from life, with the emphasis on basic anatomy and advanced compositional elements. Projects incorporate advanced techniques and non-traditional media in a studio setting. Students will draw from a nude model. Critical thinking skills such as problem solving, understanding the creative process (from idea to finished product), and addressing visual and conceptual themes are essential parts of the course. These skills are reflected in studio projects.
Prerequisite: ART 103

ART 252 Painting II: The Figure (3 CR)
Student work will primarily involve paintings from a nude model in a studio setting. Students extend previous learning by solving problems dealing with complex compositional and color painting in a variety of situations. The development of a personal style and a culminating portfolio of work are emphasized. **Prerequisite: ART 152**

AUTOMOTIVE SERVICE TECHNOLOGY (AUT)

AUT 099 Jammin Custom Cars (2 CR)
This course is designed for gear heads that want to work on their own car. This includes tuners, drag racers, pro-street, street rod, and other high performance custom cars. This class has an open structure depending on the projects that student would like to work on. This could include installing high performance sound equipment, power-adders, ground effects, wings, sun roofs, lowering kits, headers, lighting kits, or fabricate a car. This is not a preventative maintenance class; refer to AUT 101 General Service.

AUT 101 General Service (2 CR)
This course is designed for those who wish to explore the automotive service technician occupation. Introductory exposure to the various service areas is provided, along with student participation of various service tasks.

AUT 102 Engine Performance I (4 CR)
A comprehensive study including hands-on repair of the automobile's ignition and emission systems. Service procedures include scope analysis, compression testing, cylinder leak-down testing, component testing with digital multimeters and lab scopes, tune-up, and troubleshooting of the various systems. The combination of AUT 102 & 103 prepares the student with job skills for entry into the workforce and the knowledge for successfully completing the Michigan or ASE certification examinations required for mechanic licensing.
Prerequisites: ENG 085*and MTH 098*

AUT 103 Engine Performance II (4 CR)
A comprehensive study including hands-on repair of the automobile's fuel and computerized engine control systems. Service procedures include fuel pressure testing, fuel injector testing, exhaust gas analysis, scan tool usage, component testing with digital multimeters and lab scopes, and

troubleshooting of the various systems. The combination of AUT 102 & 103 prepares the student with job skills for entry into the workforce and the knowledge for successfully completing the Michigan or ASE certification examinations required for mechanic licensing. Students are required to take the Michigan certification test as an integral part of the course. **Prerequisite: AUT 102**

AUT 105 Automotive Brakes (3 CR)
A comprehensive study including hands-on repair of the automobile's braking systems. Service procedures include drum brake service, disc brake service, machining drums and rotors, parking brake service, hydraulic system repair, anti-lock brake system service, and troubleshooting the various systems. This course prepares the student with job skills for entry into the workforce and the knowledge for successfully completing the Michigan or ASE certification examinations required for mechanic licensing. Students are required to take the Michigan certification test as an integral part of the course. **Prerequisites: ENG 085*, MTH 095*, AUT 101 and AUT 234**

AUT 106 Suspension & Steering (3 CR)
A comprehensive study including hands-on repair of the automobile's steering and suspension systems. Service procedures include pre-alignment inspections, four-wheel alignment, conventional suspension & steering systems, McPherson strut service, rack & pinion steering service, component replacement, and troubleshooting the various systems. This course prepares the student with job skills for entry into the workforce and the knowledge for successfully completing the Michigan or ASE certification examination required for mechanic licensing. Students are required to take the Michigan certification examination as an integral part of the course.
Prerequisites: ENG 085*, MTH 095*, AUT 101 and AUT 234

AUT 108 Automotive Air Conditioning & Heating (3 CR)
A comprehensive study including hands-on repair of the automobile's air conditioning and heating systems. Service procedures include cooling system service, refrigeration system service, control system repair, heater service, component testing, environmental issues (the ASE Refrigerant and Recovery Certification test is included and required), and troubleshooting the various systems. This course prepares the student with job skills for entry into the workforce and the knowledge for successfully completing the Michigan or ASE certification examination required for mechanic licensing. Students are required to take the Michigan certification test as an integral part of the course. **Prerequisites: ENG 085* and MTH 095***

AUT 112 Electrical Systems I (3 CR)
A comprehensive study including hands-on repair of the automobile's electrical system. Service procedures include basic electrical testing using test lights and multimeters, reading basic electrical schematics, battery service, starter service, alternator service, and troubleshooting the various systems. The combination of AUT 112 and 113 prepares the student with job skills for entry into the workforce and the knowledge for successfully completing the Michigan or ASE certification examination required for mechanic licensing. **Prerequisites: ENG 085*and MTH 098***

AUT 113 Electrical Systems II (3 CR)
A comprehensive study including hands-on repair of the automobile's electrical system. Service procedures include basic electronics testing using digital multimeters, advanced electrical schematics, chassis wiring, lighting circuits, instrumentation, power seats, power windows, wiper systems, air bag systems, electrical accessories, and troubleshooting the various systems. The combination of AUT 112 and 113 prepares the student with job skills for entry into the workforce and the knowledge for successfully completing the Michigan or ASE certification examination required for mechanic licensing. Students are required to take the Michigan certification test as an integral part of the course. **Prerequisite: AUT 112**

AUT 118 Diesel Fundamentals (2 CR)
This course is designed for those who wish to explore modern automotive and light truck diesel engines. This will include a study of diesel operating principles, fuel systems, engine construction, sub-systems, diesel maintenance, and diagnosis. Shop time will include disassembly, exploration, and reassembly of compact diesel engines. **Prerequisites: ENG 085* and MTH 095***

AUT 119 Introduction to Alternate Fuels (2 CR)
Students will use various sources in the alternative fueled vehicle industry to learn what alternative fuels are available. Students will closely examine the technologies involved when using compressed gas (CNG) as a fuel for vehicles.

AUT 201 Engine Repair (4 CR)
A comprehensive study including hands-on repair of the automobile engine. Service procedures include cooling system repair, lubrication system repair, intake systems repair, exhaust repair, engine testing, engine replacement, engine disassembly, cleaning and measurement, cylinder head reconditioning, block reconditioning, machining operations, assembly techniques, and troubleshooting the various systems. This course prepares the student with job skills for entry into the workforce and the knowledge for successfully completing the Michigan or ASE certification examination required for mechanic licensing. Students are required to take the Michigan certification test as an integral part of the course. **Prerequisites: ENG 085* and MTH 095***

AUT 202 Automatic Transmission (4 CR)
A comprehensive study including hands-on repair of automatic transmissions and transaxles. Service procedures include basic transmission service, transmission pressure testing, scan tool testing, transmission assembly replacement, transmission disassembly, inspection of parts, transmission reassembly, and troubleshooting the various systems. This course prepares the student with job skills for entry into the workforce and the knowledge to successfully complete the Michigan or ASE certification examination required for mechanic licensing. Students are required to take the Michigan certification test as an integral part of the course. **Prerequisites: ENG 085*, MTH 095*, AUT 101 and AUT 234**

AUT 203 Advanced Engine Performance (2 CR)
Covers general power train diagnosis, computerized power train diagnosis (including OBD II), ignition system diagnosis (including scope analysis), fuel and air induction diagnosis (including 5-gas analysis), emission control systems diagnosis, and I/M failure diagnosis. Students who successfully complete this course will be ready to take the ASE L-1, Auto Advanced Engine Performance Specialist Exam. **Prerequisites: AUT 102, AUT 103, AUT 112 and AUT 113**

You may meet this prerequisite based on your course placement, ACT score or successful college coursework. Visit our web site for current assessment options and requirements.

AUT 204 Manual Transmissions & Drivelines (3 CR)
A comprehensive study including hands-on repair ofmanual transmissions, manual transaxles, and drivelines. Service procedures include transmission service, clutch overhaul, half-shaft repair, drive-shaft repair, differential service, axle repair, and troubleshooting the various systems. This course prepares the student with job skills for entry into the workforce and the knowledge to successfully complete the Michigan or ASE certification examination required for mechanic licensing. Students are required to take the Michigan certification test as an integral part of the course. **Prerequisites: ENG 085*, MTH 095*, AUT 101 and AUT 234**

AUT 205 Toyota Fast-Track (8 CR)
This course is designed for existing Toyota technicians, Michigan licensed technicians, and ASE certified technicians that desire basic Toyota training. The topics include brakes, steering & suspension, climate control, electrical systems, engine performance, manual transmissions & drivelines, and automatic transmissions. Successful completion will certify the students in the basic Toyota skill level guidelines.
Prerequisite: Instructor Permission Required

AUT 210 Co-op Experience (4 CR)
This co-op experience is paid on-the-job training. It prepares the student to acquire hands-on job skills and work habits in conjunction with the student's employment site. The student will work at a sponsoring repair shop or dealership approximately three days a week (or to be arranged with instructor's approval) performing a variety of automotive repairs. Visits by the school supervisor provide the basis for evaluation. Students are required to complete a total of one co-op experience in the associate degree program.

AUT 211 Co-op Experience (4 CR)
This co-op experience is paid on-the-job training. It prepares the student to acquire hands-on job skills and work habits in conjunction with the student's employment site. The student will work at a sponsoring repair shop or dealership approximately three days a week (or to be arranged with instructor's approval) performing a variety of automotive repairs. Visits by the school supervisor provide the basis for evaluation. Students are required to complete a total of one co-op experience in the associate degree program.

AUT 212 Co-op Experience (4 CR)
This co-op experience is paid on-the-job training. It prepares the student to acquire hands-on job skills and work habits in conjunction with the student's employment site. The student will work at a sponsoring repair shop or dealership approximately three days a week (or to be arranged with instructor's approval) performing a variety of automotive repairs. Visits by the school supervisor provide the basis for evaluation. Students are required to complete a total of one co-op experience in the associate degree program.

AUT 214 Auto Lab Experience (4 CR)
Structured lab time to work on auto repair projects in which students have completed coursework and want to expand their knowledge and skills in specific areas previously not covered. May be used as an internal co-op. **Prerequisites: Choose one of the following - AUT 102, AUT 103, AUT 105, AUT 106, AUT 108, AUT 112, AUT 113, AUT 201, AUT 202 or AUT 204**

AUT 234 Undercar Service (2 CR)
This course will provide training in MIG welding, exhaust pipe bending and oxyacetylene cutting procedures. This class is designed to prepare the students to pass the ASE XI Specialist Test: Exhaust Systems.

AUT 240 Hybrid Technology (2 CR)
This course will introduce students to hybrid technology through a combination of classroom and lab experiences. Topics include safety procedures when working on the high voltage systems, understanding the various warning lights, understanding normal operation and diagnosis of the various high voltage systems. Lab will include hands-on activities on a hybrid vehicle.
Prerequisites: AUT 102, AUT 103, AUT 112 and AUT 113

AUT 248 Diesel Engine Performance (2 CR)
This course is designed to provide an in-depth study of the compact diesel fuel and emission systems. This will include the study of diesel fuel, diesel fuel supply systems, high pressure mechanical and electronic fuel injection systems, computerized engine controls, exhaust gas recirculation valves, exhaust emissions, and soot particle reduction. Shop time will include using diesel fuel systems simulators, scan tool usage for diagnosis of fuel and emission system problems, and work on a diesel powered pick-up truck.
Prerequisite: AUT 118

BIOLOGY (BIO)

BIO 110 Introductory Biology (4 CR)
Students will investigate the nature of science and apply principles of evolution, ecology, molecular and cellular biology to analyze scientific data and current biological issues. This course is designed for non-science majors. This course includes a laboratory component. **Prerequisites: ENG 085*, ENG 090* and MTH 098**

BIO 131 General Biology (4 CR)
Students survey the basic biological principles that regulate the structure and function of cells; the production and use of energy; the genetic, environmental and evolutionary influences on organisms; and the interrelationships between organisms and their environment. Course includes a laboratory component. **Prerequisites: ENG 085*, ENG 090* and MTH 098**

BIO 132 Human Biology (4 CR)
Students focus on the structure and function of the human body, the unity and diversity of life, the nature of scientific inquiry, and the principles and processes of evolution as well as contemporary issues that relate to biology. Course includes a laboratory component.
Prerequisite: ENG 085*

BIO 151 General Botany (4 CR)
Emphasizes the development, anatomy, physiology and evolution of angiosperms. A survey of the plant kingdom with representative life cycles stresses relationships among plant groups. A strong biology background or instructor permission required. Course includes a laboratory component.
Prerequisite: ENG 085*

BIO 152 General Zoology (4 CR)
A comparative study of the anatomical and evolutionary relationships of the major animal phyla with emphasis on development, structure and function of vertebrate systems. Course includes a laboratory component. **Prerequisite: BIO 131**

BIO 155 Human Anatomy & Physiology (5 CR)
A lecture and laboratory course in the anatomy and physiology of the human body. Study begins with introductions to basic terminology and cell structure, then extends to a survey of the organ systems. Laboratory study enhanced via microscopic study of tissues, the examination of preserved specimens and anatomic models, the use of interactive anatomy and physiology computer

models, and cat dissection. A strong biology background, Biology 132, Medical Terminology or Body Structure and Function is recommended.
Prerequisites: ENG 085* and MTH 098*

BIO 220 Microbiology (4 CR)
Basic structure and function of microorganisms with special emphasis on recent advances in microbiology, pathogens, disease, control and immunity. Strong biology background recommended. Course includes a laboratory component.
Prerequisites: ENG 085*and MTH 098*

BIO 253 Human Anatomy and Physiology I (4 CR)
This is the first course of a two semester course sequence in which students study the anatomy and physiology of the human body. The course includes introductions to basic chemistry, biology and histology and extends to the survey of the integumentary, skeletal, muscular and nervous systems. This course includes a laboratory component in which students are responsible for performing dissections and making original observations on dissected material. The laboratory experience culminates with the use of a plastinated human specimen for observation. A strong background in biology and/or chemistry is highly recommended.
Prerequisites: ENG 085*and MTH 098*

BIO 254 Human Anatomy & Physiology II (4 CR)
This is the second course of a two semester course sequence in which students study the anatomy and physiology of the human body. The course includes the autonomic nervous system, sensory, motor, and integrative systems, special senses, endocrine system, cardiovascular systems, lymphatic system and immunity, respiratory systems, digestive system, metabolism and nutrition, urinary system and reproductive systems. This course includes a laboratory component in which students are responsible for performing dissections and making original observations on dissected material.
The laboratory experience culminates with the use of a plastinated human specimen for observation. A strong background in biology and/or chemistry is highly recommended.
Prerequisite: BIO 253

BUSINESS (BUA)

BUA 084 How to Build High Performance Teams (1 CR)
This course will introduce the student to what constitutes high performance teams. The student will be introduced to how to build and manage high performance teams moving them toward their goals.

BUA 085 What Managers Do (1 CR)
The student will learn the development of contemporary management and the managerial functions of planning, organizing, staffing, motivating, leadership and control.

BUA 086 A Manager's Guide to Human Behavior (1 CR)
The student will learn to enhance organizational effectiveness and facilitate change by better understanding individual's personal styles.

BUA 087 Communication Skills for Managers (1 CR)
The student will learn clear and precise business communication techniques for both written and oral communications. The student will also learn to utilize these techniques for both individual and group communication situations.

BUA 088 Managing & Achieving Organizational Goals (1 CR)
The student will learn to utilize various goal-setting criteria to create an action plan, track goals and trouble shoot problems to ensure the success of the organizational goals.

BUA 089 How to Manage Conflict in the Organization (1 CR)
The student will learn that conflict is neither negative nor positive and, in fact, can be beneficial for the growth and development of an organization. The student will examine both structural and interpersonal conflicts and explore a variety of techniques for their resolution.

BUA 100 Contemporary Business (3 CR)
As business speeds into the 21st century, new techniques, population shifts, and shrinking global barriers are altering the world at a frantic pace. Learn about the range of business careers available and the daily decisions, tasks and challenges that they face. Emphasis is placed upon developing a vocabulary of business terminology, teamwork, quality, social responsibility and cultural diversity. Understand how management, marketing, accounting, and human resource management work together to provide ethical competitive advantages for firms. This knowledge can help you enhance your career potential.
Prerequisites: ENG 085*and ENG 090*

BUA 110 Introduction to Wall Street (1 CR)
Designed to help existing or potential investors keep abreast of investment opportunities in today's changing financial world. Students are taught the mechanics of investing, how to analyze risk and return, and strategies to making sound investment decisions related to the stock market. The organization and function of the stock market, brokerage firms, and financial information on the Internet are examined.
Prerequisite: MTH 095* or higher

BUA 111 Personal Finance (3 CR)
Provides a fundamental knowledge of financial concerns including financial services, stocks, bonds, budgeting, insurance, real estate, estate and tax planning, buying on credit, borrowing, saving, investing intelligently, and retirement. Analysis of personal objectives to financial planning will be discussed and put into practice.

BUA 120 Human Relations in Business (3 CR)
Effective human relations are an indispensable tool in developing a successful professional presence in today's world. Topics include self-understanding, as well as the understanding of others, motivation, productivity, morale, conflict and change, stress, ethics, diversity, goal setting, the power of positive reinforcement, image building, emotional control, assertiveness, effective communication and different leadership styles.

BUA 121 Leadership (3 CR)
Both knowledge and behavior contribute to effective leadership skills needed to enhance the contribution of your team. Students explore topics including shared vision and values, team building, and decision making. You will study leadership theory in ways that encourage development of your leadership skills, including effective use of power and influence, motivational tools, personality assessment, team communication, role modeling, and performance appraisals.
Prerequisite: ENG 085*

BUA 122 Successful Small Business (3 CR)
Do you have what it takes to own your own business? Discover that, as well as sources of financing, forms of legal ownership, niche marketing, and most importantly, how to avoid business failure.
Prerequisite: ENG 085*

BUA 130 Customer Service (3 CR)
In the face of change, an uncertain economy, and intensive competition, the student will learn how to create an unexpected, highly evolving experience, to create customer loyalty and compelling word of mouth customers. The core element of service quality will be applied to both people-centered and technology-centered businesses, industries and organizations. The ultimate goal of this course is to help improve students' abilities to communicate effectively with internal and external customers.

