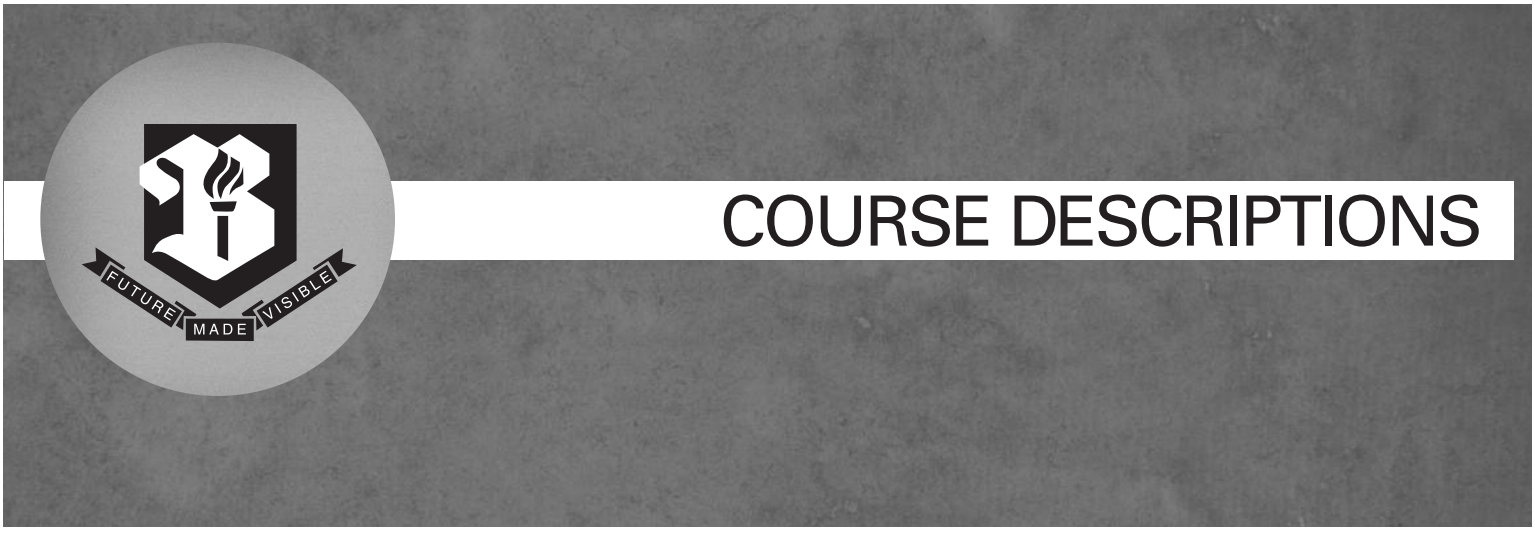


# COURSE DESCRIPTIONS

## COURSE DESCRIPTION ABBREVIATIONS

The following are the abbreviations used in this Catalog for the various disciplines:

| | |
|---|---|
| ACT | Accounting Technology |
| ACR | Air Conditioning/Refrigeration Technology |
| ANT | Anthropology |
| ART | Art |
| AST | Astronomy |
| ABR | Auto Body Repair Technology |
| ASE | Automotive Service Excellence |
| AUM | Automotive Technology |
| AUT | Automated Manufacturing Technology |
| BFN | Banking and Finance |
| BAR | Barbering |
| BSS | Basic Study Skills |
| BIO | Biology |
| BUS | Business |
| CHM | Chemistry |
| CHD | Child Development |
| CIS | Computer Science |
| CNC | Computerized Numerical Control |
| COS | Cosmetology |
| CIT | Cosmetology Instructor Training |
| CRJ | Criminal Justice |
| DEM | Diesel Mechanics |
| DDT | Drafting Design Engineering Technology |
| ECO | Economics |
| ELT | Electrical Technology |
| ELM | Electromechanical Technology |
| EMS | Emergency Medical Technology/Technician-Paramedic |
| EGR | Engineering |
| ENG | English |
| GEO | Geography |
| GLY | Geology |
| HED | Health Education |
| HIS | History |
| HEC | Home Economics |
| HUM | Humanities |
| ILT | Industrial Electronics Technician/Manufacturing Engineering |
| INT | Industrial Maintenance Technician |
| IDS | Interdisciplinary Studies |
| MCM | Mass Communications |
| MTT | Machine Tool Technology |
| MTH | Mathematics |
| MNT | Mining Technology |
| MUS | Music |
| MUL | Music Ensemble |
| MUP | Music Performance |
| NUR | Nursing (ADN) |
| NAS | Nursing (Nurse Assistant/Aide) |
| OAD | Business Office Management (Office Administration) |
| ORI | Orientation |
| PHL | Philosophy |
| PED | Physical Education |
| PHS | Physical Science |
| PHY | Physics |
| POL | Political Science |
| PSY | Psychology |
| RDG | Reading |
| REL | Religion |
| REN | Renewable Energy Technology |
| SOC | Sociology |
| SPA | Spanish |
| SPH | Speech |
| SUR | Surgical Operating Room Technician |
| THR | Theater Arts |
| TRK | Truck Driver Training |
| WDT | Welding |
| WKO | Workplace Skills |
| VTR | Vehicle Technology Repair |

## COURSE DESCRIPTIONS

Course descriptions include a course designation, course number, course title, and an indication of the number of lecture hours, lab hours, and semester hours of credit e.g., CHM 111, College Chemistry (3-3-4). (These numbers indicate that this course meets for the equivalent of 3 hours of lecture and 3 hours of lab each week and carries four semester hours of credit.) Courses that are required for individual programs are identified as CORE. Courses that are not creditable toward a degree are identified as NCA or NDC.

### ACCOUNTING TECHNOLOGY

ACT 141 BASIC ACCOUNTING PRINCIPLES (3-0-3)
This course provides a basic theory of accounting principles and practices used by service and merchandising enterprises. Emphasis is on financial accounting, including the accounting cycle, and financial statement preparation and analysis. Upon completion of this course, the student will be able to apply basic accounting principles and practices used by service and merchandising enterprises. CORE

ACT 246 MICROCOMPUTER ACCOUNTING (3-0-3)
PREREQUISITE: ACT 141 or BUS 241
This course utilizes the microcomputer in the study of financial accounting principles and practices. Emphasis is placed on the use of software programs for financial accounting applications. Upon completion of this course, the student will be able to use software programs for financial accounting applications. CORE

ACT 249 PAYROLL ACCOUNTING (3-0-3)
PREREQUISITE: ACT 141 OR BUS 241
This course focuses on federal, state, and local laws affecting payrolls. Emphasis is on payroll accounting procedures and practices, and on payroll tax reports. Upon completion of this course, the student will be able to apply knowledge of federal, state, and local laws affecting payrolls.

ACT 253 INDIVIDUAL INCOME TAX (3-0-3)
This course focuses on the fundamentals of the federal income tax laws with primary emphasis on those affecting the individual. Emphasis is on gross income determination, adjustments to income, business expenses, itemized deductions, exemptions, capital gains/losses, depreciation and tax credits. Upon completion of this course the student will be able to apply the fundamentals of the federal income tax laws affecting the individual.

### AIR CONDITIONING/REFRIGERATION TECHNOLOGY

ACR 111 PRINCIPLES OF REFRIGERATION (1-4-3)
This course emphasizes the fundamental principles for air conditioning and refrigeration. Instruction is provided in the theory and principles of refrigeration and heat transfer, HVAC/R system components, common, and specialty tools for HVAC/R, and application of the concepts of basic compression refrigeration. Upon completion, students should identify system components and understand their functions, identify and use common and specialty HVAC/R tools, and maintain components of a basic compression refrigeration system. CORE

ACR 112 HVAC/R SERVICE PROCEDURES (1-4-3)
This course covers system performance checks and refrigerant cycle diagnosis. Emphasis is placed on the use of refrigerant recovery/recycle units, industry codes, refrigerant coils and correct methods of charging and recovering refrigerants. Upon completion, students should be able to properly recover/recycle refrigerants and demonstrate safe, correct service procedures which comply with the no-venting laws.

ACR 113 REFRIGERATION PIPING PRACTICES (1-4-3)
This course introduces students to the proper installation procedures of refrigerant piping and tubing for the heating, ventilation, air conditioning and refrigeration industry. This course includes various methods of working with and joining tubing. Upon completion, students should comprehend related terminology and be able to fabricate pipe, tubing, and pipe fittings. CORE

ACR 119 FUNDAMENTALS OF GAS HEATING SYSTEMS (1-4-3)
This course provides instruction on general service and installation for common gas furnace system components. Upon completion, students will be able to install and service gas furnaces in a wide range of applications.

ACR 120 FUNDAMENTALS OF ELECTRIC HEATING SYSTEMS (1-4-3)
This course covers the fundamentals of electric furnace systems. Emphasis is placed on components, general service procedures and basic installation. Upon completion, students should be able to install and service electric furnaces, heat pumps and solar and hydronics systems.

ACR 121 PRINCIPLES OF ELECTRICITY FOR HVAC/R (1-4-3)
This course is designed to provide the student with the basic knowledge of electrical theory and circuitry as it pertains to air conditioning and refrigeration. This course emphasizes safety, definitions, symbols, laws, circuits, and electrical test instruments. Upon completion, students should understand and be able to apply the basic principles of HVAC/R circuits and circuit components. CORE

ACR 122 HVAC/R ELECTRICAL CIRCUITS (1-4-3)
This course introduces the student to electrical circuits and diagrams. Electrical symbols and basic wiring diagrams are constructed in this course. Upon completion, students should understand standard wiring diagrams and symbols and be able to construct various types of electrical circuits. CORE

ACR 123 HVAC/R ELECTRICAL COMPONENTS (1-4-3)
This course introduces students to electrical components and controls. Emphasis is placed on the operations on motors, relays, contactors, starters, and other HVAC electrical components. Upon completion, students should be able to install electrical components and determine their proper operation. CORE

ACR 126 COMMERCIAL HEATING SYSTEMS (1-4-3)
This course covers the theory and application of larger heating systems. Emphasis is placed on larger heating systems associated with commercial applications such as gas heaters, boilers, unit heaters and duct heaters. Upon completion, students should be able to troubleshoot and perform general maintenance on commercial heating systems.

ACR 127 HVAC/R ELECTRIC MOTORS (1-4-3)
This course covers the basic maintenance of electric motors used in HVAC/R systems. Topics include types of motors, motor operations, motor installation and troubleshooting motors. Upon completion, students should be able to install and service HVAC/R electric motors.

ACR 128 HEAT LOAD CALCULATIONS (3-0-3)
This course focuses on heat flow into and out of building structures. Emphasis is placed on determining heat gain/heat loss of a given structure. Upon completion, students should be able to calculate heat load and determine HVAC equipment size requirements.

ACR 132 RESIDENTIAL AIR CONDITIONING (1-4-3)
This course introduces students to residential air conditioning systems. Emphasis is placed on the operation, service, and repair of residential air conditioning systems. Upon completion, students should be able to service and repair residential air conditioning systems.

ACR 133 DOMESTIC REFRIGERATION (1-4-3)
This course covers domestic refrigerators and freezers. Emphasis is placed on installation, removal, and maintenance of components. Upon completion, students should be able to service and adjust domestic refrigeration units.

ACR 134 ICE MACHINES (1-4-3)
This course introduces students to commercial ice machines. Emphasis is placed on components, electrical and mechanical operation sequences, control adjustment procedures, preventive maintenance, repairs, and installation procedures. Upon completion, student should be able to install, service and repair commercial ice machines.

ACR 135 MECHANICAL/GAS/SAFETY CODES (3-0-3)
This course is to enhance the student knowledge of the International Fuel Gas Code and International Mechanical Code as well as fire and job safety requirements. Emphasis is placed on code book content and compliance with installation requirements. Upon completion, students should be able to apply code requirements to all work.

ACR 144 BASIC DRAWING AND BLUEPRINT READING IN HVAC (3-0-3)
This course covers basic drawing and blueprint reading as applied to the HVAC industry. Emphasis is on three-view drawings, basic duct systems, and isometric piping. Upon course completion, students should be able to perform basic drawings related to HVAC systems and read pertinent blueprints.
ACR 147 REFRIGERATION TRANSITION & RECOVERY THEORY (3-0-3)
This course is EPA-approved and covers material relating to the requirements necessary for type I, II, and III universal certifications. Upon completion, students should be prepared to take the EPA 608 certification examination.

ACR 148 HEAT PUMPS SYSTEMS I (1-4-3)
Instruction received in this course centers around the basic theory and application of heat pump systems and components. Upon completion, students will be able to install and service heat pumps in a wide variety of applications.

ACR 200 REVIEW FOR CONTRACTORS EXAM (3-0-3)
This course prepares students to take the State Certification Examination. Emphasis is placed on all pertinent codes, piping procedures, duct design, load calculation, psychometrics, installation procedures, and air distribution. Upon completion, students should be prepared to take the contractors exam.

ACR 203 COMMERCIAL REFRIGERATION (1-4-3)
This course focuses on commercial refrigeration systems. Emphasis is placed on evaporators, condensers, compressors, expansion devices, special refrigeration components and application of refrigeration systems. Upon completion students should be able to service and repair commercial refrigeration systems.

ACR 209 COMMERCIAL AIR CONDITIONING SYSTEMS (1-4-3)
This course focuses on servicing and maintaining commercial and residential HVAC/R systems. Topics include system component installation and removal and service techniques. Upon completion, the student should be able to troubleshoot and perform general maintenance on commercial and residential HVAC/R systems.

ACR 210 TROUBLESHOOTING HVAC/R SYSTEMS (1-4-3)
This course provides instruction in the use of various meters and gauges used in the HVAC/R industry. Emphasis is placed on general service procedures, system diagnosis, and corrective measure, methods of leak detection, and system evacuation, charging and performance checks. Upon completion, students should be able to perform basic troubleshooting of HVAC/R systems.

## ANTHROPOLOGY

ANT 200 INTRODUCTION TO ANTHROPOLOGY (3-0-3)
This course is a survey of physical, social, and cultural development and behavior of human beings. CORE

ANT 210 PHYSICAL ANTHROPOLOGY (3-0-3)
This course is a study of the human evolution based upon fossil and archaeological records as well as analysis of the variation and distribution of contemporary human populations. CORE

ANT 220 CULTURAL ANTHROPOLOGY (3-0-3)
PREREQUISITE: ANT 200
This course is the application of the concept of culture to study of both primitive and modern society. CORE

ANT 230 INTRODUCTION TO ARCHEOLOGY(3-0-3)
This course is an introduction to archeological excavation techniques and post excavation laboratory procedures. CORE

## ART

ART 100 ART APPRECIATION (3-0-3)
This course is designed to help the student find personal meaning in works of art and develop a better understanding of the nature and validity of art. Emphasis is on the diversity of form and content in original art work. Upon completion, students should understand the fundamentals of art, the materials used and have a basic overview of the history of art. CORE

ART 103 INTRODUCTION TO ART I (0-6-3)
This course is designed as an introduction to the basic fundamentals of art. Emphasis is placed on personal expression and an understanding of the various art media. Upon completion, students should be able to express creative ideas visually and become more aware of media and how it effects communication.

ART 104 INTRODUCTION TO ART II (0-6-3)
PREREQUISITE: ART 103
This course provides the opportunity for students to work with media problems beyond Introduction to Art I. Emphasis is placed on personal expression and an understanding of various art materials and techniques. Upon completion, students should improve their ability to express creative ideas visually.

ART 113 DRAWING I (0-6-3)
This course provides the opportunity to develop perceptional and technical skills in a variety of media. Emphasis is placed on communication through experimenting with composition, subject matter and technique. Upon completion, students should demonstrate and apply the fundamentals of art to various creative drawing projects.

ART 114 DRAWING II (0-6-3)
PREREQUISITE: ART 113
This course advances the students' drawing skills in various art media. Emphasis is placed on communication through experimentation, composition, technique and personal expression. Upon completion, students should demonstrate creative drawing skills, the application of the fundamentals of art, and the communication of personal thoughts and feelings.

ART 133 CERAMICS I (0-6-3)
This course introduces methods of clay forming as a means of expression. Topics may include hand building, wheel throwing, glazing, construction, design, and the functional and aesthetic aspects of pottery. Upon completion, students should demonstrate through their work, a knowledge of the methods, as well as an understanding of the craftsmanship and aesthetics involved in ceramics.

ART 134 CERAMICS II (0-6-3)
PREREQUISITE: ART 133
This course develops the methods of clay forming as a means of expression. Topics may include hand building, glazing, design and the functional and aesthetic aspects of pottery, although emphasis will be placed on the wheel throwing method. Upon completion, students should demonstrate improved craftsmanship and aesthetic quality in the production of pottery.

ART 173 PHOTOGRAPHY I (0-6-3)
This course is an introduction to the art of photography. Emphasis is placed on the technical and aesthetic aspects of photography with detailed instruction in darkroom techniques. Upon completion, students should understand the camera as a creative tool, understand the films, chemicals and papers, and have a knowledge of composition and history.

ART 174 PHOTOGRAPHY II (0-6-3)
PREREQUISITE: ART 173
This course advances the students' technical and aesthetic knowledge of photography beyond the introductory level. Emphasis is placed on photographic composition and darkroom techniques as a means of communication. Upon completion, students should demonstrate through the photographic process his/her creative and communication skills.

ART 203 ART HISTORY I (3-0-3)
This course covers the chronological development of different forms of art, such as sculpture, painting, and architecture. Emphasis is placed on history from the ancient period through the Renaissance. Upon completion, students should be able to communicate a knowledge of time period and chronological sequence including a knowledge of themes, styles and of the impact of society on the arts. CORE

ART 204 ART HISTORY II (3-0-3)
This course covers a study of the chronological development of different forms of art, such as sculpture, painting and architecture. Emphasis is placed on history from the Baroque to the present. Upon completion, students should be able to communicate a knowledge of time period and chronological sequence including a knowledge of themes, styles and of the impact of society on the arts. CORE

ART 231 WATERCOLOR PAINTING I (0-6-3)
PREREQUISITE: ART 113 or advisor approval.
This course introduces materials and techniques appropriate to painting on paper with water-based medium. Emphasis is placed on developing the technical skills and the expressive qualities of watercolor painting. Upon completion, students should be able to demonstrate a basic proficiency in handling the techniques of watercolor and how it can be used for personal expression.

ART 232 WATERCOLOR II (0-6-3)
PREREQUISITE: ART 231
This course advances the skills and techniques of painting on paper using water based medium. Emphasis is placed on exploring the creative uses of watercolor and developing professional skills. Upon completion, students should demonstrate and compile a body of original paintings that reflect a personal awareness of the media's potential.

ART 233 PAINTING I (0-6-3)
PREREQUISITE: ART 113 or advisor approval.
This course is designed to introduce the student to fundamental painting processes and materials. Topics include art fundamentals, color theory, and composition. Upon completion, students should be able to demonstrate the fundamentals of art and discuss various approaches to the media and the creative processes associated with painting.

ART 234 PAINTING II (0-6-3)
PREREQUISITE: ART 233
This course is designed to develop the student's knowledge of the materials and procedures of painting beyond the introductory level. Emphasis is placed on the creative and technical problems associated with communicating through composition and style. Upon completion, students should be able to demonstrate the application of the fundamentals of painting and the creative process to the communication of ideas.

ART 291 SUPERVISED STUDY IN STUDIO ART I (0-2–8–1-4)
PREREQUISITE: Advisor approval.
This course is designed to enable the student to continue studio experiences in greater depth. Topics are to be chosen by the student with the approval of the advisor. Upon completion, the student should have a greater expertise in a particular area of art.

## ASTRONOMY

AST 200 OBSERVATIONAL ASTRONOMY (0-4-2)
This is a laboratory course which introduces the student to the techniques of astronomical observation. Evening laboratory work will be required.

AST 220 INTRODUCTION TO ASTRONOMY (3-2-4)
This course covers the history of astronomy and the development of astronomical thought leading to the birth of modern astronomy and its most recent development. Emphasis is placed on the coverage of astronomical instruments and measuring technologies, the solar system, the Milky Way galaxy, important extra galactic objects and cosmology. Laboratory is required. CORE

## AUTO BODY REPAIR TECHNOLOGY

ABR 111 NON-STRUCTURAL REPAIR (1-4-3)
Students are introduced to basic principles of non-structural panel repairs. Topics include shop safety, identification and use of hand/power tools, panel preparation, sheet metal repairs, and materials. CORE

ABR 114 NON-STRUCTURAL PANEL REPLACEMENT (1-4-3)
Students are introduced to the principles of non-structural panel replacement. Topics include replacement and alignment of bolt on panels, full and partial panel replacement procedures, and attachment methods. CORE

ABR 122 SURFACE PREPARATION (1-4-3)
This course introduces students to methods of surface preparation for vehicular refinishing. Topics include sanding techniques, metal treatment, selection of undercoats, and proper masking procedures. CORE

ABR 123 PAINT APPLICATION & EQUIPMENT (1-4-3)
This course introduces students to methods of paint application and equipment used for vehicular refinishing. Topics include spray gun and related equipment use, paint mixing, matching, and applying the final topcoat. CORE

ABR 151 SAFETY & ENVIRONMENTAL PRACTICES (1-4-3)
This course is designed to instruct the student in the safe use of tools, equipment, and appropriate work practices. Topics include OSHA requirements, the right-to-know laws, EPA regulations as well as state and local laws. CORE

ABR 154 AUTOMOTIVE GLASS & TRIM (1-4-3)
This course is a study of automotive glass and trim. Emphasis is placed on removal and replacement of structural and nonstructural glass and automotive trim. Upon completion, students should be able to remove and replace automotive trim and glass. CORE

ABR 156 AUTOMOTIVE CUTTING & WELDING (1-4-3)
Students are introduced to the various automotive cutting and welding processes. Emphasis is placed on safety, plasma arc, oxy-acetylene cutting, resistance type spot welding, and Metal Inert Gas (MIG) welding. Upon completion, students should be able to safely perform automotive cutting and welding procedures. CORE

ABR 157 AUTOMOTIVE PLASTIC REPAIRS (1-4-3)
This course provides instruction in automotive plastic repairs. Topics include plastic welding (airless, hot and chemical), use of flexible repair fillers, identification of types of plastics, and determining the correct repair procedures for each. Upon completion, students should be able to correctly identify and repair the different types of automotive plastics.