BUA 131 Effective Selling (3 CR)
This class covers that basic fundamentals of selling, adaptable to any product or potential customer. Skills learned include satisfying customer needs, recognizing individual motives for purchase, sales psychology, business etiquette and developing a long-term consultative relationship with customers. Persuasive sales presentations are developed and delivered using the steps of the selling process.
Prerequisite: ENG 085*

BUA 220 Principles of Management (3 CR)
This management course exposes students to the dynamics of the changing world. Topics such as management functions/processes, quality, leadership styles, power, global issues, and the challenges and opportunities of diversity are included. Emphasis is placed on ethics, decision-making, effective communication, evaluating employees, motivational tools, organizational design, environmental scanning, supervising groups, controlling quality, productivity improvement, managing change and conflict, labor relations and time management.
Prerequisite: ENG 085*

BUA 221 Human Resources Management (3 CR)
Create and maintain a desirable and productive work place by applying management skills with emphasis on improving performance and career development. Topics include: employment law, recruitment and selection, placement techniques, interview methods, job analysis, staffing, training and development, performance appraisals, team building, benefit administration, government regulation, compensation systems, health and safety, and labor-management issues.
Prerequisite: ENG 085*

BUA 230 Principles of Marketing (3 CR)
Students analyze the marketplace to identify customer wants and needs and develop effective strategies to satisfy them. Emphasis is placed on research, marketing environments, strategic planning, buyer behavior, evaluating key competitors, and the marketing functions of product or service planning, pricing, promotion and distribution. **Prerequisite: ENG 085***

BUA 231 Advertising, Promotion & Public Relations (3 CR)
Students study the principles and practices of numerous promotional tools used in marketing communications. Topics include creation of advertising, media strategies, message appeals, plus the use of specialty advertising, sales promotion and public relations to help sell goods, services and ideas. **Prerequisite: ENG 085***

BUA 245 Internship (3 CR)
Students will have meaningful work experience with an appropriate company. The company and job must be approved by the supervising faculty member.

BUA 250 Business Law I (3 CR)
This course offers an introduction to law and the legal system, dispute resolution and courts, business ethics, torts, contracts, sales and leases of goods, and negotiable instruments.
Prerequisite: ENG 085*

BUA 251 Business Law II (3 CR)
The student will learn the law governing the forms of business organization, including agency, partnerships, corporations, and real and personal property. **Prerequisite: BUA 250**

You may meet this prerequisite based on your course placement, ACT score or successful college coursework. Visit our web site for current assessment options and requirements.

COMPUTER ASSISTED DRAFTING (CAD)

CAD 131 Computer Assisted Drafting I (AutoCAD) (3 CR)
Course on the applications in which the phases of computer graphics are involved. A general introduction to drafting applications will be presented. Recommended: Windows® and blue print reading experience

CAD 132 Computer Assisted Drafting II (AutoCAD) (3 CR)
This course is a continuation of Computer Assisted Drafting I; a more advanced application of drafting functions and skills will be presented.
Prerequisite: CAD 131

CLIMATE CONTROL TECHNOLOGY (CCT)

CCT 117 Basic Sheet Metal (2 CR)
This course will teach methods and formulas necessary to shop fabricate the most common straight duct and fittings used in the HVAC industry. **Prerequisite: ENG 085***

CCT 118 Advanced Sheet Metal (2 CR)
This course will teach advanced methods and formulas necessary for transitional and round shop fabrication of duct fittings for the commercial HVAC industry. **Prerequisite: CCT 117**

CCT 121 Introduction to HVAC (3 CR)
The course will introduce the student to a variety of professions and work opportunities in the HVAC field. Students will also review the tools of the trade, safety practices, a basic introduction to components of heating and air conditioning equipment, heat transfer, psychometrics and air quality. **Prerequisite: ENG 085***

CCT 123 Application of HVAC Technology (3 CR)
The student will be taught to calculate heat loss and heat gain for residential and small commercial buildings, design duct distribution systems, and choose properly sized heating and air conditioning equipment. Recommended: basic knowledge of heating and air conditioning vocabulary.
Prerequisite: CCT 121

CCT 131 Basic HVAC Electrical/Controls (2 CR)
This course will cover the characteristics of basic electrical circuitry and low voltage control wiring, as well as electrical formulas and applications. Recommended: basic knowledge of heating and air conditioning vocabulary.
Prerequisites: ENG 085* and CCT 121

CCT 135 Basic Refrigeration & Air Conditioning I (3 CR)
This course will cover standard components, operational sequences, troubleshooting and repair of refrigeration and air conditioning equipment. Recommended: basic knowledge of heating and air conditioning vocabulary. **Prerequisite: CCT 121**

CCT 136 Basic Refrigeration & Air Conditioning II (3 CR)
This course will cover advanced compenents, operational sequences, troubleshooting and repair of refrigeration and air conditioning equipment.
Prerequisite: CCT 135

CCT 137 Advanced HVAC Electrical/Controls (2 CR)
This course will cover characteristics of advanced electrical circuitry and low voltage control wiring, as well as electrical formulas and applications.
Prerequisite: CCT 131

CCT 141 Basic Heating (2 CR)
This course will cover standard components, operational sequences, troubleshooting, and repair of gas and oil heating equipment. Recommended: basic knowledge of heating and air conditioning vocabulary. **Prerequisite: CCT 121**

CCT 142 Advanced Heating (2 CR)
This course will cover advanced components, operational sequences, troubleshooting and repair of heating equipment. **Prerequisite: CCT 141**

CCT 200 Mechanical Code (2 CR)
This course covers local and national laws governing the installation of HVAC equipment and system components. Students should take in last semester.

CCT 201 Refrigeration Certification (1 CR)
This course will cover the characteristics of and laws pertaining to the handling, installing and recovering of freons. Successful completion of this course will earn the student the required certification to legally purchase and use freon.
Prerequisite: CCT 135

CHEMISTRY (CEM)

CEM 131 Fundamentals of Chemistry (4 CR)
Fills requirement for some non-science majors. Provides background for CEM 141 for those with no recent high school chemistry. Fundamental principles of chemistry such as states of matter, simple atomic and molecular structure, and the periodic classification of elements. The study of water emphasizes the properties of solutions and acid-base relations. Course includes a laboratory component.
Prerequisites: ENG 085* and MTH 120* or higher

CEM 132 Fundamentals of Organic & Biological Chemistry (4 CR)
This course is an extension of material covered in CEM 131. It is required in many bachelor's degree programs, including nursing. Organic topics include the structure, physical properties and chemical behavior of the major classes of organic compounds. The structure, function, formation and reactions of carbohydrates, fats, proteins, and nucleic acids are covered, including enzymes, chemical messengers, and biochemical energy production. Course includes a laboratory component. **Prerequisite: CEM 131 or CEM 137**

CEM 137 Chemistry of Life (4 CR)
(FORMERLY CEM 121)
This course is designed to meet the chemistry requirement for the ADN nursing program. It introduces the fundamental principles of general chemistry (structure of atoms and compounds, states, energy, equations, radioactivity, solutions and acids/bases), organic (structure and properties of major classes), and biochemistry (carbohydrates, proteins, lipids and metabolism). Course includes a laboratory component. Students who have not had a previous chemistry course are strongly advised to take CEM 131 prior to this course.
Prerequisites: ENG 085* and MTH 120* or higher

CEM 141 General Chemistry I (5 CR)
This course is required for most sciences, engineering, and pre-professional health majors. Students who are required to take organic chemistry for their major should enroll in CEM 141 during their first semester. Topics include atomic and molecular structure, periodicity, chemical bonding, states of matter, kinetic molecular theory and stoichiometry. Course includes a laboratory component.
Prerequisites: ENG 085* and MTH 120* or higher

CEM 142 General Chemistry II (5 CR)
This course is the second semester of general chemistry and extends material covered in CEM 141. Covered concepts include chemical thermodynamics, electrochemical reactions, reaction kinetics, acid-base theories, nuclear chemistry, and aqueous solutions with emphasis on equilibrium. Experiments include quantitative methods, stoichiometry, colorimetry, and gravimetric analysis. Course includes a laboratory component. **Prerequisite: CEM 141**

CEM 241 Organic Chemistry I (5 CR)
Comprehensive study of the major classes of organic compounds, their structures and reactions. The stero-chemical properties and spectra (IR and NMR) of molecules and their mechanisms of reactions are stressed. The laboratory experiments demonstrate techniques used in organic reactions, syntheses illustrating types of reactions, analysis of major classes of compounds and kinetic studies.
Prerequisite: CEM 142

CEM 242 Organic Chemistry II (5 CR)
A continuation of CEM 241. Course includes a laboratory component. **Prerequisite: CEM 241**

COMPUTER INFORMATION SYSTEMS (CIS)

CIS 010 Learning the Keyboard (1 CR)
Learn keyboard fundamentals for success in computer related programs. The students learn proper finger placement and key locations on a microcomputer.

CIS 011 Keyboard Speed/Accuracy (1 CR)
At course entry your keyboarding speed and accuracy is measured. A diagnosis of your specific keyboarding problem is made. Your skill improvement goals will be established and appropriate practice lessons selected. Periodic program check timings administered to measure your progress.

CIS 012 Microsoft® Windows® Workshop (1 CR)
Introduction to Windows®: the desktop, working in Windows®, customization, accessories, managing files and folders, multi-tasking, local and area networks and, when time permits, Internet interface and faxes.

CIS 013 Operating System: UNIX (1 CR)
Overview of the UNIX operating system, commands, batch files and other basic topics. Typing ability necessary to be successful in this class.

CIS 014 Internet Workshop (1 CR)
Learn to navigate the Internet and use File Transfer Protocol (FTP), Archie, Wide Area Information Servers (WAIS) and Gopher services to retrieve information from a variety of sources. Sources include library catalogs, shareware and freeware archives, government documents, newspapers, magazines, books, newsgroups, medical and legal publications and scholarly documents.

CIS 016 Microsoft® DOS® Workshop (1 CR)
Learn the IBM (or equivalent) personal computer and its components. Course covers the operating systems background, Disk Operating System (DOS®) commands, tree structure, EDLIN, Microsoft® - DOS® command files, and designing and writing simple batch files.

CIS 020 Microsoft® Word® Workshop (1 CR)
Learn to process documents using Microsoft® Word®, including letters, memos and reports. Typing ability necessary to be successful in this class.

CIS 021 Microsoft® Excel® Workshop – Windows (1 CR)
Create business applications using the Excel® spreadsheet within the Windows graphical user interface (GUI). This course covers basic commands, cell ranges, formulas, and mathematical, financial and statistical functions.

CIS 022 Microsoft® Access® Workshop (1 CR)
Learn how to create, query, maintain, present data as reports and forms, include graphs, tables and clip art in printouts, and use macros to create application systems for databases.

CIS 023 Microsoft® FrontPage® Workshop (1 CR)
Learn the following FrontPage® components: creating and managing a web site, adding a web page, editing and enhancing a web page, and building a web for user input. Typing ability necessary to be successful in this class.

CIS 024 Microsoft® Outlook® Workshop (1 CR)
Learn to use Outlook® components to create and use the calendar feature to schedule meetings and multiple day events, establish a "contacts" database, keep journals, notes and use the task manager for prioritizing jobs. This is an optional component of the Microsoft® Office® User Specialist Expert certification test. Typing ability necessary to be successful in this class.

CIS 025 Microsoft® Expression Web® (1 CR)
This course will show how to create web sites with the Microsoft® Expression Web® program. Topics will include how to create a web site, managing and publishing a web site, and how to use views, tables and frames. Previous keyboarding experience necessary to be successful in this course.

CIS 045 Web Page Design I (Dreamweaver®) (1 CR)
This course covers the fundamental concepts of web page design using Adobe® Dreamweaver®. This course will instruct students in all the basic functions of Adobe® Dreamweaver® in regards to understanding how to get a web site up and running.

CIS 100 Computer Literacy (1 CR)
An introduction to the Windows® operating system, accessing information on the Internet, mouse usage, file system information, upgrading and maintaining your PC.

CIS 101 Introduction to Computer Systems (3 CR)
Enhance computer knowledge. Course covers computer system concepts with an emphasis on several software applications. Typing ability necessary to be successful in this class. **Prerequisites: ENG 085* and MTH 098* or higher**

CIS 110 Beginning Keyboard/Typing (3 CR)
Students are introduced to the keyboard and centering, tabulation, memoranda and letters and develop skill and speed. Students learn on microcomputer using word processing.

CIS 111 Intermediate Keyboard/Typing (3 CR)
Learn production typing including tables, letters, manuscripts, reports, and business forms. Students learn on microcomputer using word processing software. Advanced word processing functions are included. **Prerequisite: CIS 110**

CIS 112 Microsoft® Office® Professional Introduction (3 CR)
Introduction and skill development in the four applications of Microsoft® Office® (Microsoft® Word®, Excel®, Access®, PowerPoint®), plus the full integration of all four packages.

CIS 119 Microsoft® PowerPoint® (2 CR)
Students will learn how to create electronic presentations using design templates, slide layouts, the outline tab, clip art, from other programs such as Microsoft® Word® and how to enhance slideshows with visual elements in presentation formats. Student will also learn how to create presentations for the web, self running presentations, presentations containing interactive documents and how to collaborate work groups. Keyboarding skills are essential.

CIS 120 Microsoft® Word® Comprehensive (3 CR)
Produce, store and revise letters, memos, tables and reports using Microsoft® Word®. Headers, footers, mail merge, document assembly, grammar and spell checker, thesaurus, and outlining are covered. Keyboarding skills are essential.

CIS 121 Microsoft® Excel® Comprehensive (3 CR)
Learn Excel® components: charts, creating workbooks, using drawing tools, formatting and auditing worksheets, functions, Internet and intranet documents, modifying and printing workbooks, ranges, database queries, importing and exporting data, macros, working with multiple workbooks, working with existing and creating new templates, and advanced workgroup functions. Keyboarding skills are essential.
Prerequisite: MTH 098 or higher

CIS 122 Microsoft® Access® Comprehensive (3 CR)
Planning, creating, and displaying databases, sorting and report preparation, data entry screens, data validation and selection, and multiple file operations. Keyboarding skills are essential.

CIS 128 Typography & Layout (3 CR)
Learn principles of type identification, selection and use in the professional rendering of comprehensive layouts. Utilization of tools, materials, and techniques of rendering emphasized.

CIS 132 Graphic Illustration (Adobe® Illustrator®) (3 CR)
Learn how to create professional looking illustrations using Adobe® Illustrator®. This course introduces student to techniques used by professional designers and illustrators.

CIS 134 Graphic Imaging (Adobe® PhotoShop®) (3 CR)
Learn the intricacies of scanning and editing images for producing practical and expressive images on a computer using Adobe® PhotoShop® software.

CIS 136 Integrated Design I (Adobe® InDesign®) (3 CR)
Learn the basics of desktop publishing using Adobe® InDesign®. Students use computers and laser printers to create professional-looking publications that incorporate illustrations and bitmap graphics.

CIS 137 Digital Photography (3 CR)
(SAME AS ART 137)
This course provides the necessary information and assistance in using a digital camera to capture, edit and manipulate top quality images for both the internet and printing. Includes techniques on layout, composition, message and color. Students supply their own camera.

CIS 143 HTML (2 CR)
Create web pages using HTML. Students will learn techniques and strategies to build and promote successful web pages. Features such as columns, frames, image maps, and META tags will be covered in this course.

CIS 145 Web Page Design II (Dreamweaver®) (3 CR)
This course covers advanced concepts of web page design using Adobe® Dreamweaver®. This course will teach students advanced design techniques to add efficiency, interactivity and visual interest to their Internet web site.

CIS 158 Programming Logic (3 CR)
Students explore the development of the logic and theory for writing business programs that control the operation of a computer. Course covers the development of both structured design and object-oriented design. Topics include control structures, arrays, data validation, testing and debugging. **Prerequisite: CIS 101**

CIS 160 Programming in Visual Basic.NET (3 CR)
This course introduces students to principles and concepts of programming in a Windows® environment using the Visual Basic.NET programming language. Students learn to develop business applications by designing and creating a user interface and writing the necessary procedures using both structured and object oriented design. Topics covered include objects, variables, menus, arrays, file input/output, OLE methods, and debugging. Recommended computer programming majors take CIS 158 prior to this course.

CIS 165 JAVA Programming (3 CR)
Students use procedural and object-oriented programming capabilities to design, develop, and test computer programs. Topics covered include control structures, methods, objected oriented programming, classes, applets, and user interfaces.

CIS 170 Programming in C++ (3 CR)
Students study digital computing systems and how they are used to solve problems. Students use procedural and object oriented programming capabilities to design, develop, and test computer programs. Topics covered include program development, functions, control structures, text file operations, classes, recursion, arrays and pointers.

CIS 174 PC Repair/A+ Hardware Component (3 CR)
Course covers basic computer theory, logic, technological evolution, fundamental PC components, I/O peripheral identification, implementation, functionality, and printer fundamentals/types/diagnostics/troubleshooting/ basic repair.

CIS 175 PC Repair/A+ Software Component (3 CR)
Students gain familiarization with basic DOS functionality and manipulation for diagnostics, troubleshooting and repair with WIN O/S. Installation, configuration, troubleshooting, diagnostics, upgrade familiarity with necessary MS product for A+ certification. **Prerequisite: CIS 174**

CIS 176 A+ Certification Exam Preparation (1 CR)
Focus on A+ core exam module component essentials/fundamentals, includes real time test environment and materials. **Prerequisite: CIS 175**

CIS 177 Network+/Networking Fundamentals (3 CR)
Basic network media components, configuration, functionality and manipulation for installation, diagnostics, troubleshooting, integration, upgrade and repair. Various O/S platform configurations. Introduction to the OSI model, TCP/IP protocols, and other protocols in peer-to-peer and server-centric LAN/WAN environments.