ABR 213 AUTOMOTIVE STRUCTURAL ANALYSIS (1-4-3)
Students learn methods of determining structural misalignment. Topics include methods of inspection, types of measuring equipment, data sheets, and identifying types of structural damage. CORE

ABR 214 AUTOMOTIVE STRUCTURAL REPAIR (1-4-3)
This course provides instruction in the correction of structural damage. Topics include types and use of alignment equipment, anchoring and pulling methods, and repair/replacement of structural components. CORE

ABR 265 PAINT DEFECTS & FINAL DETAIL (1-4-3)
This course introduces students to methods of identifying paint defects, causes, cures, and final detailing. Students learn to troubleshoot and correct paint imperfections. CORE

ABR 267 SHOP MANAGEMENT (1-4-3)
This course introduces the students to the basic principles of body shop management. Emphasis is placed on management structure, customer/insurance company relations, sound business practices, principles of cycle time, and basic collision/damage estimation. Upon completion, students should be able to understand the principles of operating a collision repair facility.

ABR 281 SPECIAL TOPICS IN AUTO BODY (3-0-3)
This course is guided independent study in special projects to give the student additional training in a specific area selected by the instructor. Emphasis is placed on individual student needs to improve or expand skills. Upon course completion, students should be able to demonstrate skills to meet specific needs.

## AUTOMATED MANUFACTURING TECHNOLOGY

AUT 102 MANUFACTURING FUNDAMENTALS (3-0-3)
This course will introduce students to manufacturing fundamentals. it introduces various tools and techniques typically used in Lean manufacturing. It also will provide Occupational Safety and Health Administration (OSHA) certification instruction. OSHA standards will include electrical, Lock Out/Tag Out, hazardous communications, personal protective equipment, machine guarding, and walking and working surfaces. CORE

AUT 104 BLUEPRINT READING FOR MANUFACTURING (3-0-3)
This course provides the students with terms and definitions, theory of orthographic projection, and other information required to interpret drawings used in the manufacturing and industrial trade areas. Topics include multi-view projection, pictorial drawings, dimensions and notes, lines and symbols, tolerances, industrial applications, scales and quality requirements. Upon completion, students should be able to interpret blueprint drawings used in the manufacturing and industrial trades. This course may be tailored to meet specific local industry needs. CORE

AUT 116 INTRODUCTION TO ROBOTICS (1-4-3)
This course provides instruction in concepts and theories for the operation of robotic servomotors and power systems used with industrial robotic equipment. Emphasis is on the application of the computer to control power systems to perform work. Student competencies include understanding of the functions of hydraulic, pneumatic, and electrical power system components, ability to read and interpret circuitry for proper trouble shooting and ability to perform preventative maintenance. CORE

AUT 117 AC/DC MACHINES (1-4-3)
This course covers the theory and operation of DC motors single and three phase AC motors and the labs will reinforce this knowledge. Emphasis is placed on the various types of single and three phase motors, writing diagrams, starting devices, and practical application in the lab. This course is also taught as ELT 117.

AUT 131 FLUID POWER (1-4-3)
This course offers an intermediate progression into fluid power systems. Topics include hydraulic and pneumatic power, pressure, flow, speed and pressure control, relief valves, and directional control valve (DCV) applications. Upon completion of this course the student will have demonstrated the ability to read gauges, design, draw, and connect hydraulic and pneumatic circuits, measure and calculate circuit parameters, connect and operate DCV's and relief valves.

AUT 150 INTRODUCTION TO MACHINE SHOP I (2-2-3)
This course introduces machining operations as they relate to the metalworking industry. Topics include machine shop safety, measuring tools, lathes, saws, milling machines, bench grinders, and layout instruments. Upon completion, students will be able to perform the basic operations of measuring, layout, drilling, sawing, turning, and milling. This course is also taught as MTT 147.

## AUTOMOTIVE SERVICE EXCELLENCE/ AUTOMOTIVE TECHNICIAN

ASE/AUM 101 FUNDAMENTALS OF AUTOMOTIVE TECHNOLOGY (1-4-3)
This course provides basic instruction in Fundamentals of Automotive Technology. This is a CORE course and supports CIP code 15.0803 and 47.0604.

ASE/AUM 124 AUTOMOTIVE ENGINES (1-4-3)
This course provides instruction on the operation, design, and superficial repair of automotive engines. Emphasis is placed on understanding the four stroke cycle, intake and exhaust manifolds and related parts, engine mechanical timing components, engine cooling and lubrication system principles and repairs, and basic fuel and ignition operation. This is a CORE course and supports CIP code 47.0604 and 15.0803.

ASE/AUM 130 DRIVE TRAIN & AXLES (1-4-3)
This course provides basic instruction in automotive drive trains and axles. Emphasis is placed on the understanding and application of basic internal and external operation relating to proper operation and driveability. ABR 223 Automotive Mechanical Components is a suitable substitute for this course. This is a CORE course.

ASE/AUM 162 ELECTRICAL AND ELECTRONIC SYSTEMS (1-4-3)
This is an intermediate course in automotive electrical and electronic systems. Emphasis is placed on troubleshooting and repair of battery, starting, charging, and lighting systems, subsystems, and components. This is a CORE course.

ASE/AUM 212 ADVANCED ELECTRICAL & ELECTRONIC SYSTEMS (1-4-3)
This course provides instruction in advanced automotive electrical and electronic systems. Emphasis is placed on troubleshooting and repair of advanced electrical and electronic systems, subsystems, and components.

ASE/AUM 220 ADVANCED AUTOMOTIVE ENGINES (1-4-3)
This course provides in depth instruction concerning internal engine diagnosis, overhaul and repair, including but not necessarily limited to the replacement of timing chains, belts, and gears, as well as the replacement or reconditioning of valve train components as well as replacement of pistons, connecting rods, piston rings, bearings, lubrication system components, gaskets, and oil seals. This course supports CIP code 47.0604 and 15.0803.

ASE/AUM 224 MANUAL TRANSMISSION & TRANSAXLE (1-4-3)
This course covers basic instruction in manual transmissions and transaxles. Emphasis is placed on the understanding and application of basic internal and external operation relating to proper operation and driveability. This course supports CIP codes 15.0803 and 47.0604.

ASE/AUM 230 AUTO TRANSMISSION & TRANSAXLE (1-4-3)
This course provides basic instruction in automatic transmissions and transaxles. Emphasis is placed on the comprehension of principles and powerflow of automatic transmissions and repairing or replacing internal and external components. This is a CORE course supports CIP Code 15.0803 and 47.0604.

ASE/AUM 239 ENGINE PERFORMANCE (1-4-3)
This course provides basic instruction in engine performance with emphasis on fuel and ignition systems relating to engine operation. This is a CORE course and supports CIP code 15.0803 and 47.0604.

ASE/AUM 244 ENGINE PERFORMANCE AND DIAGNOSTICS (1-4-3)
This course provides advanced instruction in engine performance. Emphasis is placed on engine management and computer controls of ignition, fuel, and emissions systems relating to engine performance and driveability. This is a CORE course and supports CIP Code 15.0803 and 47.0604.

ASE/AUM 246 AUTOMOTIVE EMISSIONS (1-4-3)
This is an introductory course in automotive emission systems. Emphasis is placed on troubleshooting and repair of systems, subsystems, and components. This course supports CIP code 15.0803 and 47.0604.

ASE/AUM 281 SPECIAL TOPICS (0-6-3)
These courses are designed to allow the student to specialize in a particular area of study with minimum instruction in automotive mechanics application and with evaluation at the instructor's discretion. Emphasis is placed on a topic/project that the student is interested in and may include any automotive or related area in automotive mechanics. Upon completion, the student should be able to work with minimum instruction and execute the necessary techniques to finish a live work project of their choice.

## BANKING AND FINANCE

BFN 100 PRINCIPLES OF BANKING (2-0-2)
This course is an introduction to the broad area of banking. Topics include the evolution of banking, Federal Reserve System, documents and forms used, rudimentary laws and regulations, as well as a study of the specialized services offered. Upon completion of this course, the student will be able to perform basic banking functions. CORE

BFN 101 LAW AND BANKING PRINCIPLES (2-0-2)
This course is an introduction to banking law and legal issues, with special emphasis on the Uniform Commercial Code. Topics include the role of regulators, torts, contracts, real estate bankruptcy, and the legal implications of consumer lending. Upon completion of this course, the student will be able to work with basic banking documents. CORE

BFN 102 LAW AND BANKING APPLICATIONS (2-0-2)
This course is an introduction to laws pertaining to secured transactions, letters of credit, the bank collection process, check losses and the legal issues related to processing checks. Topics include negotiable instruments, authorized signatures, collection routes, forgery and fraud, letters of credit and secured transactions. Upon completion of this course, the student will be able to work with more complex banking documents. CORE

BFN 110 MARKETING FOR BANKERS (2-0-2)
This course is an introduction to basic marketing principals and how a bank develops a successful marketing plan. Topics include consumer behavior, market research, the planning process, public relations, advertising, and sales promotion. Upon completion of this course, the student will have the skills to bring in new business. CORE

BFN 128 ACCOUNTING (3-0-3)
This course emphasizes current practices of accounting procedures and includes coverage of the latest principles set forth by the Financial Accounting Standards Board.

BFN 136 COMMERCIAL LENDING (2-0-2)
This course is an introduction to the commercial lending process and how it contributes to bank profitability. Topics include a history of commercial lending, skills needed to become a successful loan officer, steps in the commercial loan process and trends impacting the commercial lending process.

BFN 147 CONSUMER LENDING (2-0-2)
PREREQUISITE: As required by program.
This course provides an introduction to the consumer credit function. Topics include a history of the consumer credit function, products and services, the consumer lending process, and credit administration. Upon completion of this course, the student will be able to work in the areas of consumer lending.

BFN 167 SUPERVISION (2-0-2)
This course is designed to help new or potential supervisors to become better managers. Topics include leadership, delegation, motivation, communication, the planning function, staffing, directing, and controlling. Upon completion of this course, the student will have the required skills to be a better manager.

BFN 205 MONEY AND BANKING (3-0-3)
This course provides an introduction to the money supply and the role banks play in relation to money creation. Topics include financial intermediaries, the Federal Reserve, monetary policy, fiscal policy, and international banking. Upon completion of this course, the student will have the necessary skills to work in a variety of different departments within the bank. CORE

BFN 217 VERBAL COMMUNICATION FOR BANKERS (1-0-1)
This course is an introduction to good verbal communication. Topics include the communication process, enunciation, effective listening, meetings and being able to present oneself with an impact.

BFN 218 WRITTEN COMMUNICATION FOR BANKERS (1-0-1)
This course is an introduction to the written communication principles necessary for success in a competitive market. Topics include objective(s), personality, grammar, writing for the reader, persuasion and form.

BFN 236 ANALYZING FINANCIAL STATEMENTS (2-0-2)
This course provides an introduction of how financial data are generated and their limitations. Topics include techniques for analyzing the flow of business' funds, methods for selecting and interpreting financial ratios and analytical tools for predicting and testing assumptions about a firm's future performance.

BFN 260 ECONOMICS FOR BANKERS (3-0-3)
This course is an introduction to the fundamental principles of economics as they apply to banking. Topics include economic indicators, economic theory, economic systems, and inflation. Upon completion of this course, the student will have the skills to conduct a cost/benefit analysis and to spot influential economic trends.

## BARBERING

BAR 108 INTRODUCTION TO BARBERING (3-0-3)
Co-requisite: BAR 111 Introduction to Barbering Lab
This course provides an orientation to professional barber styling. Topics include learning skills, history of barbering, professional image, microbilogy, saftey infection control, implements and tools, razor shaving properties and disorders of hair and scalp, and the treatment of hair. CORE

BAR 111 INTRODUCTION TO BARBERING LAB (0-9-3)
Co-requisite: BAR 108 Introduction to Barbering
This course provides practical application of baber-styling fundamentals. Emphasis is placed on safety, infection control, the use and care of implements, treatment of hiar, and razor shaving. Upon completion, the student will demonstrate proper infection control, hair care, and use of implements. CORE

BAR 112 SCIENCE OF BARBERING (3-0-3)
Co-requisite: BAR 113 Fundamentals of Barbering Applications
This course introduces the student to the basic science of barber-styling. Topics include anatomy/physiology, disorders and treatments of the skin,

scalp, and hair, the theory of facial and scalp massage. Upon completion, the student should be familiar with the anatomical structures, as well as disorders and treatments of the skin, scalp, and hair. CORE

BAR 113 FUNDAMENTALS OF BARBERING APPLICATIONS (0-9-3)
Co-requisite: BAR 112 Science of Barbering
This course provides practical application of barber fundamentals learned in earlier courses. Emphasis is placed on safety, facial massage, treatment of hair and scalp, proper use and care of implements, shampooing and haircutting, and razor shaving. Upon completion, the student should be able to perform fundamental barbering techniques with limited supervision. CORE

BAR 114 BARBER-STYLING LAB (0-9-3)
This course provides students with the opportunity to demonstrate skills in hair care, hair cutting, and facial massage. Emphasis is placed on safety and infection control.

BAR 115 CUTTING AND STYLING TECHNIQUES (0-9-3)
This course provides practical experience in basic sissor and clipper haircutting. Upon completion, the student will be able to cut and style a client's hair, demonstrating correct scissor and clipper cutting and styling techniques.

BAR 120 PROPERTIES OF CHEMISTRY (3-0-3)
This course provides the student with a basic knowledge of chemicals used in barber-styling. Topics include the changes produced in the hair and skin through exposure to chemicals, electricity, and special light spectrums. Upon completion, the student should understand the proper use of implements and chemicals to treat hair and skin. NDC, CORE

BAR 121 CHEMICAL HAIR PROCESSING (0-9-3)
This course provides students with opportunties to apply the use of chemicals to alter the appearance of hair. Emphasis is placed on the use of chemicals to relax, wave, and soft curl and hair. Upon completion, students will be competent in the use of chemicals to produce desired structure changes to the hair. NDC

BAR 122 HAIR COLORING CHEMISTRY (3-0-3)
This course provides the student with a basic knowledge of hair color alteration. Topics include temporary, semi-permanent, and permanent changes. Upon completion, the student should be able to identify and explain the procedures for each classification of hair color alteration. NDC

BAR 124 HAIR COLORING METHODOLOGY LAB (0-9-3)
This course provides the student an opportunity for practical application of all classifications of chemical hair coloring and processing products in a supervised environment. Emphasis is placed on experience in all classifications of hair coloring and processing procedures. NDC

BAR 130 MARKETING AND BUSINESS MANAGEMENT (3-0-3)
This course provides the student with marketing and management skills that are essential for successful salon management. Topics include first aid, job search, bookkeeping, selling techniques, shop floor plans, shop location, and legal regulations. Upon completion, the student should be aware of marketing and business management requirements for a successful salon. NDC

BAR 132 STYLING AND DESIGN (3-0-3)
This course introduces the student to the art of hair style and design. Topics include the selection of styles to create a mood or compliment facial features as well as hair replacement and hair pieces. Upon completion, the student should know the principals of style and design.

BAR 133 STYLING AND MANAGEMENT (0-9-3)
This course includes hair styling and management procedure. Emphasis is placed on styling, management, marketing, and legal regulations. Upon completion, the student should be able to integrate a variety of skills and be ready to begin an internship in a salon setting.

BAR 140 PRACTICUM (0-10-2)
This course provides the student an opportunity to combine knowledge and skill covering all aspects of barber-styling in a professional setting or school lab iwth minimal supervision. Emphasis is placed on utilization of the knowledge and technical skills covered in the barbering-styling curriculum. Upon completion the student should be able to function in a professional setting with very little assistance.

BAR 141 PRACTICUM (0-10-2)
This course provides the student an additional opportunity to combine knowledge and skill covering all aspects of barber-styling in a professional setting or school lab with minimal supervision. Emphasis is placed on utilization of the knowledge and technical skills covered in the barbering-styling curriculum. Upon completion the student should function in a professional setting as a productive employee or manager.

BAR 143 STATE BOARD REVIEW (1-6-3)
Students are provided a complete review of all written and practical procedures in barbering and state board requirements. Upon completion students should be able to demonstrate the practical skills necessary to meet the requirements of state board certification and employment.

BAR 181 SPECIAL TOPICS IN BARBERING (1-0-1)
This course provides specialized instruction in various areas related to the barbering profession. Student learning outcomes are developed to support specific student needs.

BAR 183 SPECIAL TOPICS IN BARBERING (0-6-2)
This course provides specialized instruction in various areas related to the barbering profession. Student learning outcomes are developed to support specific student needs.

BAR 185 SPECIAL TOPICS IN BARBERING (3-0-3)
This course provides specialized instruction in various areas related to the barbering profession. Student learning outcomes are developed to support specific student needs.

BAR 187 SPECIAL TOPICS IN BARBERING (0-9-3)
This course provides specialized instruction in various areas related to the barbering profession. Student learning outcomes are developed to support specific student needs.

## BASIC STUDY SKILLS

BSS 090 BASIC STUDY SKILLS (1-3–0–1-3)
This course is designed to introduce students to the basic skills of "how to study". The course includes activities such as an assessment through testing of academic/study strengths and weaknesses, general information about effective study techniques, and applications of study techniques for specific courses. May be repeated for credit. NDC

BSS 100 CAREER PLANNING AND PERSONAL DEVELOPMENT (1-3–0–1-3)
This courses is designed to provide an awareness of and preparation for the world of work. It provides direction in career planning by evaluating individual interest, values, skills, and personality needs to set career goals and establish strategies to achieve those goals.

BSS 101 INTERMEDIATE STUDY SKILLS (Nursing students only) (3-0-3)
PREREQUISITE: Eligibility for ENG 101 and MTH 116
This course is designed for nursing students and offers a variety of effective study techniques. The course includes an assessment of study strengths and weaknesses and specific techniques for an overall system of successful study in nursing courses. BSS 101 is required of all nursing students seeking readmission into the program.

## BIOLOGY

BIO 103 PRINCIPLES OF BIOLOGY I (3-2-4)
PREREQUISITE: Regular admission status
This is an introductory course for science and non-science majors. It covers physical, chemical, and biological principles common to all organisms. These principles are explained through a study of cell structure and function, cellular reproduction, basic biochemistry, cell energetics, the process of photosynthesis, and Mendelian and molecular genetics. Also included are the scientific method, basic principles of evolution, and an overview of the diversity of life with emphasis on viruses, prokaryotes, and protists. Lab is required. CORE

BIO 104 PRINCIPLES OF BIOLOGY II (3-3-4)
PREREQUISITE: BIO 103
This course is an introduction to the basic ecological and evolutionary relationships of plants and animals and a survey of plant and animal diversity

including classification, morphology, physiology, and reproduction. Lab is required. CORE

BIO 201 HUMAN A & P I (3-2-4)
PREREQUISITE: BIO 103
Human Anatomy and Physiology I covers the structure and function of the human body. Included is an orientation of the human body, basic principles of chemistry, a study of cells and tissues, metabolism, joints, the integumentary, skeletal, muscular, and nervous systems, and the senses. Dissection, histological studies, and physiology are featured in the laboratory experience. Lab is required.

BIO 202 HUMAN A & P II (3-2-4)
PREREQUISITE: BIO 103 & BIO 201
Human Anatomy and Physiology II covers the structure and function of the human body. Included is a study of basic nutrition, basic principles of water, electrolyte, and acid-base balance, the endocrine, respiratory, digestive, excretory, cardiovascular, lymphatic, and reproductive systems. Dissection, histological studies, and physiology are featured in the laboratory experience. Lab is required.

BIO 220 GENERAL MICROBIOLOGY (2-4-4)
PREREQUISITE: BIO 103
(RECOMMENDED 4 SEMESTER HOURS OF CHEMISTRY).
This course includes historical perspectives, cell structure and function, microbial genetics, infectious diseases, immunology, distribution, physiology, culture, identification, classification, and disease control of microorganisms. The laboratory experience includes micro-techniques, distribution, culture, identification, and control. Lab is required.

BIO 230 HUMAN PATHOPHYSIOLOGY (3-2-4)
PREREQUISITE: BIO 201, BIO 202 AND BIO 220.
Human Pathophysiology covers the nature, etiology, prognosis, prevention, and therapeutics of human disease. Lab is required.

**BUSINESS**

BUS 105/MKT 223 CUSTOMER SERVICE (3-0-3)
This course presents the foundations required for developing skills and knowledge to work effectively with internal and external customers. The students will gain an understanding of the skills, attitudes, and thinking patterns needed to win customer satisfaction and loyalty.

BUS 146 PERSONAL FINANCE (3-0-3)
This course is a survey of topics of interest to the consumer. Topics include budgeting, financial institutions, basic income tax, credit, consumer protection, insurance, house purchase, retirement planning, estate planning, investing, and consumer purchases.

BUS 175 RETAILING (3-0-3)
This course is a study of the principles and practices of retailing. Topics include planning, policies and procedures of distribution, store design, layout and location, the economic and social role of retailing, competitive strategies, and retail management.

BUS 177 SALESMANSHIP (3-0-3)
This course provides an introduction to the principles and practices of ethical salesmanship. Topics include industrial and retail selling methods of market analysis, professional salesmanship and sales methods, consumer types, attitudes, and behavior.

BUS 215 BUSINESS COMMUNICATION (3-0-3)
PREREQUISITE: OAD 101, 103, 104, 125 or CIS 146.
This course covers written, oral and nonverbal communications. Topics include the application of communication principles to the production of clear, correct, and logically organized faxes, e-mail, memos, letters, resumes, reports, and other business communications.

BUS 241 PRINCIPLES OF ACCOUNTING I (3-0-3)
This course is designed to provide a basic theory of accounting principles and practices used by service and merchandising enterprises. Emphasis is placed on financial accounting, including the accounting cycle, and financial statement preparation analysis.

BUS 242 PRINCIPLES OF ACCOUNTING II (3-0-3)
PREREQUISITE: BUS 241 with a grade of "C" or higher.
This course is a continuation of BUS 241. In addition to a study of financial accounting, this course also places emphasis upon managerial accounting, with coverage of corporations, statement analysis introductory cost accounting, and use of information for planning, control, and decision making.

BUS 263 THE LEGAL AND SOCIAL ENVIRONMENT OF BUSINESS (3-0-3)
This course provides an overview of the legal and social environment for business operations with emphasis on contemporary issues and their subsequent impact on business. Topics include the Constitution, the Bill of Rights, the legislative process, civil and criminal law, administrative agencies, trade regulations, consumer protection, contracts, employment, and personal property.

BUS 271 BUSINESS STATISTICS I (3-0-3)
PREREQUISITE: Appropriate score on Math Placement Test or MTH 100 or higher.
This is an introductory study of basic statistical concepts applied to economic and business problems. Topics include the collection, classification, and presentation of data, statistical description and analysis of data, measures of central tendency and dispersion, elementary probability, sampling, estimation and introduction to hypothesis testing.

BUS 272 BUSINESS STATISTICS II (3-0-3)
PREREQUISITE: BUS 271
This course is a continuation of BUS 271. Topics include sampling theory, statistical interference, regression and correlation, chi square, analysis of variance, time series index numbers, and decision theory.

BUS 275 PRINCIPLES OF MANAGEMENT (3-0-3)
This course provides a basic study of the principles of management. Topics include planning, organizing, staffing, directing, and controlling with emphasis on practical business applications.

BUS 276 HUMAN RESOURCE MANAGEMENT (3-0-3)
This course provides an overview of the responsibilities of the supervisor of human resources. Topics include the selection, placement, testing, orientation, training, rating, promotion, and transfer of employees.

BUS 277 MANAGEMENT SEMINAR (3-0-3)
This course offers study of current problems, issues, and developments in the area of management. Students are guided through individual projects and outside research related to their areas of concentration and employment training.

BUS 279 SMALL BUSINESS MANAGEMENT (3-0-3)
This course provides an overview of the creation and operation of a small business. Topics include buying a franchise, starting a business, identifying capital resources, understanding markets, managing customer credit, managing accounting systems, budgeting systems, inventory systems, purchasing insurance, and the importance of appropriate legal counsel.

BUS 284 ECONOMIC LABOR RELATIONS (3-0-3)
This is a basic management course in the field of labor. Topics include psychological and institutional factors, economic factors and economic analysis in such areas of the labor-management relations.
BUS 285 PRINCIPLES OF MARKETING (3-0-3)
This course provides a general overview of the field of marketing. Topics include marketing strategies, channels of distribution, marketing research, and consumer behavior.

BUS 291-292-293 ALTERNATING BUSINESS CO-OP I-II-III (1-3–0–1-3)
This three-course sequence allows students to alternate semesters of full-time work in a job closely related to the student's academic major with semesters of full-time academic work. Emphasis is placed on a student's work experience as it integrates academic knowledge with practical applications in the business environment. The grade is based on the employer's evaluation of student productivity, evaluative reports submitted by the student, and the development and assessment by the student of a learning contract.

BUS 296-297 BUSINESS INTERNSHIP I-II (3-0-3)
PREREQUISITE: Minimum 6 sem. hours completed. Minimum GPA 2.0 (C).
This two-course sequence allows the student to work part time on a job closely related to his/her academic major while attending classes on a full-time basis. Emphasis is placed on a student's work experience as it integrates academic knowledge with practical applications in the business environment. The grade is based on a term paper, job-site visits by the instructor, the employer's evaluation of the student, and the development and assessment by the student of a learning contract.

BUS 298 DIRECTED STUDIES (1-3–0–1-3)
This course offers independent study under faculty supervision. Emphasis is placed on subject relevancy and student interest and need.

## CHEMISTRY

CHM 104 INTRODUCTION TO INORGANIC CHEMISTRY (3-3-4)
PREREQUISITE: MTH 098 or higher or equivalent MTH 098 placement score.
This is a survey course of general chemistry for students who do not intend to major in science or engineering and may not be substituted for CHM 111. Lecture will emphasize the facts, principles, and theories of general chemistry including math operations, matter and energy, atomic structure, symbols and formulas, nomenclature, the periodic table, bonding concepts, equations, reactions, stoichiometry, gas laws, phases of matter, solutions, pH, and equilibrium reactions. Laboratory is required. CORE

CHM 105 INTRODUCTION TO ORGANIC CHEMISTRY (3-3-4)
PREREQUISITE: CHM 104 or CHM 111.
This is a survey course of organic chemistry and biochemistry for students who do not intend to major in science or engineering. Topics will include basic nomenclature, classification of organic compounds, typical organic reactions, reactions involved in life processes, function of biomolecules, and the handling and disposal of organic compounds. Laboratory is required. CORE

CHM 111 COLLEGE CHEMISTRY I (3-3-4)
CO-REQUISITE: MTH 112 or higher or equivalent math placement score.
This is the first course in a two-semester sequence designed for the science or engineering major who is expected to have a strong background in mathematics. Topics in this course include measurement, nomenclature, stoichiometry, atomic structure, equations and reactions, basic concepts of thermochemistry, chemical and physical properties, bonding, molecular structure, gas laws, kinetic-molecular theory, condensed matter, solutions, colloids, and some descriptive chemistry topics. Laboratory is required. CORE

CHM 112 COLLEGE CHEMISTRY II (3-3-4)
PREREQUISITE: CHM 111
This is the second course in a two-semester sequence designed primarily for the science and engineering student who is expected to have a strong background in mathematics. Topics in this course include chemical kinetics, chemical equilibria, acids and bases, ionic equilibria of weak electrolytes, solubility product principle, chemical thermodynamics, electrochemistry, oxidation-reduction, nuclear chemistry, an introduction to organic chemistry and biochemistry, atmospheric chemistry, and selected topics in descriptive chemistry including the metals, nonmetals, semi-metals, coordination compounds, transition compounds, and post-transition compounds. Laboratory is required. CORE

CHM 121 CHEMISTRY RECITATION I (1-0-1)
CO-REQUISITE: CHM 111
This course focuses on strengthening the student's problem solving skills as related to the content of CHM 111 (College Chemistry II).

CHM 122 CHEMISTRY RECITATION II (1-0-1)
CO-REQUISITE: CHM 112
This course focuses on strengthening the student's problem solving skills as related to the content of CHM 112 (College Chemistry I).

CHM 220 QUANTITATIVE ANALYSIS (3-3-4)
PREREQUISITE: CHM 112
This course covers the theories, principles, and practices in standard gravimetric, volumetric, calorimetric, and electrometric analysis with special emphasis on equilibrium in acid-base and oxidation-reduction reactions and stoichiometry of chemical equations. Laboratory is required and will include classical techniques in chemical analysis, modern methods of chemical separation, and basic instrumental techniques.
CHM 221 ORGANIC CHEMISTRY I (3-3-4)
PREREQUISITE: CHM 112
This is the first course in a two-semester sequence. Topics in this course include nomenclature, structure, physical and chemical properties, synthesis, and typical reactions for aliphatic, alicyclic, and aromatic compounds with special emphasis on reaction mechanisms, spectroscopy, and stereochemistry. Laboratory is required and will include the synthesis and confirmation of representative organic compounds with emphasis on basic techniques.

CHM 222 ORGANIC CHEMISTRY II (3-3-4)
PREREQUISITE: CHM 221
This is the second course in a two-semester sequence. Topics in this course include nomenclature, structure, physical and chemical properties, synthesis, and typical reactions for aliphatic, alicyclic, aromatic, and biological compounds, polymers and their derivatives, with special emphasis on reaction mechanisms, spectroscopy, and stereochemistry. Laboratory is required and will include the synthesis and confirmation of representative organic compounds with emphasis on basic techniques.

## CHILD DEVELOPMENT

CHD 100 INTRODUCTION TO EARLY CARE AND EDUCATION OF CHILDREN (3-0-3)
This course introduces the child care profession including the six functional areas of the Child Development Associate (CDA) credential. Emphasis is placed on using positive guidance techniques, setting up a classroom and planning a schedule. CORE

CHD 201 CHILD GROWTH AND DEVELOPMENT PRINCIPLES (3-0-3)
This course is a systematic study of child growth and development from conception through early childhood. Emphasis is placed on principles underlying physical, mental, emotional and social development, and on methods of child study and practical implications. CORE

CHD 202 CHILDREN'S CREATIVE EXPERIENCES (3-0-3)
This course focuses on fostering creativity in preschool children and developing a creative attitude in teachers. Topics include selecting and developing creative experiences in language arts, music, art, science, math and movement with observation and participation with young children required.

CHD 203 CHILDREN'S LITERATURE AND LANGUAGE DEVELOPMENT (3-0-3)
This course surveys appropriate literature and language arts activities designed to enhance young children's speaking, listening, pre-reading and writing skills. Emphasis is placed on developmental appropriateness as related to language.

CHD 204 METHODS AND MATERIALS FOR TEACHING CHILDREN (3-0-3)
This course introduces basic methods and materials used in teaching young children. Emphasis is placed on students compiling a professional resource file of activities used for teaching math, language arts, science and social studies concepts. CORE

CHD 205 PROGRAM PLANNING FOR EDUCATING YOUNG CHILDREN (3-0-3)
This course is designed to give students practice in lesson and unit planning, writing behavioral objectives, and evaluating activities taught to young children. Emphasis is placed on identifying basic aspects of cognitive development and how children learn. Upon completion students should be able to plan and implement developmentally appropriate curriculum and instructional practices based on knowledge of individual differences and the curriculum goals and content.

CHD 206 CHILDREN'S HEALTH AND SAFETY (3-0-3)
This course introduces basic health, nutrition and safety management practices for young children. Emphasis is placed on setting up and maintaining a safe, healthy environment for young children including specific procedures for infants and toddlers and procedures regarding childhood illnesses and communicable diseases.

CHD 209 INFANT AND TODDLER EDUCATION PROGRAMS (3-0-3)
This course focuses on child development from infancy to thirty months of age with emphasis on planning programs using developmentally-appropriate material. Emphasis is placed on positive ways to support an infant's social, emotional, physical and intellectual development.

CHD 210 EDUCATING EXCEPTIONAL YOUNG CHILDREN (3-0-3)
This course explores the many different types of exceptionalities found in young children. Topics include speech, language, hearing and visual impairments; gifted and talented children; mental retardation; emotional, behavioral, and neurological handicaps.

CHD 214 FAMILIES AND COMMUNITIES IN EARLY CARE AND EDUCATION PROGRAMS (3-0-3)
This course provides students with information about working with diverse families and communities. Students will be introduced to family and community settings, the importance of relationships with children, and the pressing needs of today's society. Students will study and practice techniques for developing these important relationships and effective communication skills.

CHD 215 SUPERVISED PRACTICAL EXPERIENCE IN EARLY CHILDHOOD EDUCATION (0-6-3)
PREREQUISITE: Advisor approval.
This course provides a minimum of 90 hours of hands-on, supervised experience in an approved program for young children. Emphasis is placed on performance of daily duties which are assessed by the College instructor and the cooperating teacher.

**COMPUTER SCIENCE**

DPT 103 INTRODUCTORY COMPUTER SKILLS II (3-0-3)
This course is designed to focus on the development of computer skills suited to the needs of students in non-degree occupational programs. The course will generally use software packages appropriate to occupational programs and may include such topics as word processing, database, basic graphics, spreadsheet or other features typically needed in the field. Upon completion, the student will be able to demonstrate proficiency by the completion of appropriate assignments and occupation-specific applications. NDC

CIS 146 MICROCOMPUTER APPLICATIONS (3-0-3)
This course is an introduction to the most common microcomputer software applications. These software packages should include typical features of applications, such as word processing, spreadsheets, database

CIS 147 ADVANCED MICRO APPLICATIONS (3-0-3)
PREREQUISITE: Grade "C" or better in CIS 146.
This course is a continuation of CIS 146 in which students utilize the advanced features of topics covered in CIS 146. Advanced functions and integration of word processing, spreadsheets, database, and presentation packages among other topics are generally incorporated into the course and are to be applied to situations found in society and business. Upon completion, the student should be able to apply the advanced features of selected software appropriately to typical problems found in society and business. This course will help prepare students for the MOS certification.

CIS 150 INTRODUCTION TO COMPUTER LOGIC AND PROGRAMMING (3-0-3)
This course includes logic, design and problem solving techniques used by programmers and analysts in addressing and solving common programming and computing problems. The most commonly used techniques of flowcharts, structure charts, and pseudocode will be covered and students will be expected to apply the techniques to designated situations and problems. CORE

CIS 155 INTRODUCTION TO MOBILE APP DEVELOPMENT (3-0-3)
The purpose of this course is to introduce students to various app development tools for various mobile platforms. Specific topics include: app distribution sources, mobile device operating systems, survey of app development software, process for design, build, deploying, and optimizing apps. At the conclusion of this course, students will be able to design, build, deploy, and optimize a basic app.

CIS 161 INTRODUCTION TO NETWORK COMMUNICATION (3-0-3)
This course is designed to introduce students to basic concepts of computer networks. Emphasis is placed on terminology and technology involved in implementing selected networked systems. The course covers various network models, topologies, communications protocols, transmission media, networking hardware and software, and network troubleshooting. Students gain hands-on experience in basic networking. This course further helps prepare students for certification. CORE
*NOTE: This course is a suitable substitute for CIS 199. Additionally, CISCO I may be used as a suitable substitute for this course. However, CIS 273 will not substitute for CISCO I.*

CIS 171 LINUX I (3-0-3)
This course presents fundamental applications in Linux. Included in this course are skills development for the OS installation and setup, recompile techniques, system configuration settings, file/folder structures and types, run levels, basic network applications, and scripting. Additionally, the course presents security from an administrative and user consideration.

CIS 207 INTRODUCTION TO WEB DEVELOPMENT (3-0-3)
At the conclusion of this course, students will be able to use specified markup languages to develop basic Web pages.

CIS 208 WEB AUTHORING SOFTWARE (3-0-3)
Students utilize various Web authoring tools to construct and edit websites for a variety of applications. Upon completion students will be able to use these tools to develop or enhance websites.

CIS 209 ADVANCED WEB DEVELOPMENT (3-0-3)
PREREQUISITE: Grade "C" or better in a programming language or CIS 207 or CIS 208 or instructor approval.
This is an advanced Web design course emphasizing the use of scripting languages to develop interactive Web sites. Upon completion students will be able to create data driven Web sites. This course helps prepare students for the Certified Internet Webmaster (CIW) Foundations certification.

CIS 222 DATABASE MANAGEMENT SYSTEMS (3-0-3)
This course will discuss database system architectures, concentrating on Structured Query Language (SQL). It will teach students how to design, normalize and use databases with SQL, and to link those to the Web.

CIS 245 CYBER DEFENSE (3-0-3)
The course provides students with information on the concept of cyber defense. Topics include information relative to legal aspects of cyber attacks, threats to various levels of national and local social infrastructure, financial systems, personal data, and other direct and indirect threats. As part of this course, students explore current and historical cyber threats and U.S. policy regarding infrastructure protection.

CIS 249 MICROCOMPUTER OPERATING SYSTEMS (3-0-3)
This course provides an introduction to microcomputer operating systems.

Topics include a description of the operating system, system commands, and effective and efficient use of the microcomputer with the aid of its system programs. Upon completion, students should understand the function and role of the operating system, its operational characteristics, its configuration, how to execute programs, and efficient disk and file management.

CIS 251 C++ PROGRAMMING (3-0-3)
This course is an introduction to the C++ programming language including object oriented programming. Topics include: problem solving and design; control structures; objects and events; user interface construction; and document and program testing.

CIS 268 SOFTWARE SUPPORT (3-0-3)
This course provides students with hands-on practical experience in installing computer software, operating systems, and trouble-shooting. The class will help to prepare participants for the A+ Certification sponsored by CompTIA. This course is a suitable substitute for CIS 239, Networking Software. CORE

CIS 269 HARDWARE SUPPORT (3-0-3)
This course provides students with hands-on practical experience in installation and troubleshooting computer hardware. The class will help to prepare participants for the A+ Certification sponsored by CompTIA. This is a suitable substitute for CIS 240, Networking Hardware. CORE

CIS 281 SYSTEM ANALYSIS AND DESIGN (3-0-3)
This course is a study of contemporary theory and systems analysis and design. Emphasis is placed on investigating, analyzing, designing, implementing, and documenting computer systems. Upon completion, the student will be able to demonstrate knowledge of the topics through the completion of programming projects and appropriate tests.

CIS 284 CIS INTERNSHIP (0-15-3)
This course is designed to provide the student with an opportunity to work in a degree/program related environment. Emphasis is placed on the student's "real world" work experience as it integrates academics with practical applications that relate meaningfully to careers in the computer discipline. Significance is also placed on the efficient and accurate performance of job tasks as provided by the "real world" work experience. Grades for this course will be based on a combination for the employer's evaluation of the student, and the contents of a report submitted by the student. Upon completion of this course, the student should be able to demonstrate the ability to apply knowledge and skills gained in the classroom to a "real world" work experience.

CIS 285 OBJECT ORIENTED PROGRAMMING (3-0-3)
This course is an advanced object-oriented programming course and covers advanced program development techniques and concepts in the context of an object-oriented language. Subject matter includes object-oriented analysis and design, encapsulation, inheritance, polymorphism (operator and function overloading), information hiding, abstract data types, reuse, dynamic memory allocation, and file manipulation. Upon completion, students should be able to develop a hierarchical class structure necessary to the implementation of an object-oriented software system.

CIS 286 COMPUTERIZED MANAGEMENT INFO SYSTEMS (EXCEL) (3-0-3)
This course teaches the nature of computerized management information systems, problems created by the computer relative to personnel, components of computer systems, programming, and application of computers to business problems.

## COMPUTERIZED NUMERICAL CONTROL

CNC 101 INTRODUCTION TO CNC (2-8-6)
This is an introductory course with emphasis placed in the basic concepts and terminology of numerical control. Topics include Cartesian coordinate system, CNC principles and machine capabilities. Student will gain an understanding of CNC machine tools and their usage.

CNC 103 MANUAL PROGRAMMING (2-8-6)
This course will emphasize calculations for CNC machine tools. Topics will include G & M codes, radius programming and cutter compensations. Students will learn to write a variety of CNC programs which can be used on the job as reference programs.

CNC 104 CNC MILLING OPERATIONS (3-6-6)
This is a course in programming and operations of the CNC Milling Machines. Applications include maintenance, safety, and production of machine parts through programming, set-up and operation. Students will learn to produce finished parts on the CNC milling machines.

CNC 112 COMPUTER NUMERICAL CONTROL TURNING (1-4-3)
This course introduces the programming, setup, and operation of CNC turning centers. Topics include programming formats, control functions, program editing, part production, and inspection. Upon completion, students should be able to manufacture simple parts using the CNC turning center.

CNC 113 COMPUTER NUMERIC CONTROL MILLING (1-4-3)
This course introduces the manual programming, setup, and operation of CNC machining centers. Topics include programming formats, control functions, program editing, part production, and inspection. Upon completion, students should be able to manufacture simple parts using CNC machining centers.

CNC 181 SPECIAL TOPICS IN COMPUTERIZED NUMERICAL CONTROL I (1-4-3)
This course provides specialized instruction in selected areas related to CNC.

CNC 222 COMPUTER NUMERICAL CONTROL GRAPHICS: TURNING (1-4-3)
This course introduces Computer Numerical Control graphics programming and concepts for turning center applications. Emphasis is placed on the interaction of menus to develop a shape file in a graphics CAM system and to develop tool path geometry and part geometry. Upon completion, students should be able to develop a job plan using CAM software, include machine selection, tool selection, operational sequence, speed, feed and cutting depth.

CNC 223 COMPUTER NUMERICAL CONTROL GRAPHICS PROGRAMMING: MILLING (1-4-3)
This course introduces Computer Numerical Control graphics programming and concepts for machining center applications. Emphasis is placed on developing a shape file in a graphics CAM system and transferring coded information from CAM graphics to the CNC milling center. Upon completion, students should be able to develop a complete job plan using CAMM software to create a multi-axis CNC program.

CNC 229 TOTAL QUALITY MANAGEMENT (3-0-3)
This is an introductory course designed to cover Total Quality Management (TQM) concepts. Topics include common direction, team building, statistical analysis, and problem solving skills and techniques. Upon completion, students will acquire a knowledge in TQM as it relates to the industrial setting.