CIS 179 Network+ Certification Exam Preparation (1 CR)
Focus on Network+ core exam module component essentials/fundamentals to include real time test environment and materials. **Prerequisite: CIS 177**

CIS 205 Introduction to Probability & Statistics (3 CR)
Introduction to basic descriptive statistics, probability theorems, frequency distributions and functions, binomial and normal probability distributions and functions, probability density functions, hypothesis testing, statistical inference, chi-square analysis, linear regression and correlation. **Prerequisite: MTH 131***

CIS 210 Office Administration Systems (4 CR)
Develop and integrate administrative support skills in communication, information technologies, administrative procedures, and problem solving. Topics include: records management, information/ communication systems, including electronic, space management and ergonomics, quality and productivity improvement techniques, meeting/ travel planning, records preparation/presentation and employment skills. Keyboarding skills are essential. **Prerequisite: CIS 101**

CIS 230 Practicum in Printing (4 CR)
Students receive hands-on introduction on how screen and offset printing works. The class will be project-oriented.
Prerequisite: CIS 101 or CIS 130

CIS 232 Integrated Design II (Adobe® InDesign®) (3 CR)
Students will design creative publications via Adobe® InDesign® while integrating designs from Adobe® PhotoShop® and Illustrator®. Topics in this class include: page layouts, styles, layers, color separation, and interactive PDFs.
Prerequisites: CIS 128 and CIS 132 or CIS 136

CIS 234 Graphic Technology Applications (3 CR)
Students prepare for career opportunities by defining areas of employment and identifying prospective employers in the graphic design profession. Students also create a professional portfolio to be used for employment interview purposes. **Prerequisites: CIS 128 and CIS 134**

CIS 243 Web Animation (3 CR)
Design fully interactive sites using Macromedia® Flash®. Students will draw vector graphics, use key tools to produce animations, and create an activity that drives dynamic web sites. Students will also produce multimedia presentations.
Prerequisites: ART 201, CIS 101 and CIS 143

CIS 244 Web Programming (3 CR)
Students will learn to design and maintain interactive and dynamic web applications within a server-based scripting environment.
Prerequisites: CIS 101 and CIS 143

CIS 245 Internship & Seminar I (3 CR)
Cooperative work experience conducted through conferences. The position must be obtained by the student and approved by the department before registration is permitted. **Instructor's consent required.**

CIS 246 Web Integration with Databases (3 CR)
Students will experience different approaches for creating web pages that interact with databases. This course will define how web sites are being used to support electronic commerce applications.
Prerequisites: CIS 101, CIS 122, and CIS 244

CIS 260 Advanced Visual Basic.NET (3 CR)
Further study of Visual Basic.NET. Students learn the advanced features of Visual Basic including writing relational database programs, web services, data structures and user controls.
Prerequisite: CIS 160

CIS 270 Advanced C++ Programming (3 CR)
Hands-on programming course using the Visual C++ language. Object-oriented programming concepts, input handling, the Microsoft® Foundation Class, and using the Windows® programming interface with Visual C++ tools are some of the topics discussed.
Prerequisite: CIS 170

CIS 273 Systems Concepts and Design (3 CR)
Students will design a system, prepare the related documentation and required programs, using an existing business as a model. Course covers flow charting a system, defining problems, and preparing new forms. Students determine a desirable file structure.

CIS 281 Microsoft® Networking 1 (3 CR)
Introduces students to the Microsoft® Windows® XP Professional operating systems in a enterprise environment. Topics include installation methods, users and groups, file systems, IP addressing and security.

CIS 282 Microsoft® Networking 2 (3 CR)
This course provides students with the knowledge and skills to install and maintain Microsoft® Windows® Server™ 2003. They will learn how to manage and maintain user accounts, group, and resources in a Microsoft® Windows® Server™ 2003 environment. Students will learn how to recover the system in the event of a system failure.

CIS 283 Microsoft® Networking 3 (3 CR)
This course provides students with the knowledge and skills to implement, manage, and maintain, Microsoft® Windows® Server™ 2003 network infrastructure. They will learn how to manage and maintain DHCP, DNS, and RRAS servers using Microsoft® Windows® Server™ 2003. Students will learn how to manage network security and maintain the network infrastructure.
Prerequisite: CIS 282

CIS 284 Microsoft® Networking 4 (3 CR)
This course provides students with the knowledge and skills to plan and maintain Microsoft® Windows® Server™ 2003 network infrastructure. They will learn how to plan IP addressing, Internet connectivity, name resolution and remote access. Students will learn how to secure their server, plan and set up PKI, and how to use IPSec.
Prerequisite: CIS 283

CIS 285 Microsoft® Directory Services (3 CR)
This course provides students with the knowledge and skills to successfully plan, implement, and troubleshoot a Microsoft® Windows® Server™ 2003 Active Directory service infrastructure. Topics include forest and domain structure, DNS, site topology and replication, organizational unit structure and delegation of administration, group policy, and user, group and computer account strategies and will help prepare the student for the Microsoft® 70-294 certification exam.
Prerequisite: CIS 284

CIS 286 Designing a Secure Microsoft® Network (3 CR)
This course will provide you with the knowledge and skills to implement, manage, maintain, and troubleshoot security in a Windows® Server™ 2003 network infrastructure and a Windows® Server™ 2003 PKI, also helps prepare the student for a Microsoft® certification exam.
Prerequisite: CIS 284

CIS 287 Interconnecting Cisco Network Devices (3 CR)
This course provides students with the knowledge and skills necessary to select, connect, configure and troubleshoot Cisco switches and routers. Topics covered are extending switched networks with VLANS, determining IP Routes, managing IP traffic with access control lists, establishing point-to-point connections, and establishing frame relay connections. **Prerequisite: CIS 177 or CIS 281**

CIS 289 Networking Security/Security+ (3 CR)
An overview of network security, including general security concepts, communication security, infrastructure security, cryptography basics and operational/organizational security including hands-on labs with common computer networking security tools.

CIS 290 Systems Administration SQL Server (3 CR)
This course provides students with the knowledge and skills required to install, configure, administer, set up security, and troubleshoot Microsoft® SQL server. **Prerequisite: CIS 282**

COMPUTER SCIENCE (CPS)

CPS 177 Programming in C++ (3 CR)
Students study digital computing systems and how they are used to solve problems. Students use procedural and object-oriented programming capabilities to design, develop, and test computer programs. Topics covered include program development, functions, control structures, text file operations, classes, recursion, arrays and pointers.

CPS 217 Computer Science II (3 CR)
This course is a continuation of CPS 177. Students are introduced to major data structures used for data storage and processing. These include arrays, lists, stacks, queries and trees. Algorithms for searching, sorting and updating structures are developed and analyzed. **Prerequisite: CPS 177**

CRIMINAL JUSTICE (CRJ)

CRJ 101 Criminal Law (3 CR)
This course covers both substantive and procedural law at local, state and federal levels. Special emphasis given to the Michigan Penal Code and landmark court decisions. **Prerequisite: ENG 085***

CRJ 102 Criminal Investigation (3 CR)
This course covers the fundamentals of criminal investigation, theory and practice, from crime scene to courtroom, with emphasis on techniques appropriate to specific crimes.
Prerequisite: ENG 085*

CRJ 104 Criminal Justice Psychology (3 CR)
This course is an overview of criminal behavior from a psych-social perspective. Contemporary research, theory and practice concerning the psychology of crime are reviewed.
Prerequisite: ENG 085*

CRJ 108 Criminal Justice Fieldwork-Security (3 CR)
This course is an introduction to security internship at Jackson Community College. Course includes, but is not limited to, training in AED/CPR, chemical irritants, courtroom demeanor and testimony. Also includes a minimum of 14 hours per week of job training. Instructor permission is required for this course.

CRJ 109 Advanced Security Training (2 CR)
This course provides students with advanced security training as a safety security officer at Jackson Community College. Instructor permission is required for this course. **Prerequisite: CRJ 108**

CRJ 111 Introduction to Criminal Justice (3 CR)
This course covers the history, evolution and philosophy of the American criminal justice system. Emphasis on the interrelationship of system components: police, attorneys, courts and corrections.
Prerequisites: ENG 085* and ENG 090*

CRJ 112 Crime & Delinquency (3 CR)
Introduction to deviant behavior and current criminological theories with emphasis on synthesis and police applications to juveniles; diversion and status offenses considered. **Prerequisite: ENG 085***

CRJ 113 Introduction to Criminalistics (3 CR)
Scientific methods applied to the collection, identification, preservation and transportation of physical evidence and taught in a laboratory setting. **Prerequisite: ENG 085***

CRJ 114 Police Administration & Operations (3 CR)
Administration and operation of a police department including line/staff activities are explored.
Prerequisites: ENG 085* and ENG 090*

CRJ 116 Fire Investigation I (3 CR)
Reviews arson and fire laws and their application. Investigative methods unique to the fire scene will also be covered. Particular value to criminal justice students and fire fighting personnel.
Prerequisite: ENG 085*

CRJ 117 Criminology (3 CR)
(SAME AS SOC 117)
Provides an understanding of the cultural nature, origin, and development of criminal behavior with attention given to the psychological and sociological factors involved.
Prerequisites: ENG 085* and ENG 090*

CRJ 119 Client Growth & Development (3 CR)
A corrections-oriented course involving the study of normal versus criminal behavior, human development and criminal pattern. Also involves the study of specific problems including substance abuse, sexual and medical problems and disorders.
Prerequisites: ENG 085* and ENG 090*

CRJ 120 Human Relations for Corrections (3 CR)
A study of the meaning and function of culture and the social and psychological implications of discrimination. Also involves a survey of minorities in Michigan, attitude formation and professional responsiveness.
Prerequisites: ENG 085* and ENG 090*

CRJ 121 Introduction to Corrections (3 CR)
A survey of the American corrections system as a component of the criminal justice system.
Prerequisites: ENG 085* and ENG 090*

CRJ 124 Institution Populations (3 CR)
The nature, composition and dynamics of the prison population as a separate society are central topics in this course.
Prerequisites: ENG 085* and ENG 090*

CRJ 125 Parole & Probation (3 CR)
Pre- and post-institutional treatment and alternatives are presented. Consideration also given to diversion and community-based correctional programs.
Prerequisites: ENG 085* and ENG 090*

CRJ 127 Corrections Law (3 CR)
Deals with the law as it applies to the correctional system. Applicable court cases and legislation will be considered. Topics will include sentencing, prisoners' rights and responsibilities; loss of rights, prisoner remedies; community corrections and restoration of rights of offenders.
Prerequisites: ENG 085* and ENG 090*

CRJ 203 Field Studies (3 CR)
(SAME AS SOC 203)
This course provides an opportunity for students to work for one semester in a law enforcement or corrections agency. Only open to students who have reached sophomore level (26 or more credit hours), minimum 2.5 GPA and permission of the instructor.

DANCE (DAN)

DAN 121 Jazz Techniques (3 CR)
(SAME AS HPF 221)
Beginner to intermediate level class exploring contemporary jazz and modern dance techniques. Includes an introduction to the fundamentals of choreography, exploration of the elements of dance, and history of dance.

DAN 122 Jazz Techniques II (3 CR)
An advanced approach to jazz dance with emphasis upon combining jazz pieces into complete choreographies.
Prerequisite: DAN 121 or HPF 221

DIAGNOSTIC MEDICAL SONOGRAPHY (DMS)

DMS 100 Introduction to Diagnostic Imaging (3 CR)
Students are introduced to the radiologic sciences. Modalities discussed include X-rays, nuclear medicine, ultrasound, computerized axial tomography (CAT), magnetic resonance imaging (MRI) and photon emission tomography (PET). Students learn indications for a variety of diagnostic studies, how they are evaluated and interpreted, correlations of multiple studies, and how to prepare the patient for the study.

DMS 101 Sonographic Orientation (3 CR)
This course prepares sonography students for their clinical work-site experiences. Students will explore interpersonal relationship skills, ethical decision-making, and a review of clinical technical skills as they relate to the on-site work experience. Students will learn basic cross-sectional anatomy as related to beginning sonographic scanning of the abdomen.
Prerequisite: Acceptance into DMS program

DMS 104 Introduction to Sonographic Instrumentation (3 CR)
Students will learn the history and basic principles of static and real-time ultrasound machines. The instrumentation of A-mode and its conversion into the real time B-mode scanners will be explored. Laboratory assignments reinforce learning activities.
Prerequisites: BIO 132 or BIO 155 or BIO 253, ENG 085* and MTH 131* or higher

DMS 105 Sonographic Techniques (3 CR)
This course instructs the DMS student in scan planes, anatomical positioning, scan protocols, scan preparations, scan scheduling, appropriate history recording, correlations with other diagnostic procedures, and the techniques required for initiating and completing diagnostic sonographic procedures of the abdominal, obstetrical and gynecological patients.
Prerequisites: DMS 101 and DMS 104

DMS 107 Sonographic Orientation-Vascular (3 CR)
This course prepares sonography students for their clinical work-site experiences. Students will explore interpersonal relationship skills, ethical decision-making, and a review of clinical technical skills as they relate to the on-site work experience. Students will learn basic cross-sectional anatomy as related to beginning sonographic scanning of the arterial and venous systems, of the extremities, neck and abdomen.

DMS 110 Interpretation I (4 CR)
In-depth cross-sectional anatomy related to sonographic scanning of the abdomen, pelvis, and gravid uterus are presented. Specific attention to the coursing of vessels from points of origin to their location of termination is stressed and mastery level achievement is encouraged and expected.
Prerequisite: DMS 101

DMS 122 Clinical Experience I (6 CR)
Students receive supervised clinical work experience in an approved clinical education center. This course provides basic scanning opportunities, patient interviewing techniques, professional attitudes and ethics, and other basic patient/professional situations under the direct supervision of a registered diagnostic medical sonographer (RDMS). Completion of professional and technical scanning proficiencies are required. A minimum of 515 hours are required to complete this course. **Prerequisite: DMS 101**

DMS 140 Sonographic Orientation & Technique (3 CR)
This course facilitates student learning as they prepare for their clinical rotation by learning concepts that apply to the skills required to be competent as a student cardiac sonographer. Topics of study include in-depth anatomy and physiology of the heart and great vessels, nomenclature of left ventricular segments, LV assessment and function, clinical indications for the echo, all for preparation of applying correct techniques for acquisition for cardiac images. Developing interpersonal skills and exploring processes for promoting teamwork is stressed.

DMS 141 Adult Echo I (4 CR)
This course facilitates students learning of the normal and abnormal anatomy and physiology of the heart and great vessels. Topics will include M-mode, 2D and Doppler imaging, normal values of anatomic structures, pressures and hemodynamic functions. Students will be establishing standards that will meet the high demands for quality in performance of cardiac sonography. All learning material meets or exceeds the minimum standards outline set forth by the American Registry of Diagnostic Medical Sonographers.

DMS 143 Echo Clinical I (3 CR)
Students receive 240 hours of supervised clinical experience in an echo lab at an approved medical facility. This course provides hands-on experience in basic cardiac imaging, patient care, and application of knowledge and skills acquired in DMS 140 and DMS 141. Successful completion of scanning proficiencies required to remain in the program.

DMS 144 Cardiovascular Principles (3 CR)
This course is a study of cardiac physiology, intracardiac pressures and principles of flow, cardiac hemodynamics and principles of Doppler and EKG interpretation. Problem solving, evaluation and echo interpretation will be covered in this course.
Prerequisites: DMS 140 and DMS 141

DMS 147 Echo Clinical II (5 CR)
Students receive 384 hours of supervised clinical experience in an echo lab at an approved medical facility. This course provides hands-on experience in intermediate level cardiac imaging, use of cardiovascular equations, and application of knowledge and skill acquired in DMS 144. Successful completion of scanning proficiencies required to remain in the program.
Prerequisite: DMS 143

DMS 151 Peripheral Arterial I (3 CR)
This course facilitates student learning of diagnostic testing methods for the peripheral arterial systems of the upper and lower extremities. Testing methods covered will include segmental pressures, color doppler imaging (CDI) and duplex sonography.
Prerequisite: BIO 132 or BIO 155 or BIO 253

DMS 152 Peripheral Arterial II (3 CR)
This course, a continuation of DMS 151, facilitates student learning of diagnostic testing methods for the peripheral arterial systems of the upper and lower extremities. Testing methods covered will include segmental pressures, color Doppler imaging (CDI) and duplex sonography. Abdominal vascular testing techniques will be included.
Prerequisite: DMS 151

DMS 155 Peripheral Venous (3 CR)
This course facilitates student learning of diagnostic testing methods for the peripheral venous systems of the upper and lower extremities. Venous hemodynamics and testing methods covered include all areas of color Doppler imaging (CDI), air and photo plethysmography.
Prerequisite: BIO 132 or BIO 155 or BIO 253

DMS 161 Vascular Clinical I (4 CR)
Students receive 300+ hours of supervised clinical experience in an approved vascular laboratory. This course provides hands-on experiences in basic color Doppler imaging (CDI), hemodynamics, segmental pressures and duplex sonography. Students are instructed and supervised by registered vascular technologists. Completion of clinical competencies is required to complete this course.

DMS 206 Sonographic Instrumentation (4 CR)
Students explore the mechanics of A-mode, B-mode, M-mode, Doppler, and real time equipment. Accessory equipment such as cameras, transducers, phased, annular and linear arrays, and all types of hard copy documentation instruments are investigated. Multiple methods of preventative maintenance and quality control are presented. Laboratory reinforces learning activities.