CNC 241 CNC MILLING LAB (0-6-3)
This course covers basic (3-axis) computer numeric control (CNC) milling machine setup and operating procedures. Upon completion, the student should be able to load a CNC program and setup and operate a 3-axis CNC milling machine to produce a specified part. Related safety, inspection, and process adjustment are also covered.

CNC 242 CNC MILLING LAB II (0-6-3)
This course covers advanced (including 4-axis) computer numeric control (CNC) milling machine setup and operating procedures. Upon completion, the student should be able to load a CNC program and set up and operate a CNC milling machine (including 40-axis) to produce a specified part. Related safety and inspection and process adjustment are also covered.

CNC 243 CNC TURNING LAB (0-6-3)
This course covers basic computer numeric control (CNC) turning machine setup and operating procedures (inner diameter and outer diameter). Upon completion, the student should be able to load a CNC program and setup and operate a CNC turning machine to produce a simple part. Related safety and inspection and process adjustment are also covered.

CNC 281 SPECIAL TOPICS IN CNC II (1-4-3)
This course provides specialized instruction in various areas related to CNC. Emphasis is placed on individualized student needs.

## COSMETOLOGY

COS 111 INTRODUCTION TO COSMETOLOGY (3-0-3)
COREQUISITE: COS 112/BAR 113
This course is designed to provide students with an overview of the history and development of cosmetology and standards of professional behavior. Students receive basic information regarding principles and practices of

infection control, diseases, and disorders. Additionally students receive introductory information regarding hair design. The information presented in this course is enhanced by hands-on application performed in a controlled lab environment. Upon completion, students should be able to apply safety rules and regulations and write procedures for skills identified in this course. CORE

COS 112 INTRODUCTION TO COSMETOLOGY LAB (0-9-3)
COREQUISITE: COS 111/BAR 110
In this course, students are provided the practical experience for sanitation, shampooing, hair shaping, and hairstyling. Emphasis is placed on sterilization, shampooing, hair shaping, and hairstyling for various types of hair for men and women. This course offers opportunities for students to put into practice concepts learned in the theory component from COS 111. CORE

COS 113 THEORY OF CHEMICAL SERVICES (3-0-3)
During this course students learn concepts of theory of chemical services related to the chemical hair texturing. Specific topics include basics of chemistry and electricity, properties of the hair and scalp, and chemical texture services. Safety considerations are emphasized throughout this course. This course is foundational for other courses providing more detailed instruction on these topics. CORE

COS 114 CHEMICAL SERVICES LAB (0-9-3)
During this course students perform various chemical texturing activities. Emphasis is placed on cosmetologist and client safety, chemical use and handling, hair and scalp analysis, and client consulting. CORE

COS 115 HAIR COLORING THEORY (3-0-3)
In this course, students learn the techniques of hair coloring and hair lightening. Emphasis is placed on color application, laws, levels and classifications of color and problem solving. Upon completion, the student will should be able to identify all classifications of haircoloring and the effects on the hair. CORE

COS 116 HAIR COLORING LAB (0-9-3)
In this course, students apply hair coloring and hair lightening techniques. Topics include consultation, hair analysis, skin test and procedures and applications of all classifications of hair coloring and lightening. Upon completion, the student will be able to perform procedures for hair coloring and hair lightening. CORE

COS 117 BASIC SPA TECHNIQUES (3-0-3)
This course is the study of cosmetic products, massage, skin care, and hair removal, as well as identifying the structure and function of various systems of the body. Topics include massage skin analysis, skin structure, disease and disorder, light therapy, facials, facial cosmetics, anatomy, hair removal, and nail care. Upon completion, the student will be able to state procedures for analysis, light therapy, facials, hair removal, and identify the structures, functions, disorders of the skin, and nail care. CORE

COS 118 BASIC SPA TECHNIQUES LAB (0-9-3)
This course provides practical applications related to the care of the skin and related structure. Emphasis is placed on facial treatments, product application, skin analysis, massage techniques, facial make-up, hair removal, and nail care. Upon completion, the student should be able to prepare clients, assemble sanitized materials, follow procedures for product application, recognize skin disorders, demonstrate facial massage movement, cosmetic application, and hair removal using safety and sanitary precautions, and nail care. CORE

COS 119 BUSINESS OF COSMETOLOGY (3-0-3)
This course is designed to develop job-seeking and entry-level management skills for the beauty industry. Topics include job seeking, leader and entrepreneurship development, business principles, business laws, insurance, marketing, and technology issues in the workplace. Upon completion, the student should be able to list job-seeking and management skills and the technology that is available for use in the salon.

COS 123 COSMETOLOGY SALON PRACTICES (0-9-3)
This course is designed to allow students to practice all phases of cosmetology in a salon setting. Emphasis is placed on professionalism, receptionist duties, hair styling, hair shaping, chemical, and nail and skin services for clients. Upon completion, the student should be able to demonstrate professionalism and the procedures of cosmetology in a salon setting.

COS 141 APPLIED CHEMISTRY FOR COSMETOLOGY (0-9-3)
This course focuses on chemistry relevant to professional hair and skin care products, hair and its related structures, permanent waving, chemical hair relaxing, and hair coloring. Topics include knowledge of basic chemistry, pH scale measurements, water, shampooing and cosmetic chemistry, physical and chemical changes in hair structure. Upon completion, the student should be able to define chemistry, types of matter, and describe chemical and cosmetic reactions as related to the hair and skin structure.

COS 142 APPLIED CHEMISTRY FOR COSMETOLOGY LAB (0-9-3)
This course provides practical applications of the knowledge and skin learned in reference to chemical reactions, as well as the chemical application to the hair and skin. Emphasis is placed on knowledge of basic chemistry, ph scale, cosmetic chemistry, and physical and chemical changes in the hair and skin structure. Upon completion, the student should be able to determine the proper chemical product for each prescribed service.

COS 145 HAIR SHAPING LAB (0-9-3)
This covers the study of the art and techniques of hair shaping. Topics include hair sectioning, correct use of hair shaping implements, and elevations used to create design lines. Upon completion, the student should be able to demonstrate the techniques and procedures for creating hair designs using safety and sanitary precautions.

COS 152 NAIL CARE APPLICATIONS (0-9-3)
This course provides practice in all aspects of nail care. Topics include salon conduct, professional ethics, bacteriology, sanitation and safety, manicuring and pedicuring. Upon completion, the student should be able to perform nail care procedures.

COS 154 NAIL ART APPLICATIONS (0-9-3)
This course provides practice in advanced nail techniques. Topics include acrylic, gel, fiberglass nails, and nail art. Upon completion, the student should be able to perform the procedures for nail sculpturing and nail art.

COS 162 SPECIAL TOPICS IN COSMETOLOGY (0-9-3)
This course is designed to allow students to explore issues relevant to the profession of cosmetology. Upon completion, students should have developed new skills in areas of specialization for the cosmetology profession.

COS 167 STATE BOARD REVIEW (1-6-3)
Students are provided a complete review of all procedures and practical skills pertaining to their training in the program. Upon completion, the student should be able to demonstrate the practical skills necessary to complete successfully the required State Board of Cosmetology examination and entry-level employment.

COS 181 SPECIAL TOPICS (3-0-3)
This course is designed to allow students to explore issues relevant to the profession of cosmetology. Upon completion, students should have developed new skills in areas of specialization for the cosmetology profession.

COS 182 SPECIAL TOPICS (0-9-3)
This course is designed to allow students to explore issues relevant to the profession of cosmetology. Upon completion, students should have developed new skills in areas of specialization for the cosmetology profession.

COS 190 INTERNSHIP IN COSMETOLOGY (0-15-3)
This course is designed to provide exposure to cosmetology practices in non-employment situations. Emphasis is on dependability, attitude, professional judgment, and practical cosmetology skills. Upon completion, the student should have gained skills necessary for entry-level employment.

COS 291 CO-OP (0-15-3)
This course provides work experience with a college-approved employer in an area related to the student's program of study. Emphasis is placed on integrating classroom learning with related work experience. Upon completion, students should be able to evaluate career selection, demonstrate employability skills, and satisfactorily perform work-related competencies.

## COSMETOLOGY INSTRUCTOR TRAINING

CIT 211 TEACHING AND CURRICULUM DEVELOPMENT (3-0-3)
This course focuses on principles of teaching, teaching maturity, personality conduct, and the development of cosmetology curriculum. Emphasis is placed

on teacher roles, teaching styles, teacher challenges, aspects of curriculum development, and designing individual courses. Upon completion, the student should be able to describe the role of teacher, identify means of motivating students, develop a course outline, and develop lesson plans. CORE

CIT 212 TEACHER MENTORSHIP (0-9-3)
This course is designed to provide the practice through working with a cosmetology instructor in a mentoring relationship. Emphasis is placed on communication, student assessment, and assisting students in the lab. Upon completion, the student should be able to communicate with students, develop a course of study, and apply appropriate teaching methods. CORE

CIT 213 LESSON PLAN DEVELOPMENT (3-0-3)
This course introduces students to methods for developing lesson plans. Emphasis is placed on writing lesson plans and on the four-step teaching plan. Upon completion, students should be able to write daily lesson plans and demonstrate the four-step teaching method. CORE

CIT 221 LESSON PLAN IMPLEMENTATION (0-9-3)
This course is designed to provide practice in preparing and using lesson plans. Emphasis is placed on organizing, writing, and presenting lesson plans using the four-step teaching method. Upon completion, students should be able to prepare and present a lesson using the four step teaching method. CORE

CIT 222 INSTRUCTIONAL MATERIALS AND METHODS (3-0-3)
This course focuses on visual and audio aids and materials. Emphasis is placed on the use and characteristics of instructional aids. Upon completion, the student should be able to prepare teaching aids and determine their most effective use. CORE

CIT 223 INSTRUCTIONAL MATERIALS AND METHODS APPLICATIONS (0-9-3)
This course is designed to provide practice in preparing and using visual and audio aids and materials. Emphasis is placed on the preparation and use of different categories of instructional aids. Upon completion, the student should be able to prepare and effectively present different types of aids for use with a four step lesson plan. CORE

## CRIMINAL JUSTICE

CRJ 100 INTRODUCTION TO CRIMINAL JUSTICE (3-0-3)
This course surveys the entire criminal justice process from law enforcement to the administration of justice through corrections. It discusses the history and philosophy of the system and introduces various career opportunities.

CRJ 110 INTRODUCTION TO LAW ENFORCEMENT (3-0-3)
This course examines the history and philosophy of law enforcement, as well as the organization and jurisdiction of local, state, and federal agencies. It includes the duties and functions of law enforcement officers.

CRJ 150 INTRODUCTION TO CORRECTIONS (3-0-3)
This course provides an introduction to the philosophical and historical foundations of corrections in America. Incarceration and some of its alternatives are considered.

CRJ 160 INTRODUCTION TO SECURITY (3-0-3)
PREREQUISITE: As required by program.
This course surveys the operation, organization and problems in providing safety and security to business enterprises. Private, retail, and industrial security are covered.

## DIESEL MECHANICS

DEM 104 BASIC ENGINES (1-4-3)
This course is designed to give the student knowledge of the diesel engine components and auxiliary systems, the proper way to maintain them, and the proper procedures for testing and rebuilding components. Emphasis is placed on safety, theory of operation, inspection, and measuring and rebuilding diesel engines according to factory specifications. Upon completion students should be able to measure, diagnose problems, and repair diesel engines.

DEM 105 PREVENTIVE MAINTENANCE (1-4-3)
This course provides instruction on how to plan, develop, and install equipment surveillance and reliability strategies. Descriptions of various maintenance techniques for specialized preventive programs are discussed and computerized parts and equipment inventories and fleet management systems software are emphasized. Upon completion, students should be able to set-up and follow a preventive maintenance schedule as directed by manufacturers.

DEM 108 DOT VEHICLE INSPECTION (1-0-1)
This course introduces the student to the Department of Transportation Vehicle Inspection procedures. Emphasis is placed on inspecting Class 8 truck tractors and trailers. Upon completion, students should be able to perform the Federal Vehicle Inspection on Class 8 truck tractors and trailers.

DEM 111 EQUIPMENT SAFETY AND MECHANICAL FUNDAMENTALS (1-4-3)
This course provides instruction in shop and vehicle safety. Topics include the safe use and handling of hand and power tools, preventive maintenance, and safety inspection procedures. Upon completion, students should be able to demonstrate knowledge of preventive maintenance and applicable general safety in vehicle repair.

DEM 117 DIESEL AND GAS TUNE-UP (1-4-3)
This course introduces tune-up and troubleshooting according to manufacturers' specifications. Topics include troubleshooting engine systems, tune-up procedures, and use and care of special test tools and equipment. Upon completion, students should be able to troubleshoot, diagnose, and repair engines and components using appropriate diagnostic equipment.

DEM 123 PNEUMATIC AND HYDRAULICS (1-4-3)
This course provides instruction in the identification and repair of components found in hydraulic and pneumatic systems. Topics include schematics and symbols used in fluid power transmission and the troubleshooting of components in these systems. Upon completion, students should be able to diagnose, adjust, and repair hydraulic and pneumatic system components.

DEM 124 ELECTRONIC ENGINE SYSTEMS (1-4-3)
This course introduces the principles of electronically controlled diesel engines. Emphasis is placed on testing and adjusting diesel engines in accordance with manufacturers' specifications. Upon completion, students should be able to diagnose, test, and calibrate electronically controlled diesel engines.

DEM 125 HEAVY VEHICLE DRIVE TRAINS (1-4-3)
This course introduces the operating principles of mechanical medium and heavy duty truck transmissions. Topics include multiple counter shafts, power take-offs, slider idler clutches, and friction clutches, mechanical transmission power components, and hydraulics. Upon completion, students should be able to diagnose, inspect, and repair mechanical transmissions. CORE

DEM 126 ADVANCED ENGINE ANALYSIS (1-4-3)
This course provides instruction in the disassembly, inspection, and rebuilding of diesel and heavy-duty gas engines. Emphasis is placed on the manufacturer's standards and factory recommended service tools and equipment. Upon completion, students should be able to disassemble, inspect, and rebuild engines according to the manufacturer's specifications. CORE

DEM 127 FUEL SYSTEMS (1-4-3)
This course is designed to provide practice in troubleshooting, fault code diagnosis, information retrieval, calibration, repair and replacement of fuel injectors, nozzles, and pumps. Emphasis is placed on test equipment, component functions, and theory. Upon completion, students should be able to diagnose, service, and repair fuel systems and governors.

DEM 128 HEAVY VEHICLE DRIVE TRAIN LAB (0-4-3)
This lab provides reinforcement of material covered in DEM 116 or DEM 125. The students will apply the knowledge they learned on driveshafts, power take-offs, standard transmissions, fluid drives, torque converters, clutch assemblies, drive axles, and special drives through experiential learning techniques. Upon completion, student should be able to diagnose, inspect, remove, repair or replace, and install heavy vehicle drive train components.

DEM 134 COMPUTER CONTROLLED ENGINE AND POWER TRAIN SYSTEMS (3-0-3)
PREREQUISITE: VTR 112/DEM 130
This course introduces the student to the fundamentals of operation of computer controlled engine and power train systems..

DEM 180 SPECIAL PROJECTS IN COMMERCIAL VEHICLES
PREREQUISITE: DEM 125
This course provides specialized instruction in various areas related to the diesel mechanics industry. Emphasis is placed on meeting student's needs.

## DRAFTING DESIGN ENGINEERING TECHNOLOGY

DDT 104 BASIC COMPUTER AIDED DRAFTING AND DESIGN (1-4-3)
This course provides an introduction to basic Computer Aided Drafting and Design (CADD) functions and techniques, using hands-on applications. Topics include terminology, hardware, basic CADD and operating system functions, file manipulation, and basic CADD software applications in producing softcopy and hardcopy. CORE

DDT 111 FUNDAMENTALS OF DRAFTING AND DESIGN TECHNOLOGY (1-4-3)
This course serves as an introduction to the field of drafting and design and provides a foundation for the entire curriculum. Topics include safety, lettering, tools and equipment, geometric constructions, and orthographic sketching, and drawing. CORE

DDT 115 BLUEPRINT READING FOR MACHINISTS (3-0-3)
This course provides the students with terms and definitions, theory of orthographic projection, and other information required to interpret drawings used in the machine trades. Topics include multiview projection, pictorial drawings, dimensions and notes, lines and symbols, and sketching. Upon completion, students should be able to interpret blueprint drawings used in the machine trades.

DDT 116 BLUEPRINT READING FOR CONSTRUCTION (3-0-3)
This course provides the students with terms and definitions, theory or orthographic projection, and other information required to interpret drawings used in the construction trades. Topics include multiview projection, dimensions and notes, lines and symbols, sketching, foundations plans, site plans, floor plans, elevations, sections, details, schedules, electrical plans and specifications. Upon completion, students should be able to interpret blueprint drawings used in the construction and building trades.

DDT 117 MANUFACTURING PROCESSES (3-0-3)
This course in materials and processes includes the principles and methodology of material selection, application, and manufacturing processes. Emphasis is directed to solids to include material characteristics, castings, forging, and die assemblies. Upon completion, students should be able to discuss and understand the significance of materials' properties, structure, basic manufacturing processes, and express and interpret material specifications.

DDT 118 BASIC ELECTRICAL DRAFTING (1-4-3)
This course covers the universal language of electrical drafting, including electrical lines, symbols, abbreviations, and notation. Emphasis is place on typical components such as generators, controls, transmission networks, and lighting, heating, and cooling devices. Upon completion, students should be able to draw basic diagrams of electrical and electronic circuits using universally accepted lines and symbols.

DDT 124 BASIC TECHNICAL DRAWING (1-4-3)
This course covers sections, auxiliary views, and basic space geometry. Emphasis will be placed on the theory as well as the mechanics of applying sections, basic dimensioning, auxiliary views, and basic space geometry. CORE

DDT 125 SURFACE DEVELOPMENT (1-4-3)
PREREQUISITE: As required by college.
This course covers sections, auxiliary views, and basic space geometry. Emphasis will be placed on the theory as well as the mechanics of applying sections, basic dimensioning, auxiliary views, and basic space geometry. CORE

DDT 127 INTERMEDIATE COMPUTER AIDED DRAFTING AND DESIGN (1-4-3)
PREREQUISITE: DDT 104, DDT 111, DDT 124 or advisor approval.
This course covers intermediate-level concepts and applications of CADD. Emphasis will be placed on intermediate-level features, command, and applications of CADD software. CORE

DDT 128 INTERMEDIATE TECHNICAL DRAWING (1-4-3)
PREREQUISITE: DDT 111, DDT 124 or advisor approval.
This course is designed to develop a strong foundation in common drafting and design practices and procedures. Topics include dimensioning concepts and pictorial drawings. CORE

DDT 130 FUNDAMENTALS OF DRAFTING FOR RELATED TRADES (3-0-3)
PREREQUISITE: As required by college.
This course is an applications lab for the theory of related trades drafting. Topics include civil, piping, electronic and welding drawings. Upon completion, students should be able to produce drawings to convey basic information related to these fields.

DDT 131 MACHINE DRAFTING BASICS (1-4-3)
PREREQUISITE: DDT 104, DDT 111, DDT 124 or advisor approval.
This course in machine drafting and design provides instruction in the largest speciality area of drafting in the United States, in terms of scope and job opportunities. Emphasis will be placed on the applications of multi-view drawings, including drawing organization and content, title blocks and parts lists, assembly drawings, detail drawings, dimensioning and application of engineering controls in producing industrial-type working drawings. Upon completion, students should be able to organize, layout, and produce industrial-type working drawings, including the application of title blocks, parts lists, assemblies, details, dimensions, and engineering controls.

DDT 132 ARCHITECTURAL DRAFTING (1-4-3)
PREREQUISITE: DDT 104, DDT 111, DDT 124 or advisor approval.
This course in architectural design and drafting introduces basic terminology, concepts and principles of architectural design and drawing. Topics include design considerations, lettering, terminology, site plans, and construction drawings. Upon completion, students should be able to draw, dimension, and specify basic residential architectural construction drawings.

DDT 133 BASIC SURVEYING (1-4-3)
This course covers the use of surveying instruments, mathematical calculations and the theory of land surveying. Topics include USGS benchmarks, measuring horizontal and vertical angles and distances, terms, and recording and interpreting field notes. Upon completion, students should be able to recognize benchmarks and measure, specify, and record field notes.

DDT 134 DESCRIPTIVE GEOMETRY (1-4-3)
PREREQUISITE: DDT 111, DDT 124 or advisor approval.
This course is designed to teach the fundamental concepts of descriptive geometry with an emphasis on logical reasoning, visualization, and practical applications. Topics include orthographic projection, points and lines in space, auxiliary views, plane representation, intersecting and non-intersecting lines, piercing and intersecting planes, plane development, and calculations. Upon completion, students should be able to project and intersect points, lines, and planes, with their relationships in space.

DDT 139 FUNDAMENTALS OF DRAFTING FOR RELATED TRADES LAB (0-3-3)
PREREQUISITE: As required by college.
This course is an applications lab for the theory of related trades drafting. Topics include civil, piping, electronic and welding drawings. Upon completion, students should be able to produce drawings to convey basic information related to these fields.

DDT 144 BASIC 3D MODELING (1-4-3)
PREREQUISITE: As required by college.
This course is an introduction to 3D solid modeling techniques utilizing feature-based, constraint-based parametric design. This course encourages the student to visualize parts in the 3D world and have a "design intent" plan for each part in which they will design. Upon completion of the course students should be able to create basic 3D models and 2D working drawings.

DDT 150 THEORY OF RESIDENTIAL DRAWING AND DESIGN (3-0-3)
PREREQUISITE: As required by college.
This course provides the theory of residential drawing and design. Topics

include architectural styles, house design, site and space planning, environment, drawing requirements, construction materials and process, terminology, and specific types of drawings required to complete a full set of construction documents. Introductory and intermediate level topics are covered. Emphasis is placed on an understanding of the various issues and requirements essential to the field of residential drawing and design.

DDT 181 SPECIAL TOPICS IN DRAFTING AND DESIGN TECHNOLOGY (1-2-3)
This course provides specialized instruction in various areas related to the drafting industry. Emphasis is placed on meeting students' needs.

DDT 182 SPECIAL TOPICS IN DRAFTING AND DESIGN TECHNOLOGY (1-2-3)
PREREQUISITE: DDT 104, DDT 111, DDT 124.
This course provides specialized instruction in various areas related to the drafting industry. Emphasis is placed on meeting students' needs.

DDT 183 SPECIAL TOPICS IN DRAFTING AND DESIGN TECHNOLOGY (3-0-3)
PREREQUISITE: DDT 104, DDT 111, DDT 124.
This course provides specialized instruction in various areas related to the drafting industry. Emphasis is placed on meeting students' needs.

DDT 191 DRAFTING INTERNSHIP (0-5-1)
PREREQUISITE: As required by college.
This course is designed for those who are involved in a structured employment situation that is directly related to the field of drafting and design and is coordinated with the drafting instructor. The student must spend at least 5 hours per week in an activity planned and coordinated jointly by the instructor and the employer. Upon completion, the student will have gained valuable work experience in a well-planned, coordinated training/work situation.

DDT 192 DRAFTING INTERNSHIP (0-10-2)
PREREQUISITE: As required by college.
This course is limited to those who are involved in a structured employment situation that is directly related to the field of drafting and design and is coordinated with the drafting instructor. The student must spend at least 10 hours per week in an activity planned and coordinated jointly by the instructor and the employer. Upon completion, the student will have gained valuable work experience in a well-planned, coordinated training/work situation.

DDT 193 DRAFTING INTERNSHIP (0-15-3)
PREREQUISITE: As required by college.
This course is limited to those who are involved in a structured employment situation that is directly related to the field of drafting and design and is coordinated with the drafting instructor. The student must spend at least 15 hours per week in an activity planned and coordinated jointly by the instructor and the employer. Upon completion, the student will have gained valuable work experience in a well-planned, coordinated training/work situation.

DDT 211 INTERMEDIATE MACHINE DRAFTING (1-4-3)
PREREQUISITE: DDT 104, DDT 111, DDT 124, DDT 131 or advisor approval.
This second course in machine drafting and design provides more advanced instruction in the largest speciality area of drafting. Topics include applications of previously developed skills in the organization and development of more complex working drawings, use of vendor catalogs and the Machinery's Handbook for developing specifications, and use of standardized abbreviations in working drawings.

DDT 212 INTERMEDIATE ARCHITECTURAL DRAFTING (1-4-3)
PREREQUISITE: As required by college.
This second course in architectural design and drafting continues with more advanced and detailed architectural plans. Topics include interior elevations, plot plans, and interior details. Upon completion, students should be able to draw and specify advanced level plans including various architectural details.

DDT 213 CIVIL DRAFTING PLAT MAPS (1-4-3)
PREREQUISITE: DDT 104, DDT 111, DDT 124 or advisor approval.
This course introduces the drafting practices, symbols, conventions, and standards utilized in civil engineering contract documents. Topics include site planning, land surveying, topographic surveys, along with civil terminology. Upon completion, students should be able to draw accurate plat maps giving legal descriptions of land parcels, draw simple site plans, and identify and use proper symbols and conventions on civil engineering drawings.

DDT 214 PIPE DRAFTING (1-4-3)
PREREQUISITE: DDT 104, DDT 111, DDT 124.
This course covers the theory and practical applications necessary to understand piping fundamentals as used in refineries and petrochemical plants. Topics include process and mechanical flow diagrams, plant equipment, isometric drawings, instrumentation symbols, pipe symbols, flanges, fittings, and applications of basic math and trigonometry. Upon completion, students should be able to demonstrate pipe drafting techniques and fundamentals in order to prepare working drawings used in refineries and the petrochemical industrial environment.

DDT 215 GEOMETRIC DIMENSIONING & TOLERANCING (1-4-3)
PREREQUISITE: DDT 104, DDT 111, DDT 124 or advisor approval.
This course is designed to teach fundamental concepts of size description by geometric methods including appropriate engineering controls. Emphasis is placed on the drawing and application of common geometric dimensioning and tolerancing symbols to engineering drawings as designated by the latest ANSI/ASME Standards. Upon completion, students should be able to use geometric dimensioning and tolerancing symbols in applying size information and manufacturing controls to working drawings.

DDT 216 DESIGN OF STRUCTURAL WOOD MEMBERS (3-0-3)
PREREQUISITE: DDT 104, DDT 111, DDT 124.
This course provides structural theory and rule-to-thumb design for structural wood members. Joists, beams, girders, rafters, posts, and columns are designed as related to residential and light commercial needs. Bending moment, shear, and slenderness rations are discussed as well as code requirements and rule-of-thumb. Emphasis is placed upon competency.

DDT 220 ADVANCED TECHNICAL DRAWING (1-4-3)
This course covers the method of providing size description and manufacturing information for production drawings. Emphasis will be placed on accepted dimensioning and tolerancing practices, including Geometric Dimensioning and Tolerancing for both the Customary English System and the ISO system, fasteners, and welding symbols. Upon completion students should be able to apply dimensions, tolerances, and notes to acceptable standards, including GDT and produce drawings using and specifying common threads and fasteners including welding methods.

DDT 222 ADVANCED ARCHITECTURAL DRAFTING (1-4-3)
PREREQUISITE: DDT 104, DDT 111, DDT 124, DDT 132 or advisor approval.
This third course in architectural design and drafting continues with advanced architectural plans, including a slant toward light commercial construction. Topics include climate control plans, application of building codes, building materials and finish specifications, cost estimating, and bid specifications. Upon completion, students should be able to apply current techniques in producing advanced-level architectural plans, including residential and light commercial applications.

DDT 224 STRUCTURAL CONCRETE DRAFTING (1-4-3)
This course is designed to develop the knowledge and skills necessary to understand the basic components and terminology of pre-cast and poured-in-place concrete structures. Emphasis is placed on pre-cast concrete framing plans, sections, fabrication and connection details, poured-in-place concrete foundations, floor systems, and bills of material. Upon completion, students should be able to do construction engineering and shop drawings of concrete beams, column, floor, roof, and wall framing plans using the A.I.S.C. Manual and incorporating safety practices.

DDT 225 STRUCTURAL STEEL DRAFTING (1-4-3)
This course covers the theory and practical applications necessary to understand the basic design and terminology of structural steel components used in light commercial buildings. Emphasis is placed on structural steel drafting techniques, bolted and welded connections, framing plans, sections, fabrication and connection details, and bills of material. Upon completion, students should be able to produce engineering and shop drawings incorporating standard shapes, sizes, and details using the A.I.S.C. Manual and incorporating safety practices.

DDT 226 TECHNICAL ILLUSTRATION (1-4-3)
PREREQUISITE: DDT 111, DDT 124.
This course provides the student with various methods of illustrating structures and machine parts. Topics include axonometric drawings; exploded assembly drawings; one point, two point, and three point perspectives;

surface textures; and renderings. Upon completion, students should be able to produce drawings and illustrations using the previously described methods.

DDT 227 STRENGTH OF MATERIALS (4-0-4)
PREREQUISITE: DDT 104, DDT 111, DDT 124.
This course in statics and strength of materials includes the study of forces and how they act and react on bodies and structures. Topics include the effects of forces as found in structures and machines under conditions of equilibrium, how materials resist forces, strengths of common construction materials and structural components. Force systems such as parallel, concurrent, and non-concurrent are studied in co-planar and non-coplanar situations. Upon completion, students should understand and be able to apply the principles of force in engineering drawings.

DDT 231 ADVANCED CAD (1-4-3)
PREREQUISITE: As required by college.
This course allows the student to plan, execute, and present results of individual projects in Advanced CAD topics. Emphasis is placed on enhancing skill attainment in Advanced CAD skill sets. The student will be able to demonstrate and apply competencies identified and agreed upon between the student and instructor.

DDT 232 CAD CUSTOMIZATION (2-4-4)
PREREQUISITE: DDT 104 and DDT 127 or DDT 231 or advisor approval.
This course introduces the various methods of customizing CAD software to meet individual or company needs. Topics include menu customizing, programming, custom command macros, script files, slides, and slide libraries. Upon completion, students should be able to customize and write menus, write programming routines, and write script files for the purpose of increasing the proficiency of the CAD operator.

DDT 233 INTERMEDIATE 3D MODELING (1-4-3)
PREREQUISITE: As required by college.
This course emphasizes the more advanced techniques in 3D solid modeling. It covers advanced features of part creation, part editing, and analysis. Some techniques that will be discussed are: lofting, sweeping, sheet metal part creation, interference checking and stress analysis. Upon completion of the course students should be able to create advanced 3D models and perform stress analysis/interference checking.

DDT 235 SPECIALIZED CAD (1-4-3)
PREREQUISITE: As required by college.
This course allows the student to plan, execute, and present results of individual projects in Specialized CAD topics. Emphasis is placed on enhancing skill attainment in Specialized CAD skill sets. The student will be able to demonstrate and apply competencies identified by the instructor.

DDT 236 DESIGN PROJECTS (1-4-3)
PREREQUISITE: As required by college.
This course allows the student to plan, execute, and present results of an individual design project. Emphasis is placed on attainment of skills related to a project agreed upon by the instructor and student. The student will be able to demonstrate and apply competencies identified and agreed upon between the student and instructor.

DDT 237 CURRENT TOPICS IN CAD (1-4-3)
PREREQUISITE: As required by college.
This course allows the student to plan, execute, and present results of individual projects relating to current topics in CAD. Emphasis is placed on attainment of skills related to changes in current CAD technology. The student will be able to demonstrate and apply competencies identified by the instructor.

DDT 238 SPECIAL TOPICS IN CAD (1-4-3)
PREREQUISITE: As required by college.
This course in special CAD and multimedia topics covers special capabilities possible with CAD software, especially in conjunction with other graphical software, such as virtual "walk-throughs" or multimedia presentations. Topics include but are not limited to combining CAD software, image editing software, authoring software, and 3D software into one harmonious relationship to produce multimedia presentations. Upon completion, students should be aware of and understand how to utilize several software packages to produce multimedia presentations.

DDT 244 ADVANCED 3D MODELING (1-4-3)
PREREQUISITE: As required by college.
This course is designed to challenge the imagination of the student in a three dimensional problem-solving environment using solids modeling software. The student will develop to scale computer generated parts in the 3D computer environment. They will apply modeling concepts as Constraints, Photorealistic rendering, motion activated views, introduction to 3D part libraries, add-in software components, plastic model technology and simulations. They will be introduced to the concepts of 3D design and animation, then apply those concepts to a design project. Upon completion, students should be able to create parts in 3D models, produce working drawing and understand basic simulations. Students will also print files to ".stl" format and create parts on a Direct Digital Manufacturing system or prototype.

DDT 260 PORTFOLIO (1-4-3)
PREREQUISITE: As required by college.
This course includes the preparation of technical and/or architectural drawings for a portfolio presentation and a resume for portfolio presentation. Hard copy drawings as well as electronic will be discussed, finalized and developed for presentation. Upon completion, students should be able to prepare and produce a portfolio for presentation. This course includes the preparation of artwork and a resume for portfolio presentation. Topics include production of a resume and portfolio for presentation during the last semester of course work. Upon completion, students should be able to prepare and produce a resume and portfolio for presentation in both hard copy as well as electronic copy.

## ECONOMICS

ECO 231 PRINCIPLES OF MACROECONOMICS (3-0-3)
This course is an introduction to macroeconomic theory, analysis, and policy applications. Topics include the following: scarcity, demand and supply, national income analysis, major economic theories concerning monetary and fiscal policies as stabilization measures, the banking system, and other economic issues or problems including international trade. CORE

ECO 232 PRINCIPLES OF MICROECONOMICS (3-0-3)
This course is an introduction of the microeconomic theory, analysis, and applications. Topics include scarcity, the theories of consumer behavior, production and cost, markets, output and resource pricing, and international aspects of Microeconomics. CORE

## ELECTRICAL TECHNOLOGY

ELT 110 WIRING METHODS (1-4-3)
This course is a study of various tasks, wiring methods, materials, and associated NEC requirements that students will be required to work with in residential and commercial wiring courses. CORE

ELT 114 RESIDENTIAL WIRING METHODS (2-2-3)
PREREQUISITE: ELT 109 or ETC 102
This course is a study of residential wiring practices and methods, the NEC requirements and residential blueprint interpretations.

ELT 117 AC/DC MACHINES (1-4-3)
This course covers the theory and operation of DC motors, single and three phase AC motors, and the labs will reinforce this knowledge. Emphasis is placed on the various types of single and three phase motors, wiring diagrams, starting devices, and practical application in the lab. CORE

ELT 118 COMMERCIAL/INDUSTRIAL WIRING (1-4-3)
This course focuses on principles and applications of commercial and industrial wiring. Topics include electrical safety practices, an overview of National Electric Code requirements as applied to commercial and industrial wiring, conduit bending, circuit design, pulling cables, transformers, switch gear, and generation principles.

ELT 192 PRACTICUM/INTERNSHIP/CO-OP (0-1-1)
This course provides practical experience in the field early in the student's training as an electrician's helper on the job, working a speical project or conducting research in a directed area of the field. Emphasis is placed on gaining hands on experience with tools of the trade as well as a better understanding of NEC directives. Upon completion, students should possess a higher state of proficiency in the basic skills of connecting electrical wiring and conduit; this course may be repeated with the instructor's permission.

ELT 193 PRACTICUM/INTERNSHIP/CO-OP (0-10-2)
This course provides practical experience in the electrical craft as an electrician's helper on the job, working a special project or conducting research in a directed area of the field. Emphasis is placed on gaining hands on experience with tools of the trade as well as better understanding of NEC directives. Upon completion, students should possess a higher state of proficiency in the basic skills of connecting electrical wiring and conduit; this course may be repeated with the instructor

ELT 194 PRACTICUM/INTERNSHIP/CO-OP (0-15-3)
This course provides additional practical experience in the electrical craft as an apprentice electrician or higher level working advanced projects or research in a directed area of the field. Emphasis is placed on gaining more hands on experience with tools of the trade as wel as NEC directives while studying in the classroom two hours per week. Upon completion, students should possess a higher state of proficiency in all electrician skills and a better knowledge of testing for Electrical Journeyman's Block Test.

ELT 212 MOTOR CONTROL II (2-2-3)
PREREQUISITE: ELT 209 or ETC 108
This course covers complex ladder diagrams of motor control circuits and the uses of different motor starting techniques. Topics include wye-delta starting, part start winding, resistor starting and electronic starting devices.

ELT 221 ELECTRONICS FOR ELECTRICIANS I (2-2-3)
PREREQUISITE: ELT 102
This course introduces the basic principles of solid state electronic equipment as found in many electrical and motor control circuits. Emphasis is placed on fundamental concepts of diodes, transistors, FETs and MOSFETs as they are used in electrical control circuits.

ELT 241 NATIONAL ELECTRIC CODE (3-0-3)
Prerequisite: ELT 209 or ETC 108
This course introduces students to the National Electric Code and text teaches the student how to find needed information within this manual. Emphasis is placed on locating and interpreting needed information within the NEC code manual. This course is also taught as ILT 231.

ELT 244 CONDUIT BENDING AND INSTALLATION (2-2-3)
PREREQUISITE: As required by program.
This course provides students the knowledge to properly bend electrical metallic tubing, rigid galvanized and intermediate metal conduit, and PVC conduit. Emphasis is placed on the theory and practical application of conduit bending methods. Upon completion, students should be able to get measurements, lay out, and successfully bend conduit using hand type, mechanical, and hydraulic benders.

## ELECTROMECHANICAL TECHNOLOGY

ELM 214 PUMPS AND PIPING SYSTEMS (2-1-3)
This course offers an introduction into pumps and piping systems. Topics include various types of pumps, pump analysis, (power, efficiency, characteristics) pump selection and maintenance, metal, plastic, and threaded piping systems, hoses, valves, regulators, strainers, and filters. Upon completion of this course the student will have demonstrated the ability to: select, install, and start up various types of pumps, measure and calculate pump parameters and performance, disassemble and inspect pumps, size and select pipes, thread metal pipes, read and interpret piping schematics, assemble piping systems, select size, and repair valves and regulators.

## ELECTRONICS TECHNOLOGY

ETC 101 DC FUNDAMENTALS (1-4-3)
This course provides a study of atomic theory, direct current (DC), properties of conductors and insulators, direct current characteristics of series, parallel, and series parallel circuits. Inductors and capacitors are introduced and their effects on DC circuits are examined. Students are prepared to analyze complex DC circuits, solve for unknown circuits variables and to use basic electronic test equipment. This course also provides hands-on laboratory exercises to analyze, construct, test, and troubleshoot direct current circuits. Emphasis is placed on the use of scientific calculator and the operation of common test equipment used to analyze and troubleshoot DC and to prove the theories taught during classroom instruction. It is also taught as INT 221, ILT 160, and ELT 108. CORE

ETC 102 AC FUNDAMENTALS (1-4-3)
This course provides a study of the theory of alternating current (AC). Students are prepared to analyze complex AC circuit configurations with resistor, capacitors, and inductors in series and parallel combinations. Upon completion, students should be able to describe AC circuits and explain the function of A.C. such as RLC, impedance, phase relationships and power factor. This course also provides hands-on laboratory exercises to analyze alternating current using a variety of circuit configurations with resistors, capacitors, and inductors in series and parallel combinations. Emphasis is placed on the operation of common test equipment used to analyze and troubleshoot AC circuits to prove the theories taught. It is also taught as INT 223, ILT 161, and ELT 109. CORE

ETC 104 DIGITAL FUNDAMENTALS (1-4-3)
This course provides instruction on basic logic gates, flip-flops, registers, counters, microprocessor/computer fundamentals, analog to digital conversion, and digital analog conversion. Emphasis is placed on number systems, Boolean algebra, combination logic circuits, sequential logic circuits and typical microprocessor data manipulation and storage. This course also has an embedded lab with exercises designed to develop skills required by industry. Upon completion, students should be able to analyze digital circuits, draw timing diagrams, determine output of combinational and sequential logic circuits and diagnose and troubleshoot electronic components as well as demonstrate knowledge of microprocessor and computer circuits. It is also taught as ILT 163. CORE

ETC 107 ELECTRICAL BLUEPRINT READING I (3-0-3)
This course will enable the student to obtain a working knowledge of the elements of blueprint reading; the ability to interpret electrical, mechanical, and architectural drawing; and the ability to visualize the entire building structure in relationship to the electrical system. It is also taught as ILT 109. CORE

ETC 108 MOTOR CONTROLS I (1-4-3)
This course covers the use of motor control symbols, magnetic motor starters, running overload protection, push-button stations, sizing of magnetic motor starters and overload protection, and complex ladder diagrams of motor control circuits. Topics include sizing magnetic starters and starters in control of electric motors, wye-delta starting, part start winding, resistor starting and electric starting devices. Upon completion, students should be able to understand the operation of motor starters, overload protection, interpret ladder diagrams using push-button stations and understand complex motor control diagrams. It is also taught as ELT 209 and ILT 197. CORE

## EMERGENCY MEDICAL TECHNICIAN-PARAMEDIC (EMS)

EMS 100 CARDIOPULMONARY RESUSCITATION I (1-0-1)
This course provides students with concepts as related to areas of basic life support to include coronary artery disease, prudent heart living, symptoms of heart attack, adult one-and-two rescuer CPR, first aid for choking, pediatric basic life support, airway adjuncts, EMS system entry access, automated external defibrillation (AED), and special situations for CPR. Upon course completion, students should be able to identify situations requiring action related to heart or breathing conditions and effectively implement appropriate management for each condition. Students successfully completing this course will receive appropriate documentation of course completion.

EMS 101 CARDIOPULMONARY RESUSCITATION II (1-0-1)
PREREQUISITE: As required by program.
This course provides students with a review of concepts learned in EMS 100. In addition, the course provides the student with theory and application of airway adjuncts as utilized with airway obstruction and maintenance as well as respiratory and cardiac arrest. Assessment and management of acute ischemic stroke will also be included. Upon course completion, students should be able to identify situations requiring action related to heart or breathing conditions and effectively implement appropriate management for these conditions. Students successfully completing this course will receive appropriate documentation of course completion.

EMS 103 FIRST AID-CPR and AED (1-0-1)
PREREQUISITE: Current training in CPR or advisor approval.
This course introduces students to initial first aid care. Topics include scene safety, universal precautions, activation of the EMS system, assessment, airway/breathing/circulation, shock/injuries/ bleeding, medical emergencies, and altered level of consciousness. Upon course completion, students should have knowledge to manage various emergencies requiring first aid techniques.

EMS 118 EMERGENCY MEDICAL TECHNICIAN (6-3-9)
PREREQUISITE: As required by program.
This course is required to apply for certification as an Emergency Medical Technician. This course provides students with insights into the theory and application of concepts related to the profession of emergency medical services. Specific topics include: EMS preparatory, airway maintenance, patient assessment, management of trauma patients, management of medical patients, treating infants and children, and various EMS operations. This course is based on the NHTSA National Emergency Medical Services Education Standards.