DMS 211 Interpretation II (4 CR)
Students learn advanced cross-sectional anatomy and pathology as related to sonographic scanning of the abdomen, pelvis, and gravid uterus. The class gives specific attention to pathological change of specific, non-specific diseases, and trauma as they relate to sonographic imaging and sonographic interpretation of the abdomen, pelvis, gravid uterus, and small parts. Mastery level achievement is encouraged and expected.
Prerequisites: DMS 110 and DMS 122

DMS 212 Interpretation III (4 CR)
This course includes advanced scanning practices with introduction to cardiac, peripheral vascular, neurosonography, breast, prostate, and musculoskeletal scanning. Invasive procedures and intra-operative scanning protocols and techniques will be enhanced upon. Opportunity and aid is given for ARDMS board applications. Extensive review of all facets of sonography is included in preparation for the ARDMS board exams.
Prerequisites: DMS 211 and DMS 223

DMS 223 Clinical Experience II (6 CR)
This course includes supervised clinical experience in an approved clinical education center, advanced scanning techniques to demonstrate cross-sectional anatomy and pathology of specific and non-specific disease and traumatic changes. Specific attention is given to fetal development, fetal anomalies, abnormal pre-natal and maternal conditions as they relate to sonographic scanning and interpreting of images. Although the student is still under the supervision of a RDMS professional, the student is expected to perform sonographic procedures independently as a regular portion of this course. The completion of professional and technical scanning proficiencies are required. A minimum of 515 clinical hours are required for successful completion of this course.
Prerequisites: DMS 122 and DMS 110

DMS 224 Clinical Experience III (6 CR)
This course includes supervised clinical experience in an approved clinical education center. Advanced scanning procedures, methods and experience are provided in this course. Students experience advanced scanning modalities via M-mode, Doppler, 3 D, real-time and invasive procedures. Comparative interpretations of sonographic imaging with other diagnostic imaging modalities are provided. Students are expected to initiate, perform, and complete all sonographic procedures with direct supervision by a RDMS. The successful completion of professional and technical scanning proficiencies are required. A minimum of 320 clinical hours are required to successfully complete this course.
Prerequisites: DMS 211 and DMS 223

DMS 240 Adult Echo II (4 CR)
Students will focus their studies on the abnormal heart. Valvular disease, coronary artery disease, diseases of the myocardium, cardiac masses and tumors, pericardial disease and diseases of the aorta are some of the topics to be covered. Students will also learn the various appearances of congenital heart disease in the adult heart.
Prerequisites: DMS 140, DMS 141 and DMS 144

DMS 242 Adult Echo III (7 CR)
Students receive 512 hours of supervised clinical experience in an echo lab at an approved medical facility. This course provides hands-on experience at an advanced level of cardiac imaging and use of cardiovascular equations. Interpretation skills will apply. Successful completion of scanning proficiencies is required to graduate from the program. **Prerequisites: DMS 143 and DMS 147**

DMS 251 Cerebrovascular I (3 CR)
This course facilitates student learning of diagnostic testing methods and hemodynamics of the extracranial vessels of the head and neck. Testing methods covered include color Doppler imaging (CDI) and duplex sonography.
Prerequisite: BIO 132 or BIO 155 or BIO 253

DMS 253 Cerebrovascular II (1 CR)
This course is a continuation of DMS 251. Facilitates student learning of diagnostic testing methods and hemodynamics of the intracranial vessels. Testing methods covered include color Doppler imaging (CDI) and duplex sonography.
Prerequisite: DMS 251

DMS 265 Vascular Clinical II (4 CR)
This course is a continuation of DMS 161. Students receive 300+ hours of supervised clinical experience in an approved vascular laboratory. It also provides hands-on experiences in basic and advanced color Doppler imaging (CDI), hemodynamics, segmental pressures and duplex sonography. Students are instructed and supervised by registered vascular technologists. Completion of clinical competencies required to complete this course.

DMS 266 Vascular Clinical III (4 CR)
This course is a continuation of DMS 265. Students receive 300 hours of supervised clinical experience in an approved vascular laboratory. It also provides hands-on experiences in advanced color Doppler imaging (CDI), hemodynamics, segmental pressures and duplex sonography. Students are instructed and supervised by registered vascular technologists. Completion of clinical competencies is required to complete this course.

EARLY CHILDHOOD EDUCATION (ECE)

ECE 127 Performing Arts & Young Children (1 CR)
Based on the research findings of success of the Wolf Trap Institute for Early Learning through the Arts, the arts can provide powerful teaching strategies capable of helping children learn skills that serve as the foundation of all future learning. This course offers a blend of theory and application while enhancing the student's understanding of the performing arts. It explores ways to teach children basic academic and life skills through active participation in performing arts activities and trains students through the practical application of these techniques. One observation outside scheduled class time will be required.

ECE 128 Exploring Nature With Young Children (1 CR)
Young children have great curiosity about the world and how it works. This course will explore methodology, resources and developmentally appropriate curriculum for young children in order to place emphasis on: children developing a sense of respect and caring for the natural environment during their first few years of life, recognizing that positive interactions with the natural environment are an important part of healthy child development, and these interactions enhance learning and the quality of life.

ECE 129 Emergent Math (1 CR)
Young children are natural mathematicians. This course will explore methodology, resources and developmentally appropriate curriculum for young children in order to place emphasis on increasing children's confidence in their ability to: think and communicate mathematically, solve problems, make decisions in selecting mathematical strategies and techniques, recognize familiar structure in unfamiliar settings, and detect patterns and analyze data.

ECE 130 Emergent Literacy (3 CR)
Based on the assumption that literacy begins long before a child's exposure to formal instruction, this course offers a blend of theory and application while enhancing the student's understanding of emergent literacy. It explores the development and assessment of language and writing, the role of children's literature and shared language time, and the teacher's role in designing learning activities and providing a literacy-rich environment. Two observations outside of the scheduled class time will be required.
Prerequisites: ENG 085* and ENG 090*

ECE 131 Working with Infants/Toddlers (3 CR)
Working with children ages birth-3 years is not a scaled-down version of preschool. In this course, students study young infants (birth-8 months), mobile infants (9-17 months) and toddlers (18-36 months). In preparation for providing quality care, students explore ways: 1) to establish and maintain a safe and healthy learning environment; 2) to advance physical and intellectual competence; 3) to support social and emotional development and provide positive guidance; 4) to establish positive and productive relationships with families; 5) to ensure a well-run, purposeful program responsive to participant needs; and, 6) to maintain commitment to professionalism. Two observation/field experiences outside the scheduled class time (associated with CDA competency areas) will be required. This course can be used, with others, to meet educational requirements for application to the Council for Professional Recognition for an Infant/Toddler Child Development Associate Certificate. **Prerequisite: ENG 090***

ECE 132 Working with Exceptional Children (3 CR)
Young children with special needs are increasingly receiving services in integrated settings along with their typically developing peers. In preparation for providing successful inclusion experiences, students explore: 1) the uniqueness of early childhood as a developmental phase; 2) the significant role of families in early education and intervention; 3) the role of developmentally and individually appropriate practices; 4) the importance of culturally competent professional behavior; and 5) the importance of collaborative interpersonal and inter-professional actions. One observation/field experience outside of the scheduled class time for each competency area is required.
Prerequisites: ENG 085* and ENG 090*

ECE 133 Program Management (3 CR)
A high quality early childhood program is one that meets the needs of and promotes the physical, social, emotional and cognitive development of the children and adults – parents, staff and administrators – who are involved in the program. In preparation for administering a high-quality program, students explore: 1) administration, organization and operation strategies - principles of management; 2) physical and programmatic environments; 3) curriculum; 4) staffing - selection and development; 5) communication - child-staff-parent interactions; 6) collaboration, 7) program evaluation; and 8) accreditation. Students will need to be working in, or have access to a program, where they can conduct two interviews/observations outside of the scheduled class time.
Prerequisite: ENG 090*

ECE 140 Early Childhood Guidance (3 CR)
This course explores issues related to health and safety within an early childhood setting and examines strategies in communicating and guiding the behaviors of young children. Methods and materials to enhance self-concept will also be explored. Students will learn about: 1) providing a safe environment to prevent and reduce injuries; 2) promoting good health and nutrition, and providing an environment that contributes to the prevention of illness; 3) actively communicating with children and providing opportunities and support for children to understand, acquire, and use verbal and non-verbal means of communicating thoughts and feelings; 4) providing physical and emotional security for each child and helping each child to know, accept and take pride in self, and to develop a sense of independence; and 5) providing a supportive environment in which children can begin to learn and practice appropriate and acceptable behaviors as an individual and as a group. These are five of the CDA competency standards. One observation outside the scheduled class time for each competency area is required.
Prerequisite: ENG 090*

ECE 142 Professionalism in Child Development (3 CR)
This course focuses on professionalism, families and program management. Students will: 1) explore strategies in communicating and establishing productive relationships with families, including maintaining an open, friendly and cooperative relationship with each child's family that encourages their involvement in the program and supports the child's relationship with their family; 2) explore strategies for utilizing all available resources in order to manage an effective program operation by being a competent organizer, planner, record keeper, communicator and cooperative co-worker, and 3) address issues of professional commitment, ethical practices and advocacy in order to promote quality in early care and education service. These are three of the CDA competency standards. Students will also learn observation techniques and ways to individualize programming for young children. One observation outside the scheduled class time for each competency is required. **Prerequisite: ENG 090***

ECE 143 CDA Assessment Preparation (1 CR)
This course is designed to assist the student in preparing for direct assessment for the Child Development Associate Credential or CDA. The course includes guidance in preparation of documentation and review of standards related to 13 functional areas. All requirements will follow the recommendations of the Council for Professional Recognition. Only students preparing an application for the CDA credential should enroll.
Prerequisite: Instructor Permission Required

ECE 144 Early Childhood Education (3 CR)
This course focuses on skills needed by providers in an early childhood setting. With a basis in early childhood development, the course content examines the meaning, importance, materials and methods in providing an appropriate learning environment for young children and enhancing social, physical, cognitive and creative development. Students will explore: 1) learning environments in terms of space, relationships, materials and routines as resources for constructing an interesting, secure, and enjoyable learning environment that encourages play, exploration and learning; 2) how to promote the physical development of children through the use of a variety of equipment, activities and opportunities; 3) enhancing the intellectual competence of children by providing activities and opportunities that encourage curiosity, exploration and problem-solving appropriate to the developmental levels and learning styles of children; 4) ways to provide opportunities that stimulate children to play with sound, rhythm, language, materials, space and ideas in individual ways and to express their creative abilities, and 5) social development in children through group acceptance, communication and getting along with others, empathy and mutual respect among children and adults. These are five of the CDA competency standards. One observation outside the scheduled class time for each competency area is required.
Prerequisite: ENG 090*

ECE 150 Directed Teaching I (2 CR)
This course is designed to provide opportunities for students to integrate theory and practice in a childcare setting. Directed Teaching I allows for guided experiences with children, families and collaborative service partners under the supervision of a mentoring teacher. Through direct work in a childcare setting, journals, group discussions and individual instructor observations and meetings, students will build upon their understanding of the best possible current practices in early childhood education. Directed Teaching I focuses on the physical and programmatic environment. One hundred (100) clock hours of direct classroom experience are required.
Prerequisite: ECE 140 and ECE 144

ECE 151 Directed Teaching II (2 CR)
This course is designed to provide opportunities for students to integrate theory and practice in a childcare setting. Directed Teaching II allows for guided experiences with children, families and collaborative service partners under the supervision of a mentoring teacher. Through direct work in a childcare setting, journals, group discussions and individual instructor observations and meetings, students will build upon their understanding of the best possible current practices in early childhood education. Focus for Directed Teaching II includes factors that influence learning and lesson planning experience. One hundred (100) clock hours of direct classroom experience are required.
Prerequisite: ECE 150

ECE 152 Directed Teaching III (2 CR)
This course is designed to provide opportunities for students to integrate theory and practice in a childcare setting. Directed Teaching III allows for guided experiences with children, families and collaborative service partners under the supervision of a mentoring teacher. Through direct work in a childcare setting, journals, group discussions and individual instructor observations and meetings, students will build upon their understanding of the best possible current practices in early childhood education. Focus for Directed Teaching III includes observation and assessment, individualized planning and communication with parents. One hundred (100) clock hours of direct classroom experience are required.
Prerequisite: ECE 142 and ECE 151

ECONOMICS (ECN)

ECN 231 Macroeconomics (3 CR)
This course covers macroeconomics and explains the operation of free markets, the role of government in the economy, measurement of the national product, inflation and unemployment, monetary and fiscal policy, and economic growth.
Prerequisites: ENG 085* and MTH 098* or higher

ECN 232 Microeconomics (3 CR)
This course covers microeconomics: the market structure of firms operating in competition and monopoly, labor markets and unions, how income is distributed, current economic problems, international economics, and alternative economic systems.
Prerequisites: ENG 085* and MTH 098* or higher

EDUCATION (EDU)

EDU 100 Pre-teaching Pathway (3 CR)
A career track introduction to the teaching profession designed for students with basic skill levels in reading, writing and math/science. Experiences in the course will include an introduction to: professional portfolio, teaching professionalism and technology. Students will begin the professional career path with grades pre-K to 12 field experiences and professional pathway planning, as well as investigating opportunities in the field of teacher education.

EDU 221 Exploring Teaching (3 CR)
"What are the things prospective teachers beginning their formal study of teacher education should know?" Students will gain knowledge of the role of a professional teacher and education topics: schools, diverse students and their needs, historical and current education issues and trends, as well as philosophical and legal foundations in American education. Students will explore and experience key concepts and skills through reading, research, presentation of a lesson, development of a professional portfolio and a teaching philosophy, documented technology and education site-based field experiences. Minimum of 16 hours field experience is included.
Prerequisites: ENG 085* and ENG 131

EDU 290 Instructional Skills Workshop (2 CR)
Instructional Skills Workshop course brings together best practices in education and a proven process that fosters personal growth and reflections about the teaching/learning process. The course includes: best practices in teaching/learning, lesson development and delivery, lesson assessment skills, and feedback skills. In addition, best practices in teaching techniques are explored and include: cooperative learning, multiple intelligences, assessment techniques, curriculum alignment, etc. This course is intended for anyone interested or employed in the teaching profession.

You may meet this prerequisite based on your course placement, ACT score or successful college coursework. Visit our web site for current assessment options and requirements.

ENGINEERING (EGR)

EGR 153 Engineering Drawing (4 CR)
Students examine the communication aspects of graphics emphasizing sketching and computer aided drafting and design. This course covers simple pictorial and working drawings, orthographic and isometric projections, an introduction to the mechanical design process, the basics of free hand sketching and of C.A.D. and the computer as a design tool.

EGR 261 Engineering Mechanics I (4 CR)
Students survey the fundamentals of solid mechanics. This course covers equilibrium, static equivalence, stress, strain, and material behavior, particular application to deflection of beams and axial, bending, torsion, shear and combined stresses, as well as an introduction to stability of columns. **Prerequisite: MTH 154**

EGR 262 Engineering Mechanics II (4 CR)
Students examine the principles of dynamics, including the motion of a particle, the kinematics and kinetics of plane motion of ridged bodies, the principle of work and energy, impulse and momentum and mechanical vibrations.
Prerequisite: EGR 261

ELECTRONIC TECHNOLOGY (ELT)

ELT 070 Basic Industrial Electricity (2 CR)
Fundamentals of electricity covering such topics as: voltage, current and resistance; Ohm's Law; series circuits; parallel circuits; AC, DC, power; capacitors; inductance; transformers; various solid state devices; motors of various types. Class is designed for general maintenance mechanics, heating/refrigeration/air conditioning mechanics, and other non-electrician uses.

ELT 074 National Electric Code (2 CR)
This course is the study of the national and local electric code for wiring and apparatuses. Covers wiring design and protection, wiring methods and materials, equipment for general use including motors and controllers, special occupancies such as hazardous location; special equipment such as electric welding and machine tool wiring, and the use of tables and diagrams for the solution of practical wiring problems. **Prerequisite: ELT 151**

ELT 120 Circuit Analysis I (4 CR)
Students examine the fundamental concepts of DC circuits including electricity and magnetism, resistance, capacitance, inductance, series and parallel circuits, power and basic electrical measurements.

ELT 124 AC Fundamentals (2 CR)
A study of alternating electrical current is presented. Topics include AC measurements, inductive reactance and capacitive reactance in AC circuits. Transformers are also explored.
Prerequisite: ELT 119

ELT 125 Circuit Analysis II (3 CR)
A study of alternating electrical current is presented.Topics include AC measurements, resistance, inductance and capacitance in AC circuits. Transformers and filters are explored.
Prerequisite: ELT 120

ELT 129 Semiconductor Devices (2 CR)
This course is the study of electronic devices including diodes, transistors, integrated circuits, and other semiconductor devices; their characteristics and application to practical circuitry.
Prerequisite: ELT 124

ELT 130 Electronics I (4 CR)
Study of electronic devices including diodes, bipolar and field effect transistors, integrated circuits, and other semiconductor devices; their parameters, nomenclature, characteristics, and application to practical circuitry.
Prerequisite: ELT 125

ELT 139 Digital Electronic Fundamentals (3 CR)
This course is the beginning course in digital electronics. Topics include number systems, basic logic gates, counters, shift registers. Decoders and encoders will also be explored.
Prerequisite: ELT 129

ELT 140 Introduction to Digital Electronics (4 CR)
This course is the beginning course in digital electronics. Topics include number systems, Boolean algebra, and basic logic gates and circuits.
Prerequisite: ELT 130

ELT 148 Electrical Math I (2 CR)
Introductory course beginning with algebra involving addition, subtraction, multiplication, division, equations, powers of 10, Ohm's Law, factoring, and other functions of math related to electrical problem solving.

ELT 149 Electrical Math II (2 CR)
This is an advanced course covering angles, trigonometric problems, right triangles, equations, vectors, periodic functions and related math applications as a tool of the trade.
Prerequisite: ELT 148

ELT 150 Residential Wiring (2 CR)
Topics covered in this course include blueprint reading, NEC code, branch circuit design, service entrance and switch control. Students will be able to practice wiring and design skills with hands-on experiences.

ELT 151 Commercial Wiring (2 CR)
Topics covered in this course include, wiring plans of commercial buildings, three phase 208/120 volt services, lighting fixtures, service entrances and metering facilities. The students will be given opportunities to practice skills in the wiring laboratory. **Prerequisite: ELT 150**

ELT 152 Industrial Wiring (2 CR)
Topics covered in this course include, substation and high voltage metering, feed duct, panel boards, motors and controllers, signal systems, ventilation and others. Students will be given opportunities to practice skills in the electrical wiring laboratory. **Prerequisite: ELT 150**

ELT 215 Electrical Troubleshooting (2 CR)
This course explores troubleshooting in various areas such as: control circuits, combination starters, control devices, special controls, DC motors, AC motors, lighting systems with use of schematics, building drawings, and with emphasis on cutting trouble-shooting time.
Prerequisite: ELT 148

ELT 220 Industrial Motion Control (3 CR)
This course covers motion controls as used in real world situations, including PLC, robotics, servos, sensing devices, actuators and controls.
Prerequisite: ELT 140

ELT 250 Electric Motors & Controls (4 CR)
Basic principles involved in the operation of motors and controls. Study includes single-phase motors and their operating principles, polyphase systems and the various control devices used with these systems. **Prerequisite: ELT 125**

ELT 260 Basic Programmable Controllers (4 CR)
Basic programmable controllers is a course for apprentices and skilled trades trainees looking at the history, characteristics, application and limitation of PCs. Numeration systems, binary-coded decimals, ASCII, gray code and Boolean logic studied. Additional study includes input/output devices, processing and programming functions, program development, documentation, start-up and troubleshooting. **Prerequisite: ELT 151**

ELT 265 SLC 500 Programming & Troubleshooting (2 CR)
Students will gain skills in programming and troubleshooting real world inputs and outputs. Hands-on instruction is used exclusively.
Prerequisite: ELT 260 or RTI 157

ELT 266 RSLOGIX Programming & Troubleshooting (2 CR)
This course covers RSLOGIX programming and troubleshooting. Topics include adding rungs, addressing I/O, online and offline editing and troubleshooting tools. **Prerequisite: ELT 260**

ELT 270 Communications Circuits (4 CR)
Circuits and theory related to electronic communication. Topics covered include RF amplifiers and oscillators, modulation and detection, fiber optics, antennas, digital techniques, transmitters and receivers.
Prerequisite: ELT 125 and ELT 130

ELT 280 Digital Systems (4 CR)
This course covers hardware organization of digital systems with emphasis on microprocessors and minicomputers. Treatment extends from general programming and interfacing techniques common to all microprocessors to the operation, programming, and applications of representative microprocessor families. **Prerequisite: ELT 140**

EMERGENCY MEDICAL SERVICES (EMS)

EMS 110 CPR & First Aid (2 CR)
This course provides instruction in adult, child and infant cardiopulmonary resuscitation, as well as advanced first aid. It is designed to prepare an individual to handle medical or accidental emergencies until professional help arrives or until the victim can seek help, and to handle minor injuries that do not require professional assistance. Upon successful completion of this course the student is qualified to receive CPR and Advanced First Aid certificates through the American Heart Association (AHA) and American Academy of Orthopedic Surgeons (AAOS).