EMS 119 EMERGENCY MEDICAL TECHNICIAN CLINICAL (0-3-1)
PREREQUISITE: As required by program.
This course is required to apply for certification as an EMT. This course provides students with clinical education experiences to enhance knowledge and skills learned in the EMS 118, Emergency Medical Technician Theory and Lab. This course helps students prepare for the National Registry Exam.

EMS 155 ADVANCED EMERGENCY MEDICAL TECHNICIAN (5-6-8)
PREREQUISITE: As required by program.
COREQUISITE: EMS 156
This course is required to apply for certification as an Advanced Emergency Medical Technician (AEMT). This course introduces the theory and application of concepts related to the profession of the AEMT. The primary focus of the AEMT is to provide basic and limited advanced emergency medical care and transportation for critical and emergent patients who access the emergency medical system. This individual possesses the basic knowledge and skills necessary to provide patient care and transportation. Topics include: extending the knowledge of the EMT to a more complex breadth and depth, intravenous access and fluid therapy, medication administration, blind insertion airway devices, as well as the advanced assessment and management of various medical illnesses and traumatic injuries. This course is based on the NHTSA National Emergency Medical Services Education Standards. Requires licensure or eligibility for licensure at the EMT level and EMS 156 must be taken as a co-requisite.

EMS 156 ADVANCED EMERGENCY MEDICAL TECHNICIAN CLINICAL (0-6-2)
PREREQUISITE: As required by program.
COREQUISITE: EMS 155
This course is required to apply for certification as an Advanced Emergency Medical Technician (AEMT). This course provides students with clinical education experiences to enhance knowledge and skills learned in EMS 155. This course helps prepare students for the National Registry AEMT Exam. The student will have the opportunity to use the basic and advanced skills of the AEMT in the clinical and field settings under the direct supervision of licensed healthcare professionals. Requires licensure or eligibility for licensure at the EMT level and EMS 155 must be taken as a co-requisite.

EMS 240 PARAMEDIC OPERATIONS (1-2-2)
PREREQUISITE: EMS 189 or BIO 201. As required by program.
This course focuses on the operational knowledge and skills needed for safe and effective patient care within the paramedic's scope of practice. Content areas include: research, paramedic roles and responsibilities, well-being of the paramedic, illness and injury prevention, medical-legal-ethical issues, therapeutic communications, medical terminology, life span development, ambulance operations, medical incident command, rescue awareness and operations, hazardous materials incidents, crime scene awareness, and Alabama EMS laws and rules.

EMS 241 PARAMEDIC CARDIOLOGY (2-2-3)
PREREQUISITE: EMS 189 or BIO 201. As required by program.
This course introduces the cardiovascular system, cardiovascular electrophysiology, and electrocardiographic monitoring. This course further relates pathophysiology and assessment findings to the formulation of field impressions and implementation of treatment plans for specific cardiovascular conditions. Content areas include: cardiovascular anatomy and physiology, cardiovascular electrophysiology, electrocardiographic monitoring, rhythm analysis, and prehospital 12-lead electrocardiogram monitoring and interpretation, assessment of the cardiovascular patient, pathophysiology of cardiovascular disease and techniques of management including appropriate pharmacologic agents and electrical therapy.

EMS 242 PARAMEDIC PATIENT ASSESSMENT (2-2-3)
PREREQUISITE: EMS 189 or BIO 201. As required by program.
This course provides the knowledge and skills needed to perform a comprehensive patient assessment, make initial management decisions, and to communicate assessment findings and patient care verbally and in writing. Content areas include: airway management, history taking, techniques of the physical examination, patient assessment, clinical decision making, communications, documentation and assessment based management.

EMS 243 PARAMEDIC PHARMACOLOGY (0-2-1)
PREREQUISITE: EMS 189 or BIO 201. As required by program.
This course introduces basic pharmacological agents and concepts with an emphasis on drug classifications and the knowledge and skills required of a paramedic for safe, effective medication administration. Content areas include: general principles of pharmacology and pharmacologic pathophysiology; venous and intraosseous access techniques, the metric and apothecary system; computation of dosage and solution problems, administration of pharmacologic agents; pharmacokinetics and pharmacodynamics, and nasogastric tube placement.

EMS 244 PARAMEDIC CLINICAL I (0-3-1)
PREREQUISITE: EMS 189 or BIO 201. As required by program.
This course is directed toward the application of knowledge and skills developed in didactic and skills laboratory experiences to the clinical setting. Theory and skills are applied to a variety of patient situations in the clinical setting, with a focus on patient assessment and management, advanced airway management, electro-therapy, I.V./I.O. initiation and medication administration.

EMS 245 PARAMEDIC MEDICAL EMERGENCIES (2-2-3)
PREREQUISITE: As required by program.
This course relates pathophysiology and assessment findings to the formulation of field impressions and implementation treatment plans for specific medical conditions. Content areas include: pulmonology, neurology, gastroenterology, renal/urology, toxicology, hematology, environmental conditions, infectious and communicable diseases, abuse and assault, patients with special challenges, and acute interventions for the chronic care patient.

EMS 246 PARAMEDIC TRAUMA MANAGEMENT (2-2-3)
PREREQUISITE: As required by program.
This course relates pathophysiology and assessment findings to the formulation of field impressions and implementation of treatment plans for trauma patients. Content areas include the pathophysiology, assessment, and management of trauma as related to: trauma systems; mechanisms of injury; hemorrhage and shock; soft tissue injuries; burns; and head, facial, spinal, thoracic, abdominal, and musculoskeletal trauma.

EMS 247 PARAMEDIC SPECIAL POPULATIONS (1-2-2)
PREREQUISITE: As required by program.
This course relates pathophysiology and assessment findings to the formulation of field impressions and implementation of treatment plans for specific medical conditions. Content areas include: endocrinology, allergies and anaphylaxis, behavioral/psychiatric conditions, gynecology, obstetrics, neonatology, pediatrics, and geriatrics. In the clinical setting, theory and skills are applied to a variety of medical situations across the life span of the patient, with a focus on communication with and management of cardiac, acute care, psychiatric/behavioral, obstetrical, newborn, pediatric, geriatric, and acute interventions for chronic care patients, and patients with special challenges.

EMS 248 PARAMEDIC CLINICAL II (0-9-3)
PREREQUISITE: As required by program.
This course is required to apply for certification as a Paramedic. This course provides students with clinical education experiences to enhance knowledge and skills learned in EMS 245, 246, and 247 and knowledge and proficiency from previous clinical experiences. This course helps prepare students for the National Registry Paramedic Exam. The student will have the opportunity to use the basic and advanced skills of the Paramedic in the clinical setting under the direct supervision of licensed healthcare professionals. Requires licensure at the AEMT level.

EMS 253 PARAMEDIC TRANSITION TO THE WORKFORCE (1-2-2)
PREREQUISITE: As required by program.
PRE/COREQUISITE: MTH 100 and ENG 101.
This course is designed to meet additional state and local educational requirements for paramedic practice. Content includes: ACLS, PALS or PEPP, ITLS or PHTLS, pre-hospital protocols, transfer drugs, and other courses as dictated by local needs or state requirements.

EMS 254 ADVANCED COMPETENCIES FOR THE PARAMEDIC (1-2-2)
PREREQUISITE: As required by program.
PRE/COREQUISITE: MTH 100 and ENG 101.
This course is designed to assist students in preparation for the paramedic licensure examination. Emphasis is placed on validation of knowledge and skills through didactic review, skills lab performance, and/or computer simulation and practice testing. Upon course completion, students should be sufficiently prepared to sit for the paramedic licensure examination.

EMS 255 PARAMEDIC FIELD PRECEPTORSHIP (0-15-5)
PREREQUISITE: Licensure at the AEMT level and completion of EMS 240, 241, 242, 243, 244, 245, 246, 247, and 248
PRE/COREQUISITE: MTH 100 and ENG 101
This course is required to apply for certification as a paramedic. This course provides students with field experiences to enhance knowledge and skills learned throughout the paramedic program. This course helps prepare students for the National Registry Paramedic Exam. Students will utilize paramedic skills in a field setting under the direct supervision of a licensed paramedic.

EMS 256 PARAMEDIC TEAM LEADERSHIP (0-2-1)
PREREQUISITE: As required by program.
PRE/COREQUISITE: MTH 100 and ENG 101.
This course is designed to evaluate students' ability to integrate didactic, psychomotor skills, clinical, and field internship instruction to serve as a competent entry-level paramedic. This final evaluative (rather than instructional) course focuses on students' professional attributes and integrative competence in clinical decision-making and team leadership in the prehospital setting. Upon course completion, students should have demonstrated adequate knowledge and skills, professional attitudes and attributes, clinical decision-making and team leadership abilities to effectively function as a competent entry-level paramedic.

## ENGINEERING

EGR 101 ENGINEERING FOUNDATIONS (2-2-3)
COREQUISITE: MTH 113 or MTH 115.
This course introduces the student to engineering as a profession, basic engineering skills and the design process. This course includes components to develop team and oral and written communication skills. It also provides an introduction to computer tools used by engineers (spreadsheet, word processing, presentation software, internet access).

EGR 125 MODERN GRAPHICS FOR ENGINEERS (1-4-3)
This course provides an introduction to manual and computer-assisted techniques of graphic communication employed by professional engineers. Topics include: lettering; instrumental and computer-aided drafting; technical sketching; orthographic projection; pictorial, sectional, and auxiliary views; and dimensioning.

EGR 157 COMPUTER METHODS FOR EGR USING MATLAB (2-2-3)
PREREQUISITE: MTH 125
This course introduces students to the concepts and practices in using higher level computer environments to solve engineering problems. Programming environments such as MATLAB will be used.

EGR 220 ENGINEERING MECHANICS - STATICS (3-0-3)
PREREQUISITE: PHY 213
COREQUISITE: MTH 227
This course includes vector algebra, force and moment systems, equilibrium of force systems, trusses, friction and property of surfaces.

## ENGLISH

COM 100 INTRODUCTORY TECHNICAL ENGLISH I (3-0-3)
PREREQUISITE: A grade of "S" in ENG 092 or appropriate placement score.
This course is designed to enhance reading and writing skills for the workplace. Emphasis is placed on technical reading, job-related vocabulary, sentence writing, punctuation, and spelling with substantial focus on occupational performance requirements. Upon completion, students should be able to identify main ideas with supporting details and produce mechanically correct short writings appropriate to the workplace.

ENG 080 ENGLISH LABORATORY (1-0-1)
This course, which may be repeated as needed, provides students with a laboratory environment where they can receive help from qualified instructors on English assignments at the developmental level. Emphasis is placed on one-to-one guidance to supplement instruction in English courses. A student's success in this course is measured by success in those other English courses in which the student is enrolled.

ENG 092 BASIC ENGLISH I (3-0-3)
This course is a review of basic writing skills and basic grammar. Emphasis is placed on the composing process of sentences and paragraphs in standard American written English. Students will demonstrate these skills chiefly through the writing of well-developed, multi-sentence paragraphs.

ENG 093 BASIC ENGLISH II (3-0-3)
PREREQUISITE: A grade of "S" (Satisfactory) in ENG 092 or appropriate placement score.
This course is a review of composition skills and grammar. Emphasis is placed on coherence and the use of a variety of sentence structures in the composing process and on standard American written English usage. Students will demonstrate these skills chiefly through the writing of paragraph blocks and short essays.

ENG 101 ENGLISH COMPOSITION I (3-0-3)
PREREQUISITE: Successful completion of ENG 093 with a "C" or appropriate placement score; or a score of 20 or better on the English and math sections of the ACT (or equivalent SAT score).
English Composition I provides instruction and practice in the writing of at least six (6) extended compositions and the development of analytical and critical reading skills and basic reference and documentation skills in the composition process. English Composition I includes instruction and practice in library usage. CORE

ENG 102 ENGLISH COMPOSITION II (3-0-3)
PREREQUISITE: A grade of "C" or higher in ENG 101.
English Composition II provides instruction and practice in the writing of six (6) formal, analytical essays, at least one of which is a research project using outside sources and/or references effectively and legally. Additionally, English Composition II provides instruction in the development of analytical and critical reading skills in the composition process. English Composition II includes instruction and practice in library usage. CORE

ENG 246/247 CREATIVE WRITING I & II (3-0-3)
PREREQUISITE: ENG 102 and/or as required by program.
This course provides instruction and practice in the writing of critical analysis of imaginative forms of literature. Emphasis is placed on originality in the creative writing process, and this course may include instruction on publishing. Students will compose a significant body of imaginative literature, which may be read by or to the class.

ENG 251 AMERICAN LITERATURE I (3-0-3)
PREREQUISITE: ENG 102 or equivalent.
This course is a survey of American literature from its inception to the middle of the nineteenth century. Emphasis is placed on representative works and writers of this period and on the literary, cultural, historical, and philosophical forces that shaped these works and that are reflected in them. On examinations and in written compositions, students will interpret the aesthetic and thematic aspects of these works, relate the works to their historical and literary contexts, and understand relevant criticism and research. CORE
ENG 252 AMERICAN LITERATURE II (3-0-3)
PREREQUISITE: ENG 102 or equivalent.
This course is a survey of American literature from the middle of the nineteenth century to the present. Emphasis is placed on representative works and writers of this period and on the literary, cultural, historical, and philosophical forces that shaped these works and that are reflected in them. On examinations and in written compositions, students will interpret the aesthetic and thematic aspects of these works, relate the works to their historical and literary contexts, and understand relevant criticism and research. CORE

ENG 261 ENGLISH LITERATURE I (3-0-3)
PREREQUISITE: ENG 102 or equivalent.
This course is a survey of English literature from the Anglo-Saxon period to the Romantic Age. Emphasis is placed on representative works and writers of this period and on the literary, cultural, historical, and philosophical forces that shaped these works and that are reflected in them. On examinations and in written compositions, students will interpret the aesthetic and thematic

aspects of these works, relate the works to their historical and literary contexts, and understand relevant criticism and research. CORE

ENG 262 ENGLISH LITERATURE II (3-0-3)
PREREQUISITE: ENG 102 or equivalent.
This course is a survey of English literature from the Romantic Age to the present. Emphasis is placed on representative works and writers of this period and on the literary, cultural, historical, and philosophical forces that shaped these works and that are reflected in them. On examinations and in written compositions, students will interpret the aesthetic and thematic aspects of these works, relate the works to their historical and literary contexts, and understand relevant criticism and research. CORE

ENG 271 WORLD LITERATURE I (3-0-3)
PREREQUISITE: ENG 102 or equivalent.
This course is a study of selected literary masterpieces from Homer to the Renaissance. Emphasis is placed on major representative works and writers of this period and on the literary, cultural, historical, and philosophical forces that shaped these works and that are reflected in them. On examinations and in written compositions, students will interpret the aesthetic and thematic aspects of these works, relate the works to their historical and literary contexts, and understand relevant criticism and research. CORE

ENG 272 WORLD LITERATURE II (3-0-3)
PREREQUISITE: ENG 102 or equivalent.
This course is a study of selected literary masterpieces from the Renaissance to the present. Emphasis is placed on major representative works and writers of this period and on the literary, cultural, historical, and philosophical forces that shaped these works and that are reflected in them. On examinations and in written compositions, students will interpret the aesthetic and thematic aspects of these works, relate the works to their historical and literary contexts, and understand relevant criticism and research. CORE

## GEOGRAPHY

GEO 100 WORLD REGIONAL GEOGRAPHY (3-0-3)
This course surveys various countries and major regions of the world with respect to location and landscape, world importance, political status, population, type of economy, and its external and internal organization problems and potentials. CORE

## GEOLOGY

GLY 101 INTRODUCTION TO GEOLOGY I (3-2-4)
This course is the first in a two part sequence dealing with the structure of the Earth including materials, internal and external processes, deformation, energy, and plate tectonics. Laboratory is required. CORE

GLY 102 INTRODUCTION TO GEOLOGY II (3-2-4)
This course is the second in a two part sequence dealing with a historical perspective of the earth. Topics include items such as Geologic time, Earth's origin, evolution of continents and ocean basins, minerals, energy resources, planetary geology, and mountain building. Laboratory is required. CORE

## HEALTH EDUCATION

HED 199 ECOLOGICAL APPROACH TO HEALTH FITNESS (3-0-3)
This course examines a myriad of factors influencing health and fitness behavior. Intrapersonal, interpersonal, institutional, community and public policy factors are examined.

HED 221 PERSONAL HEALTH (3-0-3)
This course introduces principles and practices of personal and family health; it includes human reproduction, growth and development, psychological dimensions of health, human sexuality, nutrition and fitness, aging, death and dying.

HED 222 COMMUNITY HEALTH (3-0-3)
This course introduces principles and practices of community health; it includes drug use and abuse, communicable diseases, cardiovascular diseases, cancer, consumer health, health organization, and environmental concerns.

HED 224 PERSONAL AND COMMUNITY HEALTH (3-0-3)
This course covers health problems for the individual and for the community. Areas of study include mental health, family life, physical health, chronic and degenerative diseases, control of communicable diseases, and the understanding of depressants and stimulants. Healthful living habits will be emphasized.

HED 226 WELLNESS (1-3–0–1-3)
This course provides health-related education to those individuals seeking advancement in the area of personal wellness. The course has five major components: (1) fitness and health assessment, (2) physical work capacity, (3) education, (4) reassessment and (5) retesting.

HED 230 SAFETY AND FIRST AID (3-0-3)
This course is divided into two parts. The first part concerns itself with the development of a safety education program within an organization (i.e., school, office, shop, etc.). The second part deals with physical injuries, emergency care, and treatment of those injuries. CPR certification and Standard Red Cross cards are given upon successful completion of American Red Cross requirements.

HED 231 FIRST AID (3-0-3)
This course provides instruction to the immediate, temporary care which should be given to the victims of accidents and sudden illness. It also includes standard and advanced requirements of the American Red Cross, and/or the American Heart Association. CPR training also is included.

## HISTORY

HIS 101 WESTERN CIVILIZATION I (3-0-3)
This course is a survey of social, intellectual, economic, and political developments, which have molded the modern western world. This course covers the ancient and medieval periods and concludes in the era of the Renaissance and Reformation. CORE

HIS 102 WESTERN CIVILIZATION II (3-0-3)
This course is a continuation of HIS 101; it surveys development of the modern western world from the era of the Renaissance and Reformation to the present. CORE

HIS 121 WORLD HISTORY I (3-0-3)
This course surveys social, intellectual, economic, and political developments which have molded the modern world. Focus is on both non-western and western civilizations from the prehistoric to the early modern era. CORE

HIS 122 WORLD HISTORY II (3-0-3)
This course is a continuation of HIS 121; it covers world history, both western and non-western, from the early modern era to the present. CORE

HIS 201 UNITED STATES HISTORY I (3-0-3)
This course surveys United States history during colonial, Revolutionary, early national and antebellum periods. It concludes with the Civil War and Reconstruction. CORE

HIS 202 UNITED STATES HISTORY II (3-0-3)
This course is a continuation of HIS 201; it surveys United States history from the Reconstruction era to the present. CORE
HIS 216 HISTORY OF WORLD RELIGIONS (3-0-3)
This course presents a comparison of the major religions of the world from a historical perspective. Emphasis is placed on the origin, development, and social influence of Christianity, Judaism, Islam, Hinduism, Buddhism, and others.
HIS 256 AFRICAN-AMERICAN HISTORY (3-0-3)
This course focuses on the experience of African-American people in the western hemisphere, particularly the United States. It surveys the period from the African origins of the slave trade during the period of exploration and colonization to the present. The course presents a comparison between the African experience in the United States and in Mexico and South America.

HIS 260 ALABAMA HISTORY (3-0-3)
This course surveys the development of the state of Alabama from pre-historic times to the present. The course presents material on the discovery, exploration, colonization, territorial period, antebellum Alabama, Reconstruction, and modern history.

## HOME ECONOMICS

HEC 140 PRINCIPLES OF NUTRITION (3-0-3)
This course introduces students to the principles of nutrition and the role and

functions of nutrients in man's food. Basic information concerning food selection and nutrition as a factor in health, ecology, and economy is included. Implications of nutrition for children may be stressed.

## HUMANITIES

HUM 101 INTRODUCTION TO HUMANITIES I (3-0-3)
This is the first course in a two-semester sequence which offers the student an introduction to the humanities using selections from art, music, literature, history, and philosophy which relates to a unifying theme. CORE

HUM 120 INTERNATIONAL STUDIES IN
(ADD NAME OF COUNTRY) (1-3–0–1-3)
This course offers a survey of art, music, and culture of foreign countries. This may involve travel abroad and may be repeated for credit.

HUM 299 PHI THETA KAPPA HONORS COURSE III (1-0-1)
This course provides an opportunity for the student to study selected topics in the area of the humanities under the supervision of a qualified instructor. The specific topics will be determined by the interests of the students and faculty and the course may be repeated for credit.

## INDUSTRIAL ELECTRONICS TECHNICIAN

ILT 103 INTRODUCTION TO INSTRUMENTATION TECHNOLOGY (1-4-3)
This course introduces various hand and power tools, basic blueprint reading, basic rigging and basic math that will be used in the electronic, instrumentation and electrical trades. Emphasis is placed on basic hand tool and power tool safety and procedures for selecting, inspecting, using and maintaining these tools. Upon completion, students should be able to identify and use various hand and power tools, read a blueprint and know how to perform basic rigging.

ILT 108 INTRODUCTION TO INSTRUMENTS AND
PROCESS CONTROL (2-2-3)
This course is an introductory study of the control devices and methods used in industry for the control and transmission of information pertaining to process variables. This study includes an introduction to instrumentation and control mathematics. This course also provides instruction in the fundamental concepts of pressure, force, weight, motion, liquid level, fluid flow and temperature.

ILT 110 ADVANCED INDUSTRIAL PROCESS CONTROL
TECHNOLOGY (2-2-3)
This course is an advanced study of the principes governing methods of using process variables in the control of industrial processes. The study includes methods and procedures for measuring, displaying and transmitting process variables according to industry standards. The course also includes an in-depth study of mathematics pertaining to industrial control instruments.

ILT 114 INSTRUMENTATION OPERATION AND CALIBRATION (2-2-3)
The hardware used to measure and control process variables is presented. The student learns the principles of operation, servicing, maintenance, calibration, and troubleshooting procedures used on mechanical, pneumatic, electronic and digital based industrial transmitters, recorders, controllers, valves, and other control devices. The course is broken down into theory and laboratory work on actual process measuring and control equipment.

ILT 135 LOCAL AREA NETWORKS (LANS) (2-2-3)
This course provides the student with knowledge of planning, installation, maintenance, and administration of local area networks. Upon completion of this course, students should be able to install and setup a basic local area network.

ILT 139 INTRODUCTION TO ROBOTIC PROGRAMMING (1-4-3)
This course provides an introduction to robotic programming. Emphasis is placed on, but not limited to, the following: safety, motion programming, creating and editing programs, I/O instructions, macros, program and file storage Upon completion, the student will be able to safely perform basic functions in the work cell as well as program a robot to perform simple functions.

ILT 165 INDUSTRIAL ELECTRONIC CONTROLS I (2-2-3)
This course provides a study of industrial electronics controls. Topics include photo-electric, temperature, gas and humidity, pressure and strain measurements for industrial instrumentation controls and applications. The lab enables students to test, troubleshoot and repair electronic control circuits. Upon completion, students should be able to apply principles of industrial electronics control circuits.

ILT 195 TROUBLESHOOTING TECHNIQUES (2-2-3)
This course focuses on the systematic approach to solving problems. Emphasis is placed on instrument failures and their interaction with process downtime. Upon completion, students will be able to solve problems on a process simulator or in an actual setting.

ILT 196 ADVANCED PROGRAMMABLE LOGIC CONTROLLERS (2-2-3)
PREREQUISITE: As determined by College
This course includes the advanced principals of PLC's including hardware, programming, and troubleshooting. Emphasis is placed on developing advanced working programs and troubleshooting hardware and software communication problems. Upon completion, students should be able to demonstrate their ability in developing programs and troubleshooting the system.

ILT 214 CONTROL AND TROUBLESHOOTING FLOW, LEVEL,
TEMPERATURE, PRESSURE AND LEVEL PROCESSES (2-2-3)
The student is introduced to analog and digital process control systems. The student is also introduced to process control techniques commonly found in industrial processes used to maintain control of process variables. The student gains knowledge and experience in the design and selection of equipment used in troubleshooting of control loops on actual lab equipment.

ILT 235 PRINCIPLES OF ROBOTIC SYSTEMS (3-0-3)
This course is an overview of basic robotic systems and classifications used in industry. An emphasis is placed on safety elements particular to automation. Topics include the principles and concepts associated with robotic system components. Upon completing this course, students should be able to classify robots and explain the various components of a safe robotic system and how these components interact.

## INDUSTRIAL MAINTENANCE TECHNOLOGY

INT 117 PRINCIPLES OF INDUSTRIAL MECHANICS (2-2-3)
This course provides instruction in basic physics concepts applicable to mechanics of industrial production equipment. Topics include the basic application of mechanical principles with emphasis on power transmission, specific mechanical components, alignment, and tension. Upon completion, students will be able to perform basic troubleshooting, repair and maintenance functions on industrial production equipment.

INT 118 FUNDAMENTALS OF INDUSTRIAL HYDRAULICS AND
PNEUMATICS (2-2-3)
This course includes the fundamental concepts and theories for the safe operation of hydraulic and pneumatic systems used with industrial production equipment. Topics include the physical concepts, theories, laws, air flow characteristics, actuators, valves, accumulators, symbols, circuitry, filters, servicing safety, and preventive maintenance functions on hydraulic and pneumatic systems. CORE

INT 126 PREVENTIVE MAINTENANCE (1-4-3)
This course focuses on the concepts and applications of preventive maintenance. Topics include the introduction of alignment equipment, job safety, tool safety, preventive maintenance concepts, procedures, tasks, and predictive maintenance concepts. Upon course completion, students will demonstrate the ability to apply proper preventive maintenance and explain predictive maintenance concepts. CORE

INT 134 PRINCIPLES OF INDUSTRIAL MAINTENANCE WELDING AND
METAL CUTTING TECHNIQUES (2-2-3)
This course provides instruction in the fundamentals of acetylene cutting and the basics of welding needed for the maintenance and repair of industrial production equipment. Topics include oxy-fuel safety, choice of cutting equipment, proper cutting angles, equipment setup, cutting plate and pipe, hand tools, types of metal welding machines, rod and welding joints, and common welding passes and beads. Upon course completion, students will demonstrate the ability to perform metal welding and cutting techniques necessary for repairing and maintaining industrial equipment. CORE

INT 184 INTRODUCTION TO PROGRAMMABLE LOGIC
CONTROLLERS (2-2-3)
This course provides an introduction to programmable logic controllers.

Emphasis is placed on, but not limited to, the following: PLC hardware and software, numbering systems, installation, and programming. Upon completion, students must demonstrate their ability by developing, loading, debugging, and optimizing PLC programs.

## INTERDISCIPLINARY STUDIES

IDS 115 FORUM (1-0-1)
In this course, credit is given in recognition of attendance at academic lectures, concerts, and other events. IDS 115 requires attendance at designated events which are chosen from various lectures, cultural events and programs given at the college or in the community. IDS 115 may be repeated for credit.

IDS 200 COLLEGE SCHOLARS BOWL WORKSHOP (1-0-1)
PREREQUISITE: Advisor approval.
This course offers the student preparation, practice, and participation in the College Scholars Bowl Program and competition. IDS 200 may be repeated for credit.

IDS 201 ADVANCED SCHOLAR'S BOWL (3-0-3)
This course is designed primarily to train students for Scholars' Bowl competition, alternately known as Brain Bowl, College Bowl or Quiz Bowl. This is an intercollegiate academic competition in which teams of four people compete by using buzzers and answering college-level questions for points. The course consists of practice rounds in which the students are familiarized with the equipment and questions that will be used in competition, as well as intensive study sessions and interactive discussions about a wide variety of academic endeavors. IDS 201 may be repeated for credit.

IDS 286 GENEALOGY AND HISTORY (3-0-3)
The emphasis in this course is upon family history in relation to major U.S. historical events and the use of primary records in documentation. The course is designed for the student who has little or no working knowledge of genealogy as it relates to history.

IDS 299 DIRECTED STUDIES IN LEADERSHIP (1-2–0–1-2)
PREREQUISITE: As required by program.
This course provides training and experience in leadership techniques and practice. Students are required to serve in leadership positions on campus or in the community. IDS 299 may be repeated for credit.

## MACHINE TOOL TECHNOLOGY

MTT 100 MACHINING TECHNOLOGY I (2-8-6)
This course introduces machining operations as they relate to the metalworking industry. Topics include machine shop safety, measuring tools, lathes, saws, milling machines, grinding machines, and layout instruments. Upon completion, students will be able to perform the basic operations of measuring, layout, grinding, drilling, sawing, turning, and milling. This course is aligned with NIMS certification standards. MTT 147/148 are suitable substitutes for this course. CORE

MTT 103 MACHINING TECHNOLOGY II (2-8-6)
This course provides additional instruction and practice in the use of measuring tools, lathes, milling machines, and grinders. Emphasis is placed on set-up and operation of machine tools including the selection of work holding devices, speeds, feeds, cutting tools and coolants. Upon completion, students should be able to perform intermediate level procedures of precision grinding, measuring, layout, drilling, sawing, turning and milling. This course is aligned with NIMS certification standards. MTT 149/150 are suitable substitutes for MTT 103. CORE

MTT 107 MACHINING CALCULATIONS (3-0-3)
This course introduces basic calculations as they relate to machining occupations. Emphasis is placed on basic calculations and their applications in the machine shop. Upon completion, students should be able to perform basic shop calculations. This course is aligned with NIMS certification standards.

MTT 109 ORIENTATION TO COMPUTER ASSISTED MANUFACTURING (3-0-3)
This course serves as an overview and introduction to computer assisted manufacturing (CAM) and prepares students for more advanced CAM courses. Topics covered are basic concepts and terminology, CAM software environments, navigation commands and file management, 2-D geometry, construction modification, and toolpath generation for CAM machining processes.

MTT 121 BASIC PRINT READING FOR MACHINISTS (3-0-3)
This course covers the basic principles of print reading and sketching. Topics include multi-view drawings; interpretation of conventional lines; and dimensions, notes, and thread notations. Upon completion, students should be able to interpret basic drawings, visualize parts, and make pictorial sketches. This is a core course and is aligned with NIMS certification standards. This course is also taught as CNC 121. CORE

MTT 123 ENGINE LATHE LAB I (0-6-3)
The student learns to safely operate an engine lathe in calculating feeds and speeds and shaping a variety of cutting tools by grinding. The student will also safely operate an engine lathe in straight turning, facing, turning to the shoulder and tapers. This is an additional lab for MTT 100.

MTT 124 ENGINE LATHE LAB II (0-6-3)
The student learns advanced operation of an engine lathe in calculating feeds and speeds and shaping a variety of cutting tools by grinding. The student will also safely operate an engine lathe in advanced straight turning, facing, turning to the shoulder and tapers. This is an additional lab for MTT 103.

MTT 127 METROLOGY (2-2-3)
This course covers the use of precision measuring instruments. Emphasis is placed on the inspection of machine parts and use of a wide variety of measuring instruments. Upon completion students should be able to demonstrate correct use of measuring instruments. This course is aligned with NIMS certification standards. CORE

MTT 128 GEOMETRIC DIMENSIONING ABD TOLERANCING (3-0-3)
This course is designed to teach students how to interpret engineering drawings using modern conventions, symbols, datums, datum targets, and projected tolerance zones. Special emphasis is placed upon print reading skills, and industry specifications and standards. This course is aligned with NIMS certification standards.

MTT 129 LATHE OPERATIONS (2-8-6)
This course includes more advanced lathe practices such as set-up procedures, work planning, inner- and outer-diameter operations, and inspection and process improvement. Additional emphasis is placed on safety procedures. Upon completion, students will be able to apply advanced lathe techniques. This course is aligned with NIMS standards.

MTT 130 MACHINING CALCULATIONS II (3-0-3)
This course emphasizes advanced calculations common to machining operations. Students use these calculations for advanced applications for machine setup and planning. Specific topics include positive and negative numbers, symbolism, and algebraic expressions and operations. At the conclusion of this course students will be able to apply advanced machine calculations to equipment setup and planning.

MTT 135 LATHE OPERATIONS I LAB (0-6-3)
This course includes more advanced lathe practices such as set-up procedures, work planning, inner- and outer-diameter operations, and inspection and process improvement. Additional emphasis is placed on safety procedures. Upon completion, students will be able to apply advanced lathe techniques. This course is aligned with NIMS standards.

MTT 136 MILLING OPERATIONS (2-8-6)
This course covers manual milling operations. Emphasis is placed on related safety, types of milling machines and their uses, cutting speed, feed calculations, and set-up and operation procedures. Upon completion, students should be able to apply manual milling techniques (vertical and horizontal/universal) to produce machine tool projects. MTT 137/138 are suitable substitutes for this course. This course is aligned with NIMS certification standards.

MTT 137 MILLING I (2-2-3)
This course covers manual milling operations. Emphasis is placed on related safety, types of milling machines and their uses, cutting speed, feed calculations, and set-up and operation procedures. Upon completion, students should be able to apply manual vertical milling techniques to produce machine tool projects. MTT 137/138 are suitable to substitute for MTT 136. This course is aligned with NIMS certification standards.

MTT 138 MILLING I LAB (0-6-3)
This course provides basic knowledge of milling machines. Emphasis is placed

on types of milling machines and their uses, cutting speed, feed calculations, and set-up procedures. Upon completion, students should be able to apply milling techniques to produce machine tool projects. MTT 137/138 are suitable substitutes for MTT 136. This course is aligned with NIMS certification standards.

MTT 139 BASIC COMPUTER NUMERICAL CONTROL (2-2-3)
This course introduces the concepts and capabilities of computer numeric control (CNC) machine tools. Topics include setup, operation, and basic applications. Upon completion, students should be able to develop a basic CNC program to safely operate a lathe and milling machine. This course is aligned with NIMS certification standards. This course is also taught as CNC 139.

MTT 140 BASIC COMPUTER NUMERICAL CONTROL
TURNING PROGRAMMING I (1-4-3)
This course covers concepts associated with basic programming of a computer numerical control (CNC) turning center. Topics include basic programming characteristics, motion types, tooling, workholding devices, setup documentation, tool compensations, and formatting. Upon completion, students should be able to write a basic CNC turning program that will be used to produce a part. This course is aligned with NIMS certification standards.

MTT 141 BASIC COMPUTER NUMERIC CONTROL
MILLING PROGRAMMING I (1-4-3)
This course covers concepts associated with basic programming of a computer numerical control (CNC) milling center. Topics include basic programming characteristics, motion types, tooling, workholding devices, setup documentation, tool compensations, and formatting. Upon completion, students should be able to write a basic CNC milling program that will be used to produce a part. This course is aligned with NIMS certification standards.

MTT 142 ADVANCED MACHINING CALCULATIONS (2-2-3)
This course combines mathematical functions with practical machine shop applications and problems. Emphasis is placed on gear ratios, lead screws, indexing problems, and their applications in the machine shop. Upon completion, students should be able to calculate solutions to machining problems.

MTT 144 ELECTRICAL DISCHARGE MACHINING I (1-4-3)
This course introduces the student to the concepts of Electrical Discharge Machining (EDM) and the importance of EDM is an industrial setting. Emphasis is placed on safety procedures and machinist responsibility in the setup and operation of EDM machines and electrode selection. Upon completion, students should be able to produce basic machine products using both the wire-type and plunge-type EDM machines. This course is aligned with NIMS certification standards.

MTT 147 INTRODUCTION TO MACHINE SHOP I (2-2-3)
This course introduces machining operations as they relate to the metalworking industry. Topics include machine shop safety, measuring tools, lathes, saws, milling machines, bench grinders, and layout instruments. Upon completion, students will be able to perform the basic operations of measuring, layout, drilling, sawing, turning, and milling. MTT 100 is a suitable substitute for MTT 147/148. CORE

MTT 148 INTRODUCTION TO MACHINE SHOP I LAB (0-6-3)
This course provides practical application of the concepts and principles of machining operations learned in MTT 147. Topics include machine shop safety, measuring tools, lathes, saws, milling machines, bench grinders, and layout instruments. Upon completion, students will be able to perform the basic operations of measuring, layout, drilling, sawing, turning, and milling. MTT 100 is a suitable substitute for MTT 147/148. This course is aligned with NIMS standards. CORE

MTT 149 INTRODUCTION TO MACHINE SHOP II (2-2-3)
This course provides additional instruction and practice in the use of measuring tools, lathes, milling machines, and grinders. Emphasis is placed on setup and operation of machine tools including the selection of work holding devices, speeds, feeds, cutting tools and coolants. Upon completion, students should be able to perform intermediate level procedures of precision grinding, measuring, layouts, drilling, sawing, turning, and milling. MTT 149/150 are suitable substitutes for MTT 103. This course is aligned with NIMS certification standards.

MTT 150 INTRODUCTION TO MACHINE SHOP II LAB (0-6-3)
This course provides additional instruction and practice in the use of measuring tools, lathes, milling machines, and grinders. Emphasis is placed on setup and operation of machine tools including the selection of work holding devices, speeds, feeds, cutting tools and coolants. Upon completion, students should be able to perform intermediate level procedures of precision grinding, measuring, layouts, drilling, sawing, turning, and milling. MTT 149/150 are suitable substitutes for MTT 103. This course is aligned with NIMS certification standards. CORE

MTT 181 SPECIAL TOPICS IN MACHINE TOOL TECHNOLOGY (1-4-3)
This course is a guided study of special projects in machine tool technology. Emphasis is placed on student needs. Upon completion, students should be able to demonstrate skills developed to meet specific needs.

MTT 182 SPECIAL TOPICS IN MACHINE TOOL TECHNOLOGY (1-4-3)
This course is a guided study of special projects in machine tool technology. Emphasis is placed on student needs. Upon completion, students should be able to demonstrate skills developed to meet specific needs.

MTT 183 SPECIAL TOPICS IN MACHINE TOOL TECHNOLOGY (1-4-3)
This course is a guided study of special projects in machine tool technology. Emphasis is placed on student needs. Upon completion, students should be able to demonstrate skills developed to meet specific needs.

MTT 221 ADVANCED BLUEPRINT READING FOR MACHINISTS (3-0-3)
This course introduces complex industrial blueprints. Emphasis is placed on auxiliary views, section views, violations of true projection, special views, and interpretation of complex parts and assemblies. Upon completion, students should be able to read and interpret complex industrial blueprints. This course is also taught as CNC 221 and MSP 221.

MTT 241 CNC MILLING LAB I (0-6-3)
This course covers basic (3-axis) computer numeric control (CNC) milling machine setup and operating procedures. Upon completion, the student should be able to load a CNC program and setup and operate a 3-axis CNC milling machine to produce a specified part. Related safety, inspection, and process adjustment are also covered.

MTT 270 MACHINING SKILLS APPLICATION (0-3-3)
PREREQUISITE: As determined by college.
CO-REQUISITE: As determined by college.
This course is designed to provide students with a capstone experience incorporating the knowledge and skills learned in the Machine Tool program. Special emphasis is given to student skill attainment.

MTT 281 SPECIAL TOPICS IN MACHINE TOOL TECHNOLOGY (1-4-3)
This course is a guided study of special projects in machine tool technology. Emphasis is placed on student needs. Upon completion, students should be able to demonstrate skills developed to meet specific needs.

MTT 282 SPECIAL TOPICS IN MACHINE TOOL TECHNOLOGY (1-4-3)
This course is a guided study of special projects in machine tool technology. Emphasis is placed on student needs. Upon completion, students should be able to demonstrate skills developed to meet specific needs.

MTT 292 COOPERATIVE EDUCATION IN MACHINE
TOOL TECHNOLOGY (0-15-3)
Students work on a part-time basis in a job directly related to machine tool technology. The employer and supervising instructor evaluate students' progress. Upon course completion, students will be able to apply skills and knowledge in an employment setting.

## MASS COMMUNICATIONS

MCM 100 INTRODUCTION TO MASS COMMUNICATIONS (3-0-3)
This course provides the student with general study of mass communication and journalism. This course includes theory, development, regulation, operation, and effects upon society.

## MATHEMATICS

MAH 101 INTRODUCTORY MATHEMATICS I (2-1-3)
PREREQUISITE: A grade of "C" or higher in MTH 090 or appropriate placement score (S if taken as pass/fail).
This course is a comprehensive review of arithmetic with basic algebra designed to meet the needs of certificate and diploma programs. Topics include business and industry related arithmetic and geometric skills used in

measurement, ratio and proportion, exponents and roots, applications of percent, linear equations, formulas, and statistics. Upon completion, students should be able to solve practical problems in their specific occupational areas of study. NCA

MTH 080 MATHEMATICS LABORATORY (1-0-1)
This course is designed to offer supplemental help to students in mathematics. Students work in a laboratory situation under qualified instructors. This course may be repeated as needed. Emphasis is on arithmetic and algebra, as determined by the individual need of the student. NCA

MTH 090 BASIC MATHEMATICS (3-0-3)
This is a developmental course reviewing arithmetical principles and computations designed to help the student's mathematical proficiency for selected curriculum entrance. NCA

MTH 091 DEVELOPMENTAL ALGEBRA I (3-0-3)
PREREQUISITE: A grade of "C" or higher in MTH 090 or appropriate placement score (S if taken as pass/fail).
This course provides the student with a review of arithmetic and algebra skills. The student's progress in this class and the score on the exit test will determine the next math course to take. NCA

MTH 098 ELEMENTARY ALGEBRA (3-0-3)
PREREQUISITE: A grade of "C" or higher in MTH 090 or appropriate placement score (S if taken as pass/fail).
This course is a review of the fundamental arithmetic and algebra operations. The topics include the numbers of ordinary arithmetic and their properties; integers and rational numbers; the solving of equations; polynomials and factoring; and an introduction to systems of equations and graphs. NCA

MTH 100 INTERMEDIATE COLLEGE ALGEBRA (3-0-3)
PREREQUISITE: A grade of C or higher in MTH 098 or appropriate placement score (S if taken as pass/fail).
This course provides a study of algebraic techniques such as linear equations and inequalities, quadratic equations, systems of equations, and operations with exponents and radicals. Functions and relations are introduced and graphed with special emphasis on linear and quadratic functions. This course does not apply toward the general core requirement for mathematics.