EMS 125 EMT: Ambulance (6 CR)
Part I of a two semester EMT-A course. Completion of a clinical practicum is required and must be arranged on student's time. Completion of EMS 125 and EMS 126 enables student to take Michigan EMT Licensing exam. Lab included.
Prerequisite: ENG 085*

EMS 126 EMT: Ambulance (6 CR)
Part II of a two semester EMT-A course. Completion of a clinical practicum is required and must be arranged on student's time. Completion of EMS 125 and EMS 126 will enable student to take Michigan EMT Licensing exam. Lab included.
Prerequisite: EMS 125

EMS 211 Paramedic I (8 CR)
Paramedic course leading to certification as advanced emergency medical technician. First semester covers medical, legal, patient assessment, acid base balance, IV therapy and respiratory.
Prerequisite: Instructor Permission Required

EMS 212 Paramedic Lab I (2 CR)
Laboratory for EMS 211.

EMS 213 Paramedic Clinical I (2 CR)
Clinical for EMS 211.

EMS 221 Paramedic II (8 CR/W)
Continuation of paramedic training, covering cardiology and pharmacology.
Prerequisite: EMS 211

EMS 222 Paramedic Lab II (2 CR)
Laboratory for EMS 221.

EMS 223 Paramedic Clinical II (2 CR)
Clinical for EMS 221.

EMS 231 Paramedic III (8 CR/S)
Continuation of paramedic training, covering medical emergencies, environmental emergencies and psychological emergencies.
Prerequisite: EMS 221

EMS 232 Paramedic Lab III (2 CR)
Laboratory for EMS 231.

EMS 233 Paramedic Clinical III (2 CR)
Clinical for EMS 231.

EMS 242 Paramedic Lab IV (2 CR)
This is the fourth and final lab in the paramedic program. During this lab time the student will review all practical skills in order to better prepare for the National Registry exam. In addition, the student will practice written test taking skills with sample tests and a national review manual. Class will meet every other week for the full semester of 16 weeks allowing eight lab sessions.
Prerequisite: EMS 231

EMS 243 Paramedic Clinical IV (6 CR)
This is the final clinical rotation for senior paramedic students. Students will schedule one EMS ambulance shift per week along with one hospital shift per week. This clinical rotation will last for the full semester of 16 weeks.
Prerequisite: EMS 231

ENGLISH (ENG)

ENG 080 Reading Essentials (4 CR)
This course provides the most fundamental support for students who need to develop college-level reading skills. Students must show an ability to read some pre-college writing independently. They are provided with a sequentially structured approach to comprehending college-level writing. Student writing is a significant component.

ENG 085 College Reading (4 CR)
This course is intended for students who have developed their reading skills nearly to the college level. Further skill and knowledge development focuses on the common patterns of text found in both narrative and expository writing, on strategies for self-monitoring and memory enhancement, and on the development of vocabulary typically found in college level textbooks. Student writing is a significant component. **Prerequisite: ENG 080***

ENG 090 Introduction to Writing (4 CR)
This is an intensive course in composition for students who need supplementary help in writing. A personal approach helps students enhance their writing abilities, resolve writing problems and explore writing strategies. An end of semester portfolio and an additional 16 hours of writing activities and workshops are required.

ENG 106 Publication Newspaper (3 CR)
Students work with editors and advisors of college newspaper in reporting, copywriting, photography, layout, make-up, advertising sales and financing. May be taken two times for credit.
Prerequisites: ENG 085* and ENG 090*

ENG 131 Writing Experience (3 CR)
This is an intensive writing course designed to help students improve, strengthen and refine writing skills. Research methods are introduced. An end of the semester portfolio of narrative and informative writings and an additional 16 hours of writing activities and workshops are required.
Prerequisites: ENG 080* and ENG 090*

ENG 132 Writing Experience (3 CR)
This course is a continuation of the writing instruction and practice begun in ENG 131 with an emphasis on critical thinking, information gathering, and those forms of writing useful to academic and professional life. Research writing is emphasized. An end of the semester portfolio of informative and research writings and an additional 16 hours of writing activities and workshops are required. **Prerequisite: ENG 131**

ENG 186 Intro Photojournalism (3 CR)
Use of the 35 mm single reflex camera and introduction to digital camera use. Camera operation and darkroom procedures (film development and enlargements) are covered. Instruction emphasizes photographic equipment, lenses, exposure and composition.

ENG 201 Advanced Composition (3 CR)
An advanced course offering. Selected students practice peer tutoring and research writing. Emphasis is placed on student writing conferences, process writing, and standard research methods. End of the semester portfolio of research papers and 16 hours of writing activities and workshops are required. Additionally, all students enrolled in this course work as tutors in the Writing Center.
Prerequisite: Instructor Permission Required

ENG 206 Publication Newspaper (2 CR)
Students work with editors and advisors of college newspaper in reporting, copywriting, photography, layout, make-up, advertising sales and financing. May be repeated once for credit.
Prerequisite: ENG 106

ENG 210 Introduction to Film (3 CR)
Students are introduced to film as a visual art and to basic film terms and techniques, such as composition, movement, editing and sound. Readings in film history, genre, theory and criticism. Includes JCC Winter Film Series.
Prerequisites: ENG 085* and ENG 131

ENG 232 Technical & Business Writing (3 CR)
A course designed to provide practice in a variety of written and oral communications to meet the requirements of the workplace. Projects may include descriptions, instructions, resumes, proposals, reports or online documents. It involves frequent writing, both in and out of class, as well as oral presentations, collaborative activities and individual conferences.
Prerequisites: ENG 085* and ENG 131

ENG 236 Women In a Changing Society (3 CR)
(SAME AS SOC 236)
Inquiry into historical and changing roles of women, looking at causes of these changes and their effects on women and society through literature, sociology, biology and history.
Prerequisites: ENG 085* and ENG 131

ENG 246 Short Story & Novel (3 CR)
Students are introduced to traditional and contemporary fictional genres. This course emphasizes understanding, appreciation and the critical analysis of narrative art. Selections for study are chosen from English and American literature as well as world literature in translation.
Prerequisites: ENG 085* and ENG 131

ENG 247 Poetry & Drama (3 CR)
Students are introduced to lyric and dramatic genres. This course emphasizes understanding, appreciation and enjoyment of poetry and theatre as language performances and literary forms. Selections for study are chosen from English and American literature as well as world literature in translation.
Prerequisites: ENG 085* and ENG 131

ENG 249 African-American Literature (3 CR)
Survey of the literature of African-American writers. Emphasis is on the major writers in narrative, poetry, fiction, essay and drama.
Prerequisites: ENG 085* and ENG 131

ENG 252 Shakespeare (3 CR)
Students read representative plays and are introduced to the Elizabethan world. Course emphasizes developing understanding, appreciation and critical analysis skills.
Prerequisites: ENG 085* and ENG 131

ENG 254 Children's Literature (3 CR)
Students survey the various genres of children's literature from a critical point of view. Course emphasizes developing student competency in oral reading and presentation of children's literature.
Prerequisites: ENG 085* and ENG 131

ENG 255 American Literature-19th Century (3 CR)
Students examine the development of a distinctive American literature and culture during the 19th century. Students read selections from many writers, with emphasis on major figures such as Hawthorne, Melville, Thoreau, Emerson, Poe, Dickinson, Whitman, Douglass and Jacobs.
Prerequisites: ENG 085* and ENG 131

ENG 256 American Literature-20th Century (3 CR)
Students examine the literature and culture of America from 1890 to the present, with emphasis on the development of organic and post-modern writing in narrative, poetic and critical modes.
Prerequisites: ENG 085* and ENG 131

ENG 257 World Literature I (3 CR)
Students compare major themes and writers from Africa, America, Asia and Europe.
Prerequisites: ENG 085* and ENG 131

ENG 261 Creative Writing I (3 CR)
Students experiment with writing poetry, fiction, drama and creative nonfiction for discussion and criticism. Students invent, collaborate and revise before submitting a portfolio of their work. Contemporary readings and visiting authors/videos enhance the class, but primary attention is given to students' creative writing process.
Prerequisites: ENG 085* and ENG 131

ENG 262 Creative Writing II (3 CR)
Students in this workshop write fiction, poetry and other forms, and present writing for criticism and discussion. Contemporary readings emphasize participation of writers in a living act. Students write and workshop fiction, poetry and other genres. Contemporary readings emphasize writing invention and writing communities.
Prerequisites: ENG 261

ENGLISH AS A SECOND LANGUAGE (ESL)

ESL 080 English as a Second Language: Beginning I (1 CR)
This course is designed for the student with little or no background in English. Students learn integrated basic skills in reading, writing, speaking and listening. *NOTE: This course will not apply towards a JCC degree or certificate*.

ESL 081 English as a Second Language: Beginning II (1 CR)
This course is a continuation of ESL 080, designed for the student with little or no background in English. Students learn integrated basic skills. *NOTE: This course will not apply towards a JCC degree or certificate*. **Prerequisite: ESL 080**

ESL 085 English as a Second Language: Basic I (1 CR)
Students learn to use English to get along in the community. In addition to the integrated basic skills in reading, writing, speaking and listening, students learn strategies to help them communicate with more success. *NOTE: This course will not apply towards a JCC degree or certificate*.
Prerequisite: ESL 081

ESL 086 English as a Second Language: Basic II (1 CR)
This course continues the coursework begun in ESL 085. Students learn integrated basic skills and strategies to help them communicate with more success. *NOTE: This course will not apply towards a JCC degree or certificate*.
Prerequisite: ESL 085

ESL 090 English as a Second Language: Intermediate I (1 CR)
Students increase their vocabulary and understanding of grammatical structures, enhance their communication strategies and practice the four language skills. At this level a student may focus more strongly on particular language skills to increase proficiency in that skill. *NOTE: this course will not apply towards a JCC degree or certificate*. **Prerequisite: ESL 086**

ESL 091 English as a Second Language: Intermediate II (1 CR)
This continues the coursework begun in ESL 090. Students study vocabulary, grammatical structures, communication strategies and practice the four language skills with a stronger focus on one language skill. *NOTE: This course will not apply towards a JCC degree or certificate*.
Prerequisite: ESL 090

ESL 095 English as a Second Language: Advanced I (1 CR)
Students practice advanced comprehension strategies and continue to refine their communication skills. Advanced students should also be able to succeed in an academic course with native speakers. *NOTE: This course will not apply towards a JCC degree or certificate*.
Prerequisite: ESL 090 or ESL 091

ESL 096 English as a Second Language: Advanced II (1 CR)
This continues the coursework begun in ESL 095. Students refine communication strategies and may focus on one language skill to improve proficiency. *NOTE: This course will not apply towards a JCC degree or certificate*. **Prerequisite: ESL 095**

ENTREPRENEURSHIP (ENT)

ENT 160 Introduction to Entrepreneurship (2 CR)
Students will understand the role of entrepreneurial businesses in the United States and the impact on our local, regional, national and global economy. The student will evaluate the skills and commitment necessary to successfully operate an entrepreneurial venture. Additionally the student will review the challenges and rewards of entrepreneurship as a career choice as well as entrance strategies to accomplish such a choice.

ENT 161 Opportunity Analysis (2 CR)
The student will assess his/her personal readiness for an entrepreneurial venture(s) by evaluating their skills, experience and academic preparation. The student will assess the current economic, social and political climate for their entrepreneurial idea(s). Additionally, the student will be able to analyze and determine whether or not their business concept fits or doesn't fit into the current business environment.

ENT 162 Legal Issues for Small Business (2 CR)
The student will be able to identify the forms of business ownership and the legal and tax implications for each. In addition, the student will be able to explain laws covering issues such as personnel, contracts and protection of intellectual property. The student will also be able to explain the reporting requirements for local, state and federal agencies.

ENT 163 Financial Management for Small Business (2 CR)
The student will be able to identify and evaluate the various sources available for funding a small business; demonstrate an understanding of financial terminology; read, prepare and analyze a financial statement; and write a loan proposal. In addition, the student will be able to identify financing needs, establish credit policies, and prepare sales forecasts.

ENT 164 Entrepreneurial Marketing (2 CR)
In this course, the student will gain insights essential for marketing their entrepreneurial venture utilizing innovative and financially responsible marketing strategies. The student will analyze marketing philosophies implemented by key successful entrepreneurs. Additionally, the student will prepare a marketing plan to launch their entrepreneurial venture and a marketing plan to implement during the first two years of business operation.

ENT 169 Business Plan (3 CR)
The student will be able to evaluate their business concept and write a sound business plan for their entrepreneurial venture. In the process of doing so, the student will be able to assess the strengths and weaknesses of a business concept; collect and organize market research data into a marketing plan; and prepare the financial projects for their business venture. In addition, students will be able to identify and evaluate various resources available for funding the entrepreneurial venture. To be successful in this course basic computer skills are required. **Prerequisite: ENT 161**

FRESHMAN YEAR SEMINAR (FYS)

FYS 105 College Success Seminar (1 CR)
This first year experience course focuses on the transition of high school graduates into their first semester of college with an emphasis on developing study strategies, teamwork and problem solving. Basic academic areas will be reviewed to improve skill levels prior to fall semester.

FYS 110 Life Maps (1 CR)
This first year experience course equips students for transitions in education and life. Students will be actively involved in learning and integrating practical applications to promote success. Students will develop a learning portfolio and an educational plan while enhancing critical thinking and study strategies.

FRENCH (FRN)

FRN 131 Elementary French I (4 CR)
Introduces and develops the four skills of language learning: listening, speaking, reading and writing, with special emphasis on listening and speaking.
Prerequisite: ENG 085*

FRN 132 Elementary French II (4 CR)
Provides increased practice in the basic language skills; listening, speaking, reading and writing.
Prerequisite: FRN 131

GEOLOGY (GEL)

GEL 160 Introduction to Geology (4 CR)
The course covers minerals, rocks, earthquakes and volcanoes. It also covers the landscapes and behaviors of continents and oceans. Diagrams, photographs, topographic maps, Internet resources and hands-on exercises are utilized to support the concepts. Course includes a laboratory component.
Prerequisites: ENG 085* and ENG 090*

GEOGRAPHY (GEO)

GEO 131 Physical Geography (3 CR)
The course begins with maps and grid systems. Map exercises are used all semester to enhance the textbook. Other topics include meteorology, vegetation, earth materials and a range of tectonic and landscape subjects.

GEO 132 World Regions (3 CR)
This course covers all regions of the world from a human perspective. Topics include resources, population, settlements, agriculture, manufacturing and transportation. There is special emphasis on Internet research in the classroom.

GERMAN (GER)

GER 131 Elementary German (4 CR)
Introduces and develops the four skills of language learning: listening, speaking, reading and writing, with special emphasis on listening and speaking.
Prerequisite: ENG 085*

GER 132 Elementary German (4 CR)
Continuation of German 131 with increased practice in listening, reading, writing and speaking.
Prerequisite: GER 131

HISTORY (HIS)

HIS 120 Ancient History (3 CR)
Attempts to answer the question, "Where did it all begin?" with a survey of the politics, art and religion of the ancient world from history's beginning in Sumeria to the end of the ancient world when the Western Roman Empire faded out of sight in 476 A.D.
Prerequisites: ENG 085* and ENG 090*

HIS 125 African-American History (3 CR)
Examines the role African-Americans have historically played in the political, economic and social construction of America.
Prerequisites: ENG 085* and ENG 090*

HIS 131 Western Civilization to 1555 (4 CR)
Together with HIS 132, constitutes the basic history course, as well as an introduction to the humanities; the roots of Western culture and its development through the Reformation. Emphasis is placed upon the social, philosophical, scientific, artistic and religious evolution, as well as the political setting.
Prerequisites: ENG 085* and ENG 090*

HIS 132 Western Civilization 1555 to Present (4 CR)
Continuation of HIS 131, emphasizing the development of new political areas, economic and social theories, the evolution and expansion of modern states, and efforts to control international tensions.
Prerequisites: ENG 085* and ENG 090*

HIS 231 Development of the U.S. Through the Civil War (3 CR)
The study of American national history beginning with the colonization to the Civil War. Themes include exploration and settlement, development of political theory, development of the West and its influence on the country, the growth of sectionalism and the Civil War.
Prerequisites: ENG 085* and ENG 090*

HIS 232 Development of the U.S. from the Civil War (3 CR)
Continuation of HIS 231, from the period of the Civil War and Reconstruction. Emphasis on industrial, commercial and agricultural expansion; intellectual currents; outstanding social changes; the nation's expanding role in the world affairs, and the Cold War.
Prerequisites: ENG 085* and ENG 090*

HIS 235 20th Century History (3 CR)
Examination of national and international developments in the past century focusing on such matters as colonialism, global warfare, and emerging nations, appearance and disappearance of communism. In addition, polarization of wealth and power, the revolution in technology, communication, businesses and industry, the conflict between the globalization movement and national tendencies will be examined.
Prerequisite: ENG 085* and ENG 090*

HEALTH OCCUPATIONS (HOC)

HOC 130 Introduction to Health Occupations (3 CR)
Students through classroom and laboratory facilitation will examine health care teams, interactions between and reactions of patients in normal and altered states, professionalism, OSHA standards, medical ethics, lifting, moving, emergency assessment and response.

HEALTH & PHYSICAL FITNESS (HPF)

HPF 110 Golf (1 CR)
Learn beginning skills, rules and courtesies. This course emphasizes the swing, chipping and putting. Some equipment may be provided.

HPF 139 Spinning (1 CR)
A fast paced, invigorating workout to music utilizing specialized "spinning" stationary exercise bikes. Students are able to exercise at their own pace. The class is designed for a wide range of fitness levels.

HPF 156 Lifetime Fitness (2 CR)
For beginning exercisers and those reconditioning from injury, disability or illness. Emphasis is placed on balance, coordination, flexibility, muscular strength and endurance.

HPF 160 Wellness (1 CR)
Learn the theoretical and practical relationship of lifestyle to productivity. Students examine attitudes and behaviors that enhance quality of life and maximize personal potential. Students have opportunities for self-evaluation.
Prerequisite: ENG 085*

HPF 161 Personalized Fitness (1 CR)
Receive a personalized fitness program, which requires 25 hours of exericse during convenient times. This self-paced course emphasizes both cardiovascular and muscular fitness.

HPF 168 Weight Training & Conditioning (2 CR)
Includes both didactic and practical application of the principles of comprehensive exercise. Learn about the multi-dimensional components of exercise including cardiovascular, flexibility and body composition. Special focus is placed on muscular strength and endurance within the context of a wellness perspective. Under the supervision of the instructor, students work out in a state of the art fitness facility that includes Eagle/Cybex equipment and multiple cardiovascular machines as well as a 10-lap/mile track.
Prerequisite: ENG 085*

HPF 169 Aerobic Rhythms (1 CR)
Students at various fitness levels participate in a choreographed exercise/dance and step class for the improvement of cardiovascular fitness, strength and flexibility.

HPF 182 Light Walking (1 CR)
Use walking to develop cardiovascular fitness and lose weight. This course emphasizes both muscular endurance and flexibility.

HPF 184 Race Walking (1 CR)
Learn how to apply proper race walking techniques as well as training techniques that enhance race walking performance. This course emphasizes physical activity.

HPF 185 Circuit Training (1 CR)
Participate in a challenging aerobic workout. The class emphasizes cardiovascular fitness utilizing a variety of work stations.

HPF 187 Interval Training (1 CR)
Participate in a vigorous running workout. Intervals ranging in distance from 200-800 meters form the basis of the workout.

HPF 221 Jazz Techniques (3 CR)
(SAME AS DAN 121)
Beginner to intermediate level class exploring contemporary jazz and modern dance techniques. Includes an introduction to the fundamentals of choreography, exploration of the elements of dance, and history of dance.

HPF 268 Advanced Weight Training (2 CR)
Participate in fitness evaluations and individually prescribed programs designed to develop strength, aerobic endurance and flexibility.
Prerequisite: HPF 168

HPF 277 Stress Management (2 CR)
Examine current information and techniques related to stress management. Students learn basic concepts and skills related to the holistic management of stress. **Prerequisite: ENG 085***

HPF 283 Managing Stress and Holistic Health (3 CR)
This course provides students with a holistic approach to health focusing on competencies to manage stress. Students learn the relationship of lifestyle to their health. Through the reflective use of specific skills, tools and new knowledge students have an increased opportunity to enhance their lives and the lives of those around them.
Prerequisites: ENG 085* and ENG 090*

HUMANITIES (HUM)

HUM 131 Cultural Connections (3 CR)
This interdisciplinary course examines contemporary issues, their human and technological components, and their historical precedents through art, music, literature and philosophy.
Prerequisites: ENG 085* and ENG 131

LICENSED PRACTICAL NURSING (LPN)

LPN 131 Foundations of Nursing (6 CR)
Introduction to the nursing process and their role as caregiver. Maslow's hierarchy of needs is explored, along with nursing skills that meet basic physiologic and safety needs. Laboratory and clinical experience provide the student an opportunity to demonstrate initial application of the roles of caregivers and member of the discipline in a highly structured, supervised setting.

LPN 132 Medications (3 CR)
Introduction to the purpose, use and action of medication in meeting basic human needs. Safety and legal implications discussed. Nursing process serves as the framework for understanding client needs during medication therapy.
Prerequisites: BIO 155 or BIO 253 and BIO 254, LPN 141 or MOA 141 and MTH 098* or higher.

LPN 141 Body Structure & Function (4 CR)
(SAME AS MOA 141)
This course is a body systems approach to the body structures and functions providing a foundation of understanding normal and abnormal body functions and disease processes. **Prerequisite: ENG 085***

LPN 145 Normal/Therapeutic Nutrition (3 CR)
(SAME AS MOA 145 AND NUR 207)
Basic nutritional concepts are presented with emphasis on application to patient care. Selected nutritional disorders and fundamentals of diet therapy are also included. **Prerequisite: ENG 085***

LPN 180 Nursing Care of Adults – IA (6 CR)
Use the nursing process to implement the caregiver role with adult clients experiencing basic physiologic needs. Understanding of how disease states of various body systems (respiratory, gastrointestinal, endocrine and immune) alter the client's needs and their ability to meet their needs explored. Clinical experience provides the student the opportunity to demonstrate the roles of caregiver and member of the discipline.
Prerequisites: LPN 131 and MOA 120

LPN 181 Nursing Care of Adults – IB (6 CR)
Use the nursing process to implement the caregiver role with adult clients experiencing basic physiologic needs. Understanding of how disease states of various body systems (gastrointestinal, mental health, respiratory, cardiac valves, hematopietic) alter the client's needs and their ability to meet these needs explored. Clinical experience provides the opportunity to demonstrate the roles of caregiver and member of the discipline. **Prerequisites: LPN 131 and MOA 120**

LPN 182 Role of the Practical Nurse (2 CR)
Review the ethical/legal responsibilities of the LPN along with the scope of practice of the LPN. Issues related to types of health care organizations, LPN organizations, continuing education and licensure covered. Students learn how to prepare for and take the NCLEX-PN examination. Information on home management, resume preparation and job seeking skills included.
Prerequisites: LPN 180 and LPN 181

LPN 183 Nursing Care of Adults – II (6 CR)
Use the nursing process to implement the caregiver role with adult clients experiencing oncology, immune, renal, sensory, reproductive and musculoskeletal health conditions. Maslow's hierarchy of needs is utilized as the framework for understanding client responses to disease states. Emphasis placed on the special needs of elderly clients. Clinical experiences are designed to reinforce theory and demonstrate the roles of caregiver and member of the discipline.
Prerequisites: LPN 180 and LPN 181

LPN 184 Maternal/Child Concepts (6 CR)
Extend the use of the nursing process to the childbearing and childrearing clients. Maslow's hierarchy of needs is utilized as a framework to care for the client who has a well-defined health care problem in a structured setting. Includes a clinical setting.
Prerequisites: LPN 180 and LPN 181

You may meet this prerequisite based on your course placement, ACT score or successful college coursework. Visit our web site for current assessment options and requirements.

MANUFACUTRING TECHNOLOGY (MFG)

MFG 005 Technical Problem Solving (2 CR)
This course provides instruction in a systematic approach to corrective action.

MFG 015 Moldmaking (3 CR)
A course designed to present the moldmaker trainee with the fundamentals of mold design and construction.

MFG 020 Robotics & Material Handling (2 CR)
This course provides an introduction to automated materials handling/production equipment and the role of the computer/robotics in modern manufacturing systems.

MFG 025 Basic Computer Skills (3 CR)
This course is designed to make the manufacturing apprenticeship student computer literate. Systems concepts are introduced with an emphasis on software utilization. This course is divided into two sections: a lecture section and a lab section. This course covers computer system concepts with an emphasis on several software applications.

MFG 050 Basic Math (2 CR)
Review of basic arithmetic as required for manufacturing applications: addition, subtraction, multiplication and division of fractions and decimals. Students will work with problems involving percentages, ratios, proportions, square roots and tapers.

MFG 055 Algebra for Manufacturing (2 CR)
This course will cover basic elementary algebra as required for manufacturing applications. Topics will include: fundamental operation of positive and negative numbers, grouping symbols, algebraic axioms, equations, special products, factoring, quadratic equations and solutions of practical problems.

MFG 060 Geometry for Manufacturing (2 CR)
Review of arithmetic and algebra. Introductory geometry including: axioms, theorems, propositions, dealing with straight lines, triangles, polygons, and circles.

MFG 065 Trigonometry for Manufacturing (2 CR)
In this class students will cover the use of trigonometric tables, solution of right angle problems, solution of oblique triangle problems, use of sine, cosine, tangent and their reciprocals in the solution of unknown angles in practical shop problems.

MFG 105 Blueprint Reading (2 CR)
This course will provide the student with a working knowledge and understanding of a variety of mechanical and electrical blueprints. Students will learn to recognize and identify symbols and specifications common to modern industrial blueprints. Topics will include: lines and symbols, views, form, position, title blocks, sketching, features and sections.

MFG 115 GD & T (2 CR)
This course will provide the student with a working knowledge and understanding of dimensioning and tolerancing for specific design requirements on engineering drawings. Students are exposed to symbols, terms, datums, material conditions, form, profile, orientation, runout and location tolerances. Content includes use and understanding of the symbolic method of specification relating to tolerances being applied using ANSI Y14.5M.

MFG 120 Jig & Fixture Design (3 CR)
This course helps the student develop a thorough understanding and working knowledge of how and why jigs and fixtures are designed and built as they are. To do this the discussion starts with the fundamentals of jigs and fixtures and works through the various elements and considerations of design. Two fundamental tool design principles are constantly stressed: simplicity and economy. Design sketching is used to allow the student to demonstrate an understanding of the theories presented.

MFG 125 Die Theory & Design (3 CR)
A course designed to present the proper steps to designing a die, the ability to read die design layouts, tolerancing, and clearance fits as they apply to this topic. The student will also be provided with a basic understanding of the essential principles of cutting and forming operations as well as die components used for these operations. Also presented will be how to repair and maintain the equipment common to the die industry.

MFG 150 Machining Theory & Methods (4 CR)
This course instructs students in machine tool principles and practices used in industry. Safety, terminology, manual milling, lathe, grinding, drilling, basic CNC, measurement and various shop procedures are used to complete projects. A working knowledge of hand and machine tools is achieved through a series of lectures, demonstrations and hands-on projects.

MFG 155 Machinery Handbook (2 CR)
The Machinery's Handbook is the recognized source of information for the metal working industry. This course will familiarize each student with the effective utilization of the information contained there.

MFG 160 Materials/Metallurgy (2 CR)
This course will provide the student with a working knowledge of the properties, uses and treatment methods used to alter the properties of commonly used metals and alloys. This knowledge may be applied to the design, selection, processing and testing of metal parts.

MFG 165 Precision Machining Methods (4 CR)
This course instructs students in machine tool principles and practices used in industry. Safety, terminology, manual milling, lathe, grinding, drilling, basic CNC, measurement and various shop procedures are used to complete projects. A working knowledge of hand and machine tools is achieved through a series of lectures, demonstrations and hands-on projects.

MFG 170 Hydraulics/Pneumatics (4 CR)
This course provides instruction in the basics of hydraulic and pneumatic systems including pumps, valving, control assemblies and actuators. Provides a general understanding of basic laws and formulas used in simple hydraulic circuits, including standard hydraulic symbols, and maintenance procedures.

MFG 175 CNC Theory & Programming (2 CR)
This course covers CNC set-up and operation. This is an introduction course that will cover basic G&M-code programming.

MFG 180 EDM Theory (3 CR)
A course designed to present the machinist trainee with the fundamentals of electrical discharge machining.

MFG 185 Maintenance & Troubleshooting (3 CR)
Covers methods and means used to troubleshoot and maintain machines typically found in a manufacturing environment. Problem symptoms, problem identification, maintenance records and systems will be covered.

MFG 190 Drive Components & Bearings (2 CR)
This course instructs students in the principles, applications, and maintenance of various types of bearings and mechanical couplings, including ball and roller, powdered metal, nonmetallic, hydrostatic bearings, couplings, such as shear, torque limiting, floating and insulated, speed reducers, seals and gears.

MFG 200 Basic Gauges & Measurement (2 CR)
This course provides instruction in inspection tools and inspection procedures commonly used in manufacturing.

MFG 255 Basic PLC (4 CR)
This is a basic programmable controllers course designed for apprentices and skilled trades trainees looking at the history, characteristics, application and limitation of PLCs. Numeration systems, binary-coded decimals, ASCII, gray code and Boolean logic is studied. Additional study includes input/output devices, processing and programming functions, program development, documentation, start-up and troubleshooting.

MFG 260 Industrial Wiring (3 CR)
This class will cover practical applications of Industrial Electrical Wiring. The course will start with codes, standards and electrical prints. The course will then move on to the safe use of hand tools and power tools used in the industry. Also, materials used in the industrial environment and how to determine correct wire size and voltage levels will be determined. Finally the installation of equipment and repairs will be explored.

MEDICAL ASSISTANT (MOA)

MOA 111 Medical Assistant Techniques I (3 CR)
Through class and laboratory practice the student will learn clinical practices, procedures and routines performed by the medical assistant. The medical assistant's role in the preparation for assisting with examination and treatment of the patient, basic techniques in taking vital signs, medical asepsis, office emergencies, wound care, mobility training, accommodation for patients with disabilities, assisting with office surgery and documentation are emphasized.
Prerequisite: BIO 155 or BIO 253, LPN 141 or MOA 141

MOA 112 Insurance, Reports, Law & Ethics (3 CR)
Principles and concepts of medical law and bioethics, as well as an overview of health care financing through third party payers are the main focus of this course. Topics include: medical practice management medical law, liability and malpractice prevention, health information management, HIPAA and confidentiality of patient information, employment practices, consent, billing collections, insurance and government healthcare programs, codes of ethics and contemporary bioethical issues.

MOA 120 Medical Terminology (3 CR)
A programmed learning word building system approach is used to teach basic medical terminology word roots, prefixes, suffixes, language origins, plural formation and grammar rules are studied. Emphasis is placed on word building, definitions, spelling, usage, pronunciation and acceptable medical abbreviations.
Prerequisite: ENG 085*

MOA 141 Body Structure & Function (4 CR)
(SAME AS LPN 141)
This course is a body systems approach to the body structures and functions providing a foundation of understanding normal and abnormal body functions and disease processes. **Prerequisite: ENG 085***

MOA 145 Normal/Therapeutic Nutrition (3 CR)
(SAME AS LPN 145 AND NUR 207)
Basic nutritional concepts are presented with emphasis on application to patient care. Selected nutritional disorders and fundamentals of diet therapy are also included. **Prerequisite: ENG 085***

MOA 204 Seminar & Externship (5 CR)
225 hours non-paid externship with a licensed healthcare practitioner, in a medical office, or clinic. This capstone medical assistant course provides an opportunity for practice of basic medical assistant skills and application of knowledge of administrative, clinical and trans-disciplinary competencies.
Prerequisites: MOA 111, MOA 211, MOA 240, and MOA 241

MOA 211 Medical Assistant Techniques II (4 CR)
Through class and laboratory, clinical skills are practiced and knowledge applied. OSHA standards, CLIA laws, EKG, medication administration, phlebotomy, and lab specimen collection, microscopy, medical lab testing and assisting in gynecology, obstetrics, urology, pediatrics, respiratory therapy, family practice and use of community resources are emphasized.
Prerequisites: MOA 141, LPN 141 or BIO 155 or BIO 253 and MOA 120

MOA 230 Medical Machine Transcription (3 CR)
Students are introduced to medical correspondence and report transcription using computerized word processing and machine transcribers. Emphasis is placed on correct English usage, medical terminology, spelling, punctuation, report form, and word processing techniques. Keyboarding skills are essential.
Prerequisites: MOA 120, CIS 101, and MOA 141, LPN 141 or BIO 155 or BIO 253

MOA 235 Advanced Medical Machine Transcription (3 CR)
Building upon skills learned in MOA 230, this course moves the transcription student though more complicated and diverse medical specialty report dictation including ophthalmology, orthopedics, neurology, mental health, and history and physical exam. Speed, accuracy and quality are emphasized. **Prerequisite: MOA 230**

MOA 240 Medical Office Procedures (3 CR)
Through written and computerized medical office simulations the student will learn basic concepts and medical administrative practices. Topics include: medical office health information management, oral and written communication skills, patient account management, peg-board accounting, electronic transmission of data, machine transcription of dictation, preparation of correspondence, understanding document content and use, reception and telephone etiquette, appointment scheduling and legal issues.
Prerequisites: MOA 112, MOA 120, ENG 131 and CIS 101

MOA 241 Medical Records (3 CR)
Study principles and practices in health information management as it relates to documentation for medical billing. Introduction to ICD and CPT coding, private insurance, and government program claim processing, legal and healthcare finance issues, HIPAA and release of information guidelines are emphasized.
Prerequisites: MOA 120 and MOA 112

MOA 242 Advanced Medical Billing (3 CR)
Designed to teach advanced skills in medical insurance billing. Correct preparation of major carrier claims including use of modifiers and rebilling skills emphasized.
Prerequisite: MOA 241

MOA 245 Billing/Transcript Externship (3 CR)
150-hour non-paid externship experience in a medical setting as appropriate to practice receptionist and billing or transcription skills. Weekly seminar meetings include: guidance and discussion of placement experiences, documentation and evaluation of externship activities and job search skills.
Prerequisites: MOA 240 and MOA 241

MATHEMATICS (MTH)

MTH 095 Basic Mathematics (4 CR)
Provides the most fundamental support for students who need to develop skills in the arithmetic of whole numbers, fractions, decimals, signed numbers and metric measurement.