MTH 110 FINITE MATHEMATICS (3-0-3)
PREREQUISITE: High school Algebra I, Geometry, and Algebra II with an appropriate mathematics placement score or a C or higher in Intermediate College Algebra (S if taken as pass/fail).
This course is intended to give an overview of topics in finite mathematics together with their applications, and is taken primarily by students who are not majoring in science, engineering, commerce, or mathematics (i.e., students who are not required to take Calculus). This course will draw on and significantly enhance the student's arithmetic and algebraic skills. The course includes sets, counting, permutations, combinations, basic probability (including Baye's Theorem), and introduction to statistics (including work with Binomial Distributions and Normal Distributions), matrices and their applications to Markov chains and decision theory. Additional topics may include symbolic logic, linear models, linear programming, the simplex method and applications. CORE

MTH 112 PRECALCULUS ALGEBRA (3-0-3)
PREREQUISITE: High school Algebra I, Geometry, and Algebra II with an appropriate mathematics placement score or a C or higher in Intermediate College Algebra (S if taken as pass/fail).
This course emphasizes the algebra of functions - including polynomial, rational, exponential, and logarithmic functions. The course also covers systems of equations and inequalities, quadratic inequalities, and the binomial theorem. Additional topics may include matrices, Cramer's Rule, and mathematical induction. CORE

MTH 113 PRECALCULUS TRIGONOMETRY (3-0-3)
PREREQUISITE: High school Algebra I, Geometry, and Algebra II with an appropriate mathematics placement score or a C or higher in MTH 112 (S if taken as pass/fail).
This course includes the study of trigonometric (circular functions) and inverse trigonometric functions, and includes extensive work with trigonometric identities and trigonometric equations. The course also covers vectors, complex numbers, DeMoivre's Theorem, and polar coordinates. Additional topics may include conic sections, sequences, and using matrices to solve linear systems. CORE

MTH 115 PRECALCULUS ALGEBRA & TRIGONOMETRY (4-0-4)
PREREQUISITE: High school Algebra I, Geometry, and Algebra II with an appropriate mathematics placement score or a C or higher in MTH 100 (S if taken as pass/fail) and receive special permission from the department chairperson.
This course is a one semester combination of Precalculus Algebra and Precalculus Trigonometry intended for superior students. The course covers the following topics: the algebra of functions (including polynomial, rational, exponential, and logarithmic functions), systems of equations and inequalities, quadratic inequalities, and the binomial theorem, as well as the study of trigonometric (circular functions) and inverse trigonometric functions, and includes extensive work with trigonometric identities and trigonometric equations, vectors, complex numbers, DeMoivre's Theorem, and polar coordinates. CORE

MTH 116 MATHEMATICAL APPLICATIONS (3-0-3)
PREREQUISITE: MTH 090 or appropriate mathematics placement score.
This course provides practical applications of mathematics and includes selected topics from consumer math and algebra. Some topics included are integers, percent, interest, ratio and proportion, metric system, probability, linear equations, and problem solving.

MTH 120 CALCULUS AND ITS APPLICATIONS (3-0-3)
PREREQUISITE: High school Algebra I, Geometry, and Algebra II with an appropriate mathematics placement score or a C or higher in MTH 112.
This course is intended to give a broad overview of calculus and is taken primarily by students majoring in Commerce and Business Administration. It includes differentiation and integration of algebraic, exponential, and logarithmic functions and applications to business and economics. The course should include functions of several variables, partial derivatives (including applications), Lagrange Multipliers, L'Hopital's Rule, and multiple integration (including applications). CORE

MTH 125 CALCULUS I (4-0-4)
PREREQUISITE: High school Algebra I, Geometry, and Algebra II with an appropriate mathematics placement score or a C or higher in MTH 113 or MTH 115.
This is the first of three courses in the basic calculus sequence taken primarily by students in science, engineering, and mathematics. Topics include the limit of a function; the derivative of algebraic, trigonometric, exponential, and logarithmic functions; and the definite integral and its basic applications to area problems. Applications of the derivative are covered in detail, including approximations of error using differentials, maximum and minimum problems, and curve sketching using calculus. CORE

MTH 126 CALCULUS II (4-0-4)
PREREQUISITE: High school Algebra I, Geometry, and Algebra II with an appropriate mathematics placement score or a C or higher in MTH 125.
This is the second of three courses in the basic calculus sequence. Topics include vectors in the plane and in space, lines and planes in space, applications of integration (such as volume, arc length, work and average value), techniques of integration, infinite series, polar coordinates, and parametric equations. CORE

MTH 192 PRECALCULUS ALGEBRA LABORATORY (0-2-1)
COREQUISITE: Registration in MTH 112 Pre-calculus Algebra.
This course is designed to accompany a Pre-Calculus Algebra Course. It provides a laboratory setting in which students receive individualized instruction, work on laboratory exercises and group projects. Emphasis will be on applications of mathematics.

MTH 193 PRECALCULUS TRIGONOMETRY LABORATORY (0-2-1)
COREQUISITE: Registration in MTH 113 Pre-Calculus Trigonometry.
This course is designed to accompany a Pre-Calculus Trigonometry Course. It provides a laboratory setting in which students receive individualized instruction, work on laboratory exercises and group projects. Emphasis will be on applications of mathematics.

MTH 194 PRE-CALCULUS ALGEBRA & TRIGONOMETRY LABORATORY (0-2-1)
COREQUISITE: Registration in MTH 115 Pre-Calculus Algebra & Trigonometry.
This course is designed to accompany a Pre-Calculus and Trigonometry Course. It provides a laboratory setting in which students receive individualized instruction, work on laboratory exercises and group projects. Emphasis will be on applications of mathematics.

MTH 195 CALCULUS I LABORATORY (0-2-1)
COREQUISITE: Registration in MTH 125 Calculus I.
This course is designed to accompany a Calculus I Course. It provides a laboratory setting in which students receive individualized instruction, work on laboratory exercises and group projects. Emphasis will be on applications of mathematics.

MTH 196 CALCULUS II LABORATORY (0-2-1)
COREQUISITE: Registration in MTH 126 Calculus II.
This course is designed to accompany a Calculus II Course. It provides a laboratory setting in which students receive individualized instruction, work on laboratory exercises and group projects. Emphasis will be on applications of mathematics.

MTH 227 CALCULUS III (4-0-4)
PREREQUISITE: "C" or higher in MTH 126
This is the third of three courses in the basic calculus sequence. Topics include vector functions, functions of two or more variables, partial derivatives (including applications), quadric surfaces, multiple integration, and vector calculus (including Green's Theorem, Curl and Divergence, surface integrals, and Stokes' Theorem). CORE

MTH 231 MATH FOR ELEMENTARY SCHOOL TEACHERS (3-0-3)
PREREQUISITE: As required by program.
This course is designed to provide appropriate insights into mathematics for students majoring in elementary education and to ensure that students going into elementary education are more than proficient at performing basic arithmetic operations. Topics include logic, sets and functions, operations and properties of whole numbers and integers including number theory; use of manipulatives by teachers to demonstrate abstract concepts; and by students while learning these abstract concepts as emphasized in the class. Upon completion, students are required to demonstrate proficiency in each topic studied as well as to learn teaching techniques that are grade level and subject matter appropriate, and test for mathematical proficiency and the learning of teaching concepts.

MTH 237 LINEAR ALGEBRA (3-0-3)
PREREQUISITE: MTH 126
This course introduces the basic theory of linear equations and matrices, real vector spaces, bases and dimension, linear transformations and matrices, determinants, eigenvalues and eigenvectors, inner product spaces, and the diagonalization of symmetric matrices. Additional topics may include quadratic forms and the use of matrix methods to solve systems of linear differential equations. CORE

MTH 238 APPLIED DIFFERENTIAL EQUATIONS I (3-0-3)
PREREQUISITE or COREQUISITE: MTH 227
An introduction to numerical methods, qualitative behavior of first order differential equations, techniques for solving separable and linear equations analytically, and applications to various models (e.g. populations, motion, chemical mixtures, etc.); techniques for solving higher order linear differential equations with constant coefficients (general theory, undetermined coefficients, reduction of order and the method of variation of parameters), with emphasis on interpreting the behavior of the solutions, and applications to physical models whose governing equations are of higher order; and the Laplace transform as a tool for the solution of initial value problems whose inhomogeneous terms are discontinuous. CORE

MTH 265 ELEMENTARY STATISTICS (3-0-3)
PREREQUISITE: MTH 100 or appropriate placement score.
This course provides an introduction to methods of statistics, including the following topics: sampling, frequency distributions, measures of central tendency, graphic representation, reliability, hypothesis testing, confidence intervals, analysis, regression, estimation, and applications. Probability, permutations, combinations, binomial theorem, random variables, and distributions may be included.

MTH 297 CALCULUS III LABORATORY (0-2-1)
COREQUISITE: Registration in MTH 227 Calculus III.
This course is designed to accompany a Calculus III Course. It provides a laboratory setting in which students receive individualized instruction, work on laboratory exercises and group projects. Emphasis will be on applications of mathematics.

## MINING TECHNOLOGY

MNT 100 UNDERGROUND NEW MINER (3-0-3)
PREREQUISITE: As required by college.
This course will provide the student with the basic knowledge and understanding necessary for entry level employment in underground coal mining. Emphasis is placed on the safety and health aspects of federal and state regulations pertaining to underground coal mining. Upon completion, the student will understand the federal and state laws governing underground coal mining.

MNT 120 SURFACE NEW MINER (2-0-2)
PREREQUISITE: As required by college.
This course will provide the student with the basic knowledge and understanding necessary for entry level employment in surface mining. Emphasis is placed on federal and state regulations pertaining to surface mining. Upon completion, students will understand the federal and state laws governing surface of coal mining.

MNT 135 FIRST RESPONDER (3-0-3)
PREREQUISITE: As required by college.
This course is designed to provide students with skills to perform basic first aid in a variety of emergency situations. Specific topics include assessing victims, basic life support, CPR certification, natural disaster response, and treating victims for various traumas. At the conclusion of this course students will be able to provide basic life support for victims.

MNT 140 ELECTRICAL CERTIFICATION (5-2-6)
PREREQUISITE: As required by college.
This course provides the student with adequate information on direct current theory, alternating current theory, Ohm's Law, circuits, federal and state mining laws, and the National Electrical Code as applicable to the Mine Safety and Health Administration/State of Alabama certification. Upon completion, the student will have information necessary to pass the state certification examination.

MNT 175 BASIC HYDRAULICS (4-2-6)
PREREQUISITE: As required by college.
This course provides the student with a study of force and energy, pumps, actuators, control valves, flow valves, pressure valves, reservoirs, coolers, filters, motors, symbols, and print reading. Emphasis is placed on troubleshooting and maintaining hydraulic systems. Upon completion, students will understand basic hydraulic principles, how to troubleshoot hydraulic systems, and how to maintain hydraulic components.

## MUSIC

MUS 100 CONVOCATION (1-0-1)
This course (required for music majors/minors each semester) is designed to expose students to a variety of repertory styles and to give students an opportunity to practice individual performance skills. Emphasis is placed on exposure to performances and lectures by guest artists, faculty or students, and on personal performance(s) in class each semester.

MUS 101 MUSIC APPRECIATION (3-0-3)
This course is designed for non-music majors and requires no previous musical experience. It is a survey course that incorporates several modes of instruction including lecture, guided listening, and similar experiences involving music. The course will cover a minimum of three (3) stylistic periods, provide a multi-cultural perspective, and include both vocal and instrumental genres. Upon completion, students should be able to demonstrate a knowledge of music fundamentals, the aesthetic/stylistic characteristics of historical periods, and an aural perception of style and structure in music. CORE

MUS 111 MUSIC THEORY I (3-0-3)
PREREQUISITE: Advisor approval
COREQUISITE: MUS 113, if ear training lab is a separate course.
This course introduces the student to the diatonic harmonic practices in the Common Practice Period. Topics include fundamental musical materials (rhythm, pitch, scales, intervals, diatonic harmonies) and an introduction to the principles of voice leading and harmonic progression. Upon completion, students should be able to demonstrate a basic competency using diatonic harmony through analysis, writing, sight singing, dictation and keyboard skills.
MUS 112 MUSIC THEORY II (3-0-3)
PREREQUISITE: MUS 111
COREQUISITE: MUS 114, if ear training lab is a separate course.

This course completes the study of diatonic harmonic practices in the Common Practice Period and introduces simple musical forms. Topics include principles of voice leading used in three- and four-part triadic harmony and diatonic seventh chords, non-chord tones, cadences, phrases and periods. Upon completion, students should be able to demonstrate competence using diatonic harmony through analysis, writing, sight singing, dictation and keyboard skills.

MUS 113 MUSIC THEORY LAB I (0-2-1)
PREREQUISITE: Advisor approval
COREQUISITE: MUS 111, if ear training lab is a separate course.
This course provides the practical application of basic musical materials through sight singing; melodic, harmonic and rhythmic dictation; and keyboard harmony. Topics include intervals, simple triads, diatonic stepwise melodies, basic rhythmic patterns in simple and compound meter and four-part triadic progressions in root position. Upon completion, students should be able to write, sing and play intervals, scales, basic rhythmic patterns, diatonic stepwise melodies, simple triads and short four-part progressions in root position.

MUS 114 MUSIC THEORY LAB II (0-2-1)
PREREQUISITE: MUS 113
COREQUISITE: MUS 112, if ear training lab is a separate course.
This course continues the practical application of diatonic musical materials through sight singing; melodic, harmonic and rhythmic dictation; and keyboard harmony. Topics include intervals, scales, diatonic melodies with triadic arpeggiations, more complex rhythmic patterns in simple and compound meter and four-part diatonic progressions in all inversions. Upon completion, students should be able to write, sing and play all intervals, rhythmic patterns employing syncopations and beat divisions, diatonic melodies and four-part diatonic progressions.

MUS 115 FUNDAMENTALS OF MUSIC (3-0-3)
This course is designed to teach the basic fundamentals of music and develop usable musical skills for the classroom teacher. Topics include rhythmic notation, simple and compound meters, pitch notation, correct singing techniques, phrases, keyboard awareness, key signatures, scales, intervals and harmony using I, IV, and V with a chordal instrument. Upon completion, students should be able to sing a song, harmonize a simple tune, demonstrate rhythmic patterns and identify musical concepts through written documentation.

MUS 170 INTRODUCTION TO CHURCH MUSIC (3-0-3)
This course provides an overview of church music as a career choice, and includes the organization and operation of a graded church choir program. Topics include an introduction to conducting, rehearsal techniques, administrative skills, and may include a supervised practicum field experience. Upon completion, students should be able to select, prepare, teach and conduct a simple anthem for a graded church choir and demonstrate a knowledge of church music administration through written documentation.

MUS 211 MUSIC THEORY III (3-0-3)
PREREQUISITE: MUS 112
COREQUISITE: MUS 213, if ear training lab is a separate course.
This course introduces the student to the chromatic harmonic practices in the Common Practice Period. Topics include secondary functions, modulatory techniques, and binary and ternary forms. Upon completion, students should be able to demonstrate competence using chromatic harmony through analysis, writing, sight singing, dictation and keyboard skills.

MUS 212 MUSIC THEORY IV (3-0-3)
PREREQUISITE: MUS 211
COREQUISITE: MUS 214, if ear training lab is a separate course.
This course completes the study of chromatic harmonic practices in the Common Practice Period and introduces the student to twentieth-century practices. Topics include the Neapolitan and augmented sixth chords, sonata form, late nineteenth-century tonal harmony and twentieth-century practices and forms. Upon completion, students should be able to demonstrate competence using chromatic harmony and basic twentieth century techniques through analysis, writing, sight singing, dictation and keyboard skills.

MUS 213 MUSIC THEORY LAB III (0-2-1)
PREREQUISITE: MUS 114
COREQUISITE: MUS 211, if ear training lab is a separate course.
This course provides the practical application of chromatic musical materials through sight singing; melodic, harmonic and rhythmic dictation; and keyboard harmony. Topics include melodies with simple modulations, complex rhythms in simple and compound meter, and secondary function chords. Upon completion, students should be able to write, sing and play modulating melodies, rhythmic patterns with beat subdivisions and four-part chromatic harmony.

MUS 214 MUSIC THEORY LAB IV (0-2-1)
PREREQUISITE: MUS 213
COREQUISITE: MUS 212, if ear training lab is a separate course.
This course provides the practical application of chromatic musical materials and simple twentieth-century practices through sight singing; melodic, harmonic and rhythmic dictation; and keyboard harmony. Topics include chromatic and atonal melodies; complex rhythmic patterns in simple, compound and asymmetric meters; chromatic chords and twentieth-century harmony. Upon completion, students should be able to write, sing and play chromatic and atonal melodies, complex rhythms and meters, four-part chromatic harmony and simple twentieth-century chord structures.

MUS 251 INTRODUCTION TO CONDUCTING (3-0-3)
PREREQUISITE: Advisor approval.
This course introduces the fundamentals of conducting choral and/or instrumental ensembles. Topics include a study of simple and compound meters, score reading and techniques for conducting effective rehearsals. Upon completion, students should be able to prepare and conduct a choral and/or instrumental score in a rehearsal or performance setting.

## MUSIC ENSEMBLE

MUL 101-02; 201-02 CLASS PIANO I, II, III, IV (0-2-1)
MUL 111-12; 211-12 CLASS VOICE I, II, III, IV (0-2-1)
Group instruction is available in voice and piano for students with little or no previous training. Emphasis is placed on the rudiments of music, basic performance technique and general musicianship skills. Upon completion of one or a sequence of courses, students should be able to demonstrate a basic proficiency in singing or playing and a knowledge of music fundamentals.

MUL 172-73; 272-73 MUSICAL THEATRE WORKSHOP I, II, III, IV (0-2-1)
PREREQUISITE: Advisor approval.
This course includes the study of musical theatre history, styles, performance and technical production. Emphasis is placed on the supervised study, preparation, production and performances of scenes or complete works of musical theatre. Upon completion, students should be able to effectively participate in a public presentation of the prepared scenes or work in an assigned performance or technical role.

MUL 180-81; 280-81, CHORUS I, II, III, IV (0-2-1)
MUL 182-83; 282-83, VOCAL ENSEMBLE I, II, III, IV (0-2-1)
MUL 190-91; 290-91, CONCERT BAND I, II, III, IV (0-2-1)
MUL 192-93; 292-93, INSTRUMENTAL ENSEMBLE I, II, III, IV (0-2-1)
MUL 196-97; 296-97, JAZZ/SHOW BAND I, II, III, IV (0-2-1)
PREREQUISITE: Advisor approval.
This course provides an opportunity for students to participate in a performing ensemble. Emphasis is placed on rehearsing and performing literature appropriate to the mission and goals of the group. Upon completion, students should be able to effectively participate in performances presented by the ensemble.

## MUSIC PERFORMANCE

MUP 101-02; 201-02, PRIVATE PIANO I, II, III, IV (0-.5-1)
MUP 103-04; 203-04, PRIVATE ORGAN I, II, III, IV (0-.5-1)
MUP 111-12; 211-12, PRIVATE VOICE I, II, III, IV (0-.5-1)
MUP 133-34; 233-34, PRIVATE GUITAR I, II, III, IV (0-.5-1)
MUP 141-42; 241-42, PRIVATE FLUTE I, II, III, IV (0-.5-1)
MUP 143-44; 243-44, PRIVATE CLARINET I, II, III, IV (0-.5-1)
MUP 145-46; 245-46, PRIVATE SAXOPHONE I, II, III, IV (0-.5- 1)
MUP 151-52; 251-52, PRIVATE OBOE I, II, III, IV (0-.5-1)
MUP 153-54; 253-54, PRIVATE BASSOON I, II, III, IV (0-.5-1)
MUP 161-62; 261-62, PRIVATE TRUMPET I, II, III, IV (0-.5-1)
MUP 163-64; 263-64, PRIVATE FRENCH HORN I, II, III, IV (0-.5-1)
MUP 171-72; 271-72, PRIVATE TROMBONE I, II, III, IV (0-.5- 1)
MUP 175-76; 275-76, PRIVATE TUBA I, II, III, IV (0-.5-1)
MUP 181-82; 281-82, PRIVATE PERCUSSION I, II, III, IV (0-.5-1)
PREREQUISITE: Advisor approval.
Individual performance instruction is available in keyboard instruments, voice,

strings, woodwinds, brass, percussion and fretted instruments. Emphasis is placed on developing technique, repertoire and performance skills commensurate with the student's educational goals. Students are required to practice a minimum of five hours per week for each credit hour. Upon completion, students should be able to effectively perform assigned repertoire and technical studies in an appropriate performance evaluation setting.

## NURSING

Following each course description a sequence of four numbers appears. Using NUR 102, Fundamentals of Nursing as an example (3-6-3-6) - the first number "3" indicates the classroom (theory) hours; the second number "6" indicates the laboratory hours; the third number "3" indicates the clinical hours; the fourth number identifies the semester hour credit of the course. Laboratory hours are generally spent in hands-on application on the campus. Clinical hours are spent in various health care settings.

NUR 102 FUNDAMENTALS OF NURSING (3-6-3-6)
COREQUISITE: NUR 103, NUR 104 (and NUR 101 for PN students).
This course provides opportunities to develop competencies necessary to meet the needs of individuals throughout the lifespan in a safe, legal, and ethical manner using the nursing process. Students learn concepts and theories basic to the art and science of nursing. The role of the nurse as a member of the healthcare team is emphasized. Students are introduced to the concepts of client needs, safety, communication, teaching/learning, critical thinking, ethical-legal issues, cultural diversity, nursing history, and the program's philosophy of nursing. Additionally, this course introduces psychomotor nursing skills needed to assist individuals in meeting basic human needs. Skills necessary for maintaining microbial, physical, and psychological safety are introduced along with skills needed in therapeutic interventions. At the conclusion of this course students demonstrate competency in performing basic nursing skills for individuals with common health alterations.

NUR 103 HEALTH ASSESSMENT (0-3-0-1)
COREQUISITE: NUR 103, NUR 104 (and NUR 101 for PN students).
This course is designed to provide students the opportunity to learn and practice history taking and physical examination skills with individuals of all ages, with emphasis on the adult. The focus is on symptom analysis along with physical, psychosocial, and growth and development assessments. Students will be able to utilize critical thinking skills in identifying