MTH 098 Pre-Algebra (4 CR)
Review of arithmetic of positive and negative integers, fractions, decimals, percentages. Covers measurement and geometric calculations and basic algebraic concepts include simplifying expressions and solving simple equations.
Prerequisite: MTH 095*

MTH 120 Beginning Algebra (4 CR)
Study variables and variable expressions, integers, laws of exponents, equations (linear, quadratic, rational, radical and absolute value), linear inequalities, linear systems, coordinate graphing and problem solving.
Prerequisite: MTH 098*

MTH 131 Intermediate Algebra (4 CR)
Emphasizes simplifying expressions, solving equations, and graphing functions, including linear, quadratic, polynomial, rational, radical, exponential and logarithmic. Problem solving and mathematical modeling are integrated throughout. Appropriate technology includes a graphing calculator. **Prerequisite: MTH 120***

MTH 133 Introduction to Probability & Statistics (3 CR)
(SAME AS CIS 205, PSY 143)
Introduction to basic descriptive statistics, probability theorems, frequency distributions and functions, binomial and normal probability distributions and functions, probability density functions, hypothesis testing, statistical inference, Chi-square analysis, linear regression and correlation. **Prerequisite: MTH 131***

MTH 140 Pre-Calculus (5 CR)
Major emphasis is on the concept of functions. Study polynomial, rational, exponential, logarithmic, trigonometric and inverse trigonometric functions, their properties, graphs, and related equations and applications. Additional topics include systems of equations, matrices, conic sections, sequences and series, and probability. A graphing calculator is required and used extensively. **Prerequisite: MTH 131***

MTH 145 Finite Mathematics (4 CR)
This course is for students whose programs do not require trigonometry or the calculus sequence. The topics that will be included are linear, exponential, quadratic, polynomial and logarithmic functions and models; systems of linear equations; linear regression; mathematics of finance and financial modeling; matrices, linear programming; permutations; combinations, probability theory; probabilistic simulations; decision theory; descriptive statistics; and Markov chains.
Prerequisite: MTH 131*

MTH 151 Calculus I (4 CR)
First calculus course for business, mathematics, engineering and science students explores introductory plane analytic geometry, the derivative, the integral and their applications for algebraic, trigonometric, exponential and logarithmic functions. Graphing calculator required. **Prerequisite: MTH 140***

MTH 154 Calculus II (5 CR)
Explore the following topics: methods and applications of the derivative and integral for inverse trigonometric and hyperbolic functions, indeterminate forms, series, polar and parametric representation of functions, matrices, determinants, solution of systems of equations and vectors. Graphing calculator required.
Prerequisite: MTH 151*

MTH 210 Foundations of Mathematics (3 CR)
Provides background material for students preparing to teach at the elementary level. Emphasizes the structure and properties of the number system. Covers concepts, models and algorithms for whole numbers, integers, fractions, decimals and percents. Some additional hours of on-site field work required. **Prerequisite: MTH 131***

MTH 211 Foundations of Mathematics II (3 CR)
The course will provide the second semester of math content for elementary education majors. It is a continuation course for MTH 210, Foundations of Mathematics I. **Prerequisite: MTH 210**

MTH 251 Calculus III (4 CR)
Solid analytical geometry is integrated throughout this course covering the calculus of vector valued functions, multivariable functions, and vector fields with applications. Also covers linear algebra topic of vector spaces. Graphing calculator required.
Prerequisite: MTH 154

MTH 254 Differential Equations (4 CR)
Explore solutions of first order differential equations, linear differential equations with constant coefficients, variation of parameters, series solutions, Laplace transforms, eigenvectors and eigenvalues and application to solution of systems of linear first order equations. Graphing calculator required. **Prerequisite: MTH 154**

MUSIC (MUS)

MUS 103 Keyboard I (2 CR)
Sequence of courses that teach music reading and performance on piano. The course stresses functional keyboard skills.

MUS 104 Keyboard II (2 CR)
Sequence of courses that teach music reading and performance on piano. The course stresses functional keyboard skills. **Prerequisite: MUS 103**

MUS 105 Keyboard III (2 CR)
Sequence of courses that teach music reading and performance on piano. The course stresses functional keyboard skills. **Prerequisite: MUS 104**

MUS 106 Keyboard IV (2 CR)
Sequence of courses that teach music reading and performance on piano. The course stresses functional keyboard skills. **Prerequisite: MUS 105**

MUS 107 Guitar I (2 CR)
Beginner class instruction in playing folk and classical guitar. Each student provides own guitar.

MUS 108 Guitar II (2 CR)
Continuation of MUS 107.
Prerequisite: MUS 107

MUS 123 Voice Class (2 CR)
Designed to aid in vocal techniques and develop stage presence. Topics include breathing techniques, vocal evaluation, developing a personal style and working with a microphone. Repeatable two times for credit.

MUS 124 Advanced Voice Class (2 CR)
Sequence of Voice Class, MUS 123. Class continues the development of vocal technique, with emphasis on performance. Repeatable two times for credit.
Prerequisite: MUS 123

MUS 129 Community Concert Band (1 CR)
Study and performance of concert band music performances. Admission with department permission required. Repeatable four times for credit.

MUS 130 Music of Non-Western Cultures (3 CR)
Discovering the music of non-western cultures through lecture and directed listening.
Prerequisite: ENG 085*

MUS 131 Understanding Music (3 CR)
Lecture and directed listening on the elements, forms, and historic chronology of Western music.

MUS 132 History of American Popular Music (3 CR)
Students explore the development of popular music in America and focus on the musical, social and economic influences of commercial music in an historical context.

MUS 133 Music Education (3 CR)
Elementary education student is taught the fundamentals of music and then given practical experience in teaching, creating, and accompanying songs and how to enhance an elementary classroom with music.

MUS 135 African Drum Ensemble (2 CR)
Performance of African (Ashante) drums. Rehearsals with cultural exploration leading to performances of the music. Repeatable four times for credit.

MUS 136 Brass Ensemble (2 CR)
Performance of music for brass chamber ensembles. Repeatable four times for credit.

MUS 137 Jazz Ensemble (2 CR)
Performance of jazz with emphasis on improvisational skill development. Repeatable four times for credit.

MUS 138 Woodwind Ensemble (2 CR)
Performance of woodwind chamber ensemble music. Repeatable four times for credit.

MUS 151 Music Theory I (4 CR)
Study of scales, key signatures, chord structure, intervals, chord progression and non-harmonic tones. This course includes sight singing, keyboard harmony and ear training.

MUS 152 Music Theory II (4 CR)
Continued study of scales, key signatures, chord structure, intervals, chord progression and non-harmonic tones. This course includes sight singing, keyboard harmony and ear training.
Prerequisite: MUS 151

MUS 161 Audio Production (3 CR)
Course covers recording technique, the studio, multi-track recording, mixing, rhythm tracks, lead and instrumental overdubs, guide tracks, mix down, editing, and sound reinforcement.

MUS 167 Applied Music (1 CR)
Private instrument lessons are open to all students at the start of the semester. Students contact the music department which assists in locating a private instructor. Students pay for both lessons and college credit.

MUS 168 Applied Music (1 CR)
Private instrument lessons are open to all students at the start of the semester. Students contact the music department which assists in locating a private instructor. Students pay for both lessons and college credit. **Prerequisite: MUS 167**

MUS 177 Applied Music (2 CR)
Private instrument lessons are open to all students at the start of the semester. Students contact the music department which assists in locating a private instructor. Students pay for both lessons and college credit. **Prerequisite: MUS 168**

MUS 178 Applied Music (2 CR)
Private instrument lessons are open to all students at the start of the semester. Students contact the music department which assists in locating a private instructor. Students pay for both lessons and college credit. **Prerequisite: MUS 177**

MUS 190 Broadway Revue (1 CR)
Study and perform Broadway, jazz and popular vocal literature. The performance aspect includes singing, stage presence, staging and movement. This ensemble rehearses a total of three to four hours per week. Audition is required. Repeatable four times for credit.

MUS 267 Applied Music (1 CR)
Private study on all instruments is open to all students. This is a requirement for music majors pursuing a bachelor's degree. All students must register with music department at the beginning of each semester. Recital and jury required.
Prerequisites: MUS 168 or MUS 178

You may meet this prerequisite based on your course placement, ACT score or successful college coursework. Visit our web site for current assessment options and requirements.

NATURAL SCIENCE (NSC)

NSC 131 Contemporary Science (4 CR)
An interdisciplinary course that introduces the nature of science as a process. Particular topics from biology, chemistry, physics, geology and astronomy covered with an emphasis on critical thinking and evaluating evidence to examine competing theories. The interrelationships and interaction of the sciences are stressed, as is the relationship of science and technology. This course is ideal as a first science course for students whose science background is minimal, who are anxious about science, or who have not had a science course for several years. Course includes a laboratory component.
Prerequisites: ENG 090* and MTH 098* or higher

NURSING (NUR)

NUR 101 Fundamentals of Nursing (6 CR)
Become familiar with the nursing process as it relates to universal self-care requisites. Assistance is provided in acquiring and demonstrating competency in basic nursing skills. Emphasis is placed upon assessing self-care agency and therapeutic self-care demand. That information is then used to devise appropriate nursing diagnosis, to plan, implement and evaluate a plan of care for clients requiring nursing actions to meet their universal self-care demands. Laboratory and clinical experiences are included.

NUR 103 Introduction to Professional Nursing (4 CR)
Provides a foundation in the scientific and social dimension of nursing as a discipline and a health profession. Examine the historical development of nursing and its impact on contemporary nursing. Cultural variables and personal values examined by the student. The societal context of nursing is reviewed, providing the student with an appreciation of the health care system, with particular emphasis on legal and ethical frameworks.

NUR 119 Transition Bridge Theory (4 CR)
Become familiar with the nursing processes related to professional delivery of nursing care for clients with medical, surgical, obstetrical and pediatric health deficits. Exploration of legal and professional practice and transition to the RN role. Development of comprehensive health assessment concepts and physical assessment techniques. Didactic review of Family I concepts.

NUR 121 Pharmacology (3 CR)
Students are introduced to basic knowledge and skills needed to safely administer medications to clients with self-care needs. This course includes medication action, use, side effects, nursing implications and client education for major drug groups.
Prerequisites: BIO 155 or BIO 253 and BIO 254 or LPN 141 or MOA 141 and MTH 098* or higher.

NUR 170 Self-Care (1 CR)
Students will be introduced to Orem's theory of self-care. The theory of self-care deficits and theory of nursing systems discussed as they relate to the clients, as well as to the students. Students use a variety of methodologies, which will then be a part of their repertoire of self-care knowledge and skills.

NUR 171 Supportive Educative Nursing (4 CR)
Apply the nursing process to promote self-care for adults with common, well-defined needs. This course explains problems of the client needing supportive-educative care. Clinical experience designed to reinforce the theory included.
Prerequisites: NUR 121, NUR 101 and NUR 170

NUR 172 Pathophysiology (4 CR)
Study of human diseases and the mechanisms that govern them. Addresses etiology, clinical presentation and appropriate treatment of disease processes and nursing action.
Prerequisites: BIO 155 or BIO 253 and BIO 254 and NUR 101 or NUR 119

NUR 173 Family I (4 CR)
Focus on family centered care utilizing the maternal child health standards. This course utilizes the self-care model and the nursing process as the framework to assist the student in collaborating with the client/family or other health care members in meeting the supportive-educative needs of the client/family in childrearing and childbearing experiences.
Prerequisites: PSY 252, NUR 101, NUR 121 and NUR 170

NUR 207 Normal/Therapeutic Nutrition (3 CR)
(SAME AS MOA 145 AND LPN 145)
Basic nutritional concepts are presented with emphasis on application to patient care. Selected nutritional disorders and fundamentals of diet therapy are also included. **Prerequisite: ENG 085***

NUR 242 Physical Assessment (1 CR)
Designed for nurses to learn physical assessment skills including inspection, palpation, percussion and auscultation. Included are interviewing techniques and assessment of cardiac, musculoskeletal, gastrointestinal, neurological and respiratory systems.

NUR 245 Health Assessment (3 CR)
This course is designed to provide an organized approach to client interviewing, health history information and documentation in the assessment process. A systematic method to physical assessment utilizing inspection, palpation, percussion an auscultation for all body systems is conceptualized and practiced in a controlled lab setting.

NUR 270 Partially Compensatory (4 CR)
Apply the nursing process to promote self-care for clients with chronic health needs. Explores problems of the "partially compensatory" elderly client. Clinical experience is provided in the hospital and community.
Prerequisites: NUR 171, NUR 172, and NUR 173 or NUR 120

NUR 271 Family II (4 CR)
Further develop the self-care model by utilizing the nursing process to assist clients/families with complex self-care demands and deficits. It also explores the relationship of dependent care agents and nursing systems and includes clinical experiences with children, childbearing and childrearing clients, designed to reinforce theory.
Prerequisites: NUR 171, NUR 172 and NUR 173 or NUR 120

NUR 272 Mental Health (5 CR)
Explore learning experiences that promote satisfactory assimilation of fundamental mental health and mental illness concepts in their delivery of the nursing process with clients and family systems. A clinical component is provided for students to develop mental health nursing care skills.
Prerequisites: NUR 171, NUR 172, and NUR 173 or NUR 120

NUR 273 Wholly Compensatory (5 CR)
Utilize the nursing process to provide wholly compensatory care for clients. Caring for clients requiring complex nursing interventions, medical regimens and includes clinical in acute care settings.
Prerequisites: NUR 270, NUR 271 and NUR 272

NUR 274 Leadership (4 CR)
Focus on the role changes from student to graduate and examine the nurse agent's role in a leadership position, as well as responsibility, accountability and liability in a health care setting. Current health care trends which impact the client's self care examined. Stresses continued skill development and includes clinical experience.
Prerequisite: NUR 273

PHILOSOPHY (PHL)

PHL 231 Introduction to Philosophy (3 CR)
In this course, you will be exposed to some of the major figures in Western philosophy, and through them, some of the most important philosophical questions. You will discuss questions such as: Is ethics all a matter of opinion? What is the good life for human beings? When is the state justified in using coercive power? What is the nature of knowledge, and how do we get knowledge? What is the nature of reality? Can we prove the existence of God?
Prerequisites: ENG 085* and ENG 090*

PHL 232 Logic (3 CR)
This course gives you a background in both informal and formal logic. Informal logic, which is derived from everyday types of discussions and arguments, is dealt with first. Topics included are the nature of arguments in general, statistical arguments, and fallacies (bad arguments). Formal logic involves dealing with arguments in an artificial language and is the ancestor of digital computers and every computer programming language. You will learn how to manipulate the artificial language and construct relatively simple proofs. **Prerequisites: ENG 085* and ENG 090***

PHL 236 Ethics (3 CR)
In this course, students will examine various questions concerning the status of ethical judgments and become familiar with certain approaches to ethics that have been influential in Western philosophy, including Kantian ethics, utilitarianism and virtue-based ethical theories. In addition, students will consider how these approaches can be employed in ethical decision-making.
Prerequisite: ENG 131

PHL 243 Great World Religions (3 CR)
Students examine the literature and historical settings of great world religions. The relationship of contemporary thought is considered for representative groups.
Prerequisites: ENG 085* and ENG 090*

PHYSICS (PHY)

PHY 131 Conceptual Physics (4 CR)
Become familiar with basic concepts used in physics to describe and explain various physical phenomena. The course covers the following topics: kinematics (the description of motion); mechanics (the study of force, momentum, and energy); the behavior of solids, liquids and gases; temperature and heat; waves and sound; electricity and magnetism; and optics. The course is designed to familiarize the student with the basics of physics using a minimum of mathematics. Course includes a laboratory component.
Prerequisites: ENG 085* and MTH 098* or higher

PHY 151 Astronomy (4 CR)
This is a descriptive course, primarily for non-science majors, covering the general field of astronomy. Topics include telescopes, motions of the sky, planetology, stellar evolution and cosmology. Course includes a laboratory component.
Prerequisites: ENG 085* and MTH 120* or higher

PHY 161 Industrial Physics (2 CR)
Physical principles of mechanics and heat and their applications to machines, liquids, gases, structural materials, laws of moving bodies, heat control and heat engines.

PHY 231 College Physics I (4 CR)
Pre-professional and engineering technology students explore kinematics, mechanics, dynamics, thermodynamics, acoustics and general wave motion. Course includes a laboratory component. **Prerequisite: MTH 131 or higher**

PHY 232 College Physics II (4 CR)
Students cover topics in electricity, magnetism and modern physics and is a continuation of PHY 231. Course includes a laboratory component.
Prerequisite: PHY 231

PHY 251 Modern University Physics I (5 CR)
Students cover classical mechanics,thermodynamics and wave motion. This course should be elected by all science and engineering students.
Prerequisite: MTH 151 or higher

PHY 252 Modern University Physics II (5 CR)
Students cover topics in classical electricity and magnetism, optics, special relativity and modern physics. A continuation of PHY 251.
Prerequisite: PHY 251

POLITICAL SCIENCE (PLS)

PLS 141 American National Government (3 CR)
Develops a systematic framework for the interpretation of political activity in the United States. Numerous models explain the theoretical foundations of government and the decision-making process.
Prerequisites: ENG 085* and ENG 090*

PLS 262 International Relations (3 CR)
Survey contemporary world affairs and examine the nation-state system, the struggle for power, and factors creating harmony and hostility among states.
Prerequisites: ENG 085* and ENG 090*

PSYCHOLOGY (PSY)

PSY 140 Introduction to Psychology (4 CR)
Overview of the field of psychology, including learning, development, emotion, motivation, personality, abnormal behavior and psychotherapy.
Prerequisites: ENG 085* and ENG 090*

PSY 143 Introduction to Probability & Statistics (3 CR)
(SAME AS MTH 133, CIS 205)
Introduction to basic descriptive statistics, probability theorems, frequency distributions and functions, binomial and normal probability distributions and functions, probability density functions, hypothesis testing, statistical inference, Chi-square analysis, linear regression and correlation. **Prerequisite: MTH 131**

PSY 152 Social Psychology (3 CR)
(SAME AS SOC 152)
Theoretical synthesis of social influences, including attitude formation, social and cognitive development, aggression, prosocial behavior, prejudice, conformity, culture and gender differences, influences, group processes and interpersonal attraction.
Prerequisite: PSY 140 or SOC 231

PSY 161 Introduction to Counseling (3 CR)
Learn basic counseling microskills against a backdrop of comparative theories and systems of counseling. Ethical, legal and practical issues included. **Prerequisite: PSY 140**

PSY 222 Applied Behavior Analysis (3 CR)
Methods and techniques for changing behaviors based on learning principles. Includes modeling, simulation, role playing, operant, aversion, fear reduction and self-management methods.
Prerequisite: PSY 140

PSY 245 Infancy and Childhood (3 CR)
Physical, mental, emotional and social development of the human individual from conception through childhood. Genetic, prenatal and postnatal influences on development are examined. Cognitive and social learning theories are used to integrate research findings.
Prerequisite: PSY 140

PSY 251 Abnormal Psychology (3 CR)
Survey of those behaviors that do not fit the norm of society, including causal factors, specific disorders and treatment methods.
Prerequisite: PSY 140

PSY 252 Developmental Psychology (3 CR)
Principles and theories of human development from conception through adulthood, with applications to foster optimal development. Cognitive, behavioral and social learning theories are used to integrate research findings. **Prerequisite: PSY 140**

PSY 256 Educational Psychology (3 CR)
Application of psychological theories to the teaching-learning process. Principles of cognitive and social development discussed along with discipline, motivation and assessment and evaluation.
Prerequisites: ENG 085* and ENG 090*

PSY 290 Human Sexuality (3 CR)
Physiological, psychological and sociocultural influences on human sexuality, including gender, sexual maturation and behavior, identity, values, orientation, relationships, sexually transmitted diseases, sexual disorders and therapy.
Prerequisite: PSY 140

RADIOGRAPHY (RAD)

RAD 120 Radiologic Orientation (2 CR)
The fields of radiologic technology are presented in this course. Hospital and medical clinical personnel, departments, history, hierarchy, development, means and methods of operation are studied with emphasis on the moral, legal and professional rights and responsibilities of the radiographer. Basic radiation protection is presented.

RAD 121 Radiographic Positioning I (4 CR)
A study of proper methods and types of equipment used in positioning for radiographic examinations, interpretation of radiologic request, related positioning terminology, and special positioning variations due to patient age and condition. Anatomy and positioning for the upper and lower extremities, chest, thoracic cage and abdomen are presented. Lab experience is utilized to emphasize course material. Methods of radiation protection are demonstrated. Lab included.

RAD 125 Radiographic Positioning II (4 CR)
Continuation for RAD 121, Radiographic Positioning I. Anatomy and positioning for the skull with related anatomical regions and parts, digestive, urinary, respiratory and spinal column are presented. Lab experiences are used to emphasize course material. Methods of radiation protection are demonstrated and emphasized. Lab included. **Prerequisite: RAD 121**

RAD 126 Clinical Practicum I (3 CR)
Clinical experience is provided in this course under the direct supervision of ARRT-registered radiographers. Clinical competencies will be given corresponding to the exams completed in the classroom. Performance standards are used to evaluate the student's progress.
Prerequisite: RAD 121

RAD 160 Fundamentals of Radiologic Science (4 CR)
Emphasis is on the application of fundamentals to the practice of diagnostic imaging. The course relates the principles of electricity, magnetism, electromagnetic energy, x-ray interaction with matter, radiation protection and the x-ray machine. Emphasis is on the understanding of these principles so as to manipulate a variety of factors to obtain a diagnostic radiograph. A lab experience is utilized to reinforce course content.
Prerequisite: RAD 126

RAD 161 Radiographic Exposure (4 CR)
The essential factors influencing the quality of radiographs will be presented. Exposure factors, accessory devices, various pathological influences, geometric influences, and recording media are presented. Energized laboratory experience will be performed to teach and reinforce learning. Radiation protection methods are studied. Lab included.

RAD 162 Clinical Practicum II (3 CR)
Continuation of Clinical Practicum I.
Prerequisite: RAD 126

RAD 210 Clinical Practicum III (5 CR)
Continuation of Clinical Practicum II.
Prerequisite: RAD 162

RAD 212 Special RAD Studies (4 CR)
A more detailed study of special radiographic procedures performed in the radiology department. The course will investigate myelograms, arthrography, sialography, venography, arteriography and intervention procedures, as well as other specialized imaging modalities.
Prerequisite: RAD 160

RAD 213 Radiobiology (2 CR)
Students review the basics of cell biology and study the basic biologic interaction of radiation. That study will include cellular and tissue response to radiation, as well as radiation pathology, the total body radiation response, and the late effects of radiation. It will conclude with a discussion of clinical radiobiology that includes diagnostic radiology, nuclear medicine and therapeutic radiology. **Prerequisite: BIO 132 or BIO 155 or BIO 253**

RAD 214 Clinical Practicum IV (5 CR)
Continuation of Clinical Practicum III.
Prerequisite: RAD 210

RAD 218 Radiographic Pathology (3 CR)
A survey of medical-surgical diseases and the body's natural means of reacting to such diseases. The immune process, inflammatory response process, traumatic and pathologic disturbances, and the natural homeostasis process are presented. Basic congenital abnormalities and normal growth are discussed. Pathologic conditions are related to the effect they have on the imaging process.
Prerequisite: BIO 132 or BIO 155 or BIO 253

RAD 219 Clinical Practicum V (5 CR)
Continuation of Clinical Practicum IV.
Prerequisite: RAD 214

RESPIRATORY CARE (RES)

RES 100 Respiratory Care Techniques I (7 CR)
This classroom and laboratory course is an introduction to the duties and responsibilities of respiratory care practitioners. Topics covered include a review of physical science, cardiopulmonary anatomy and physiology, cardiopulmonary resuscitation, basic nursing skills, medical gas and aerosol administration, employee health and safety, pulmonary medications, and an orientation to clinical sites.

RES 104 Cardiopulmonary Assessment (2 CR)
This course is an introduction to basic physical and laboratory assessment of cardiopulmonary patients. Topics include basic pulmonary function and medical lab values, blood gas analysis, and bedside patient assessment equipment and techniques.

RES 110 Respiratory Care Techniques II (5 CR)
This classroom and laboratory course continues the introduction to basic duties of respiratory care practitioners. Emphasis will be placed on patient assessment, basic therapy modalities, airway management, cardiopulmonary diagnostic equipment and techniques and an introduction to continuous mechanical ventilation.
Prerequisites: RES 100 and RES 104

RES 114 Cardiopulmonary Pathophysiology I (2 CR)
The student in this course will be able to describe the etiology, pathophysiology, clinical manifestations, diagnosis and management of a variety of cardiopulmonary diseases and processes. Using a series of case studies, student will continue to develop assessment skills and apply Clinical Practice Guidelines to develop care plans for patients with cardiopulmonary disease.
Prerequisites: RES 100 and RES 104

RES 115 Clinical Practice I (5 CR)
This course provides a hospital experience in which previously acquired classroom theory and laboratory skills can be exercised. Skills practiced include those associated with patient respiratory assessment, oxygen therapy, a wide range of bronchopulmonary hygiene therapies, and equipment processing.
Prerequisites: RES 100 and RES 104

RES 120 Respiratory Care Techniques III (6 CR)
Mechanical ventilation topics are continued in this classroom and laboratory course. Topics presented include volume pre-set and pressure pre-set ventilator equipment and basic ventilator application and management techniques for adult patients. **Prerequisites: RES 110 and RES 114**

RES 124 Respiratory Pharmacology (2 CR)
This course provides an overview of general pharmacology with an emphasis on drugs used in the critical care management of cardiopulmonary conditions.
Prerequisites: RES 110, RES 114 and RES 115

RES 125 Clinical Practice II (2 CR)
This clinical course provides three types of experience for the respiratory therapy student. First, there will be a continuation of basic respiratory care modalities from the previous semester. Second, the diagnostic areas of basic pulmonary function testing, arterial blood gas puncture and analysis, and 12-lead electrocardiography will be introduced. Third, the student will receive an orientation to volume control ventilation in the adult ICU environment. In addition, weekly clinic seminars will be held on campus to facilitate student learning.
Prerequisites: RES 110, RES 114 and RES 115

RES 126 Cardiopulmonary Pathophysiology II (2 CR)
The student in this course will be able to describe the etiology, pathophysiology, clinical manifestations, diagnosis and management of a variety of advanced cardiopulmonary diseases and processes. Using a series of case studies, students will continue to develop assessment skills and apply Clinical Practice Guidelines to develop care plans for patients with cardiopulmonary disease.
Prerequisite: RES 114

RES 204 Diagnostic Theory (3 CR)
This course covers pulmonary function testing and blood gas analysis equipment and procedures in the laboratory and clinical settings and includes an emphasis on the interpretation of test results from this equipment. Ventilator graphics, an extension of PFT graphics, and their interpretation will be presented. Additionally, equipment and procedures in common use in the areas of ABG laboratories, cardiopulmonary stress testing, pulmonary rehabilitation, and pulmonary home care will be presented.
Prerequisites: RES 120, RES 125 and RES 126

RES 205 Clinical Practice III (5 CR)
This clinical course allows students to assist in the pulmonary management of adults on mechanical ventilation. An integrated approach to patient care will be stressed through accurate patient assessment and application of various equipment and therapies. Students will also function as members of the health care team.
Prerequisites: RES 120, RES 124, RES 125 and RES 126

RES 208 Advanced Cardiopulmonary Anatomy & Physiology (4 CR)
This course advances the student's knowledge of cardiopulmonary physiology. The cardiac sections cover gross and histologic cardiovascular anatomy, neural/endocrinological control of cardiac function, hemodynamics, microcirculatory disorders, and a review of common cardiac arrhythmias. The pulmonary section covers bronchopulmonary anatomy, gas diffusion, blood flow, ventilation/perfusion relationships, gas transport, mechanics and control of ventilation, and lung responses to changing environments and conditions.
Prerequisites: RES 120, RES 125 and RES 126

RES 210 Perinatal & Pediatric Respiratory Care (3 CR)
This classroom and laboratory course covers topics including fetal growth and development, patient assessment, commonly encountered equipment and the clinical management of common neonatal/pediatric diseases and conditions.
Prerequisites: RES 120 and RES 205

RES 220 Respiratory Seminar (2 CR)
This course presents a wide variety of topics for discussion. Included are respiratory care history, management and supervision, trends in allied health, research, job acquisition skills and credentialing exam preparation.
Prerequisite: RES 210

RES 225 Clinical Practice IV (5 CR)
This clinical course provides a varied experience for students who are about to graduate. A major emphasis will be in assisting with the pulmonary management of neonatal patients on mechanical ventilation. Other rotations will be in a variety to advanced diagnostic laboratories and alternate site venues where respiratory therapist are employed. In addition, weekly clinic seminars will be held on campus to facilitate student learning.
Prerequisite: RES 210

SOCIOLOGY (SOC)

SOC 117 Criminology (3 CR)
(SAME AS CRJ 117)
Provides an understanding of the cultural nature, origin, and development of criminal behavior with attention given to the psychological and sociological factors involved.
Prerequisites: ENG 085* and ENG 090*

SOC 152 Social Psychology (3 CR)
(SAME AS PSY 152)
Theoretical synthesis of social influences, including attitude formation, social and cognitive development, aggression, prosocial behavior, prejudice, conformity, culture and gender differences/influences, group processes and interpersonal attraction.
Prerequisites: PSY 140 and SOC 231

SOC 203 Field Studies (3 CR)
(SAME AS CRJ 203)
Only open to students who have reached sophomore level (26 or more credit hours), a minimum 2.5 GPA and permission of the department. An opportunity for students to work for one semester in a law enforcement agency.

SOC 231 Principles of Sociology (3 CR)
The discipline and its contributions to understanding the fundamental processes of social interaction. Includes development of self, socialization process, groups and social structure. Application of sociological principles to our society by examination of relevant research.
Prerequisite: ENG 090*

SOC 235 Minority Groups in America (3 CR)
Sociology of dominant-minority relations in contemporary American society. Attention to specific ethnic, religious, and racial minorities in terms of prejudice and discrimination.

SOC 236 Women in a Changing Society (3 CR)
(SAME AS ENG 236)
Inquiry into historical and changing roles of women, looking at causes of these changes and their effects on women and society through literature, sociology, biology and history.
Prerequisites: ENG 085* and ENG 131

SPEECH (SPH)

SPH 101 Forensic Intercollegiate (1 CR)
Participate in intercollegiate debate and forensic tournaments.

SPH 102 Forensic Intercollegiate (1 CR)
Participate in intercollegiate debate and forensic tournaments.
Prerequisite: SPH 101

SPH 201 Forensic Intercollegiate (1 CR)
Participate in intercollegiate debate and forensic tournaments.
Prerequisite: SPH 102

SPH 202 Forensic Intercollegiate (1 CR)
Participate in intercollegiate debate and forensic tournaments.
Prerequisite: SPH 201

SPH 231 Communication Fundamentals (3 CR)
Students will learn the basic principles of speech communication including speech development and delivery, interpersonal message, non-verbal messages, and small group dynamics. The course is designed to prepare students to be effective communicators in a diverse global society. Student speeches will be evaluated for effectiveness.
Prerequisites: ENG 085* and ENG 090*

SPH 234 Public Address (3 CR)
Explore the role of the speaker, audience, occasion and the message. Offers opportunities for participation in all general purposes of speech plus some special occasion speeches. Delivery methods are impromptu, extemporaneous, manuscript and memorized. Outlining, organization, delivery technique and other theories of public address stressed.
Prerequisites: ENG 085* and ENG 090*

SPH 240 Interpersonal Communication (3 CR)
Students will learn to improve communication in one-on-one and small group situations. In this course, students will examine basic verbal and non-verbal elements affecting communication between individuals in family, peer group and work contexts. Specific units of discussion include intrapersonal perspective, conflict resolution, self-disclosure, message generation, intercultural messages and non-verbal communication.
Prerequisites: ENG 085* and ENG 090*

SPANISH (SPN)

SPN 131 Elementary Spanish I (4 CR)
Introduces and develops the four skills of language learning: listening, speaking, reading and writing, with special emphasis on listening and speaking.
Prerequisite: ENG 085*

SPN 132 Elementary Spanish II (4 CR)
Provides increased practice in the basic language skills, listening, speaking, reading and writing.
Prerequisite: SPN 131

SPN 231 Intermediate Spanish I (4 CR)
Improves the basic skills of language learning with emphasis on speaking and writing. Introduces sustained readings in Spanish.
Prerequisite: SPN 132

SPN 232 Intermediate Spanish II (4 CR)
Continues to stress speaking practice and writing improvement. Readings and discussions in Spanish, focusing on contemporary events and Hispanic culture. **Prerequisite: SPN 231**

THEATRE (THR)

THR 102 Theatre Activities (1 CR)
Students are actively involved in creating, producing, acting, building, designing and the technical direction of a small studio production. Involvement may include acting or technical production.

THR 116 Introduction to Theatre (3 CR)
Survey of Western theatre and drama. Appreciation of theatre through understanding of historical development and societal function. Theatre architecture, production, costuming and acting styles, and the artists who create them.
Prerequisite: ENG 085*

THR 131 Stagecraft I (3 CR)
Basic theory of set design, including tools, equipment, terminology and construction.

THR 134 Stagecraft II (3 CR)
Continuation of Stagecraft I focusing on further developing techniques of stage scenery construction, rigging, scene painting and technical drafting. Process and methods of communicating design ideas through graphic representation are presented. **Prerequisite: THR 131**

THR 145 Fundamentals of Acting I (4 CR)
Fundamental theories and methodologies of acting and character development, using theatre games, improvisations and scene work with an emphasis on developing an ensemble.

THR 146 Fundamentals of Acting II (4 CR)
Advanced character work and an opportunity to rehearse and perform a studio theatre production.
Prerequisite: THR 145

THR 151 Make-Up for Stage & Video (3 CR)
Students learn the fundamental techniques of design and application of make-up for theatre and video

THR 201 Backstage Certification (1 CR)
Students receive training in manual and computerized light boards, sound systems, rigging and stage management and become certified on JCC equipment. Students crew a production at JCC.

THR 216 Voice for the Actor (3 CR)
This course will train the actor in the mechanics of vocal production, in the clarity, expressiveness and emotional context required for communicating the meaning of the spoken and written language and in dialects.

THR 241 Lighting for Stage & Video (3 CR)
Students learn the theoretical and practical aspects of lighting design for theatre, dance and video. Emphasis on design, execution and problem solving.

THR 242 Sound for Stage & Video (3 CR)
Students learn the theoretical and practical aspects of creating sound tracks for theatre and video. Topics include recording techniques, multi-track recording and mixing, editing, sound effects and sound reinforcement.

THR 260 Introduction to Directing (3 CR)
Fundamentals of play directing. Exploration of text analysis, staging techniques and rehearsal processes. Student-directed scenes analyzed and critiqued.
Prerequisite: THR 145 (can be taken concurrently)

VIDEO PRODUCTION (VID)

VID 101 Video Production I (3 CR)
A course designed to introduce students to the basics of video production in both field and studio environments. Through a combination of lectures, labs, field exercises and basic studio operations students learn the techniques, concepts, and processes involved in single camera production.

VID 120 Video Production II (3 CR)
This course is a continuation of Video Production I. Students focus on individual and group projects with the added elements of post-production, special effects and video distribution. Advanced lighting and sound editing with an emphasis on sound effects are covered. Techniques, concepts and processes involved in DVD authoring are also explored. **Prerequisite: VID 101**

WELDING TECHNOLOGY (WLD)

WLD 100 Fundamentals of Welding (4 CR)
Fundamentals of oxyacetylene and electric arc processes, history and applications. Includes study of gases, electricity, equipment and safety procedures. Provides laboratory experience welding in flat and horizontal positions.

WLD 110 MIG/TIG Welding (4 CR)
This is a welding course in GMAW (gas metal arc welding formally known as MIG welding) and GTAW (gas tungsten arc welding formally known as TIG welding) processes and techniques. Topics will include safety, use of equipment, power sources, shielding gases, filler metals, welding techniques, troubleshooting, weld defects and welding in the flat, vertical and horizontal positions.

You may meet this prerequisite based on your course placement, ACT score or successful college coursework. Visit our web site for current assessment options and requirements.

SPECIAL OPTIONS

Each discipline offers the following options. Contact the specific faculty for more information.

- **INDEPENDENT STUDY—VARIABLE CREDIT**
  In-depth study of topics in any discipline that is of special interest to the student. Topic is selected and detailed in consultation with a faculty member.

- **SPECIAL TOPICS —VARIABLE CREDIT**
  Intensive, in-depth investigation of one topic of current interest in any discipline. Different topics are chosen by the department.

- **WORK EXPERIENCE - INTERNSHIPS - SEMINARS VARIABLE CREDIT**
  Learn through meaningful work experience with an approved company in any discipline. The position must be obtained by the student and approved by the department before registration is permitted. Students apply the skills and knowledge gained from course work. A department faculty member supervises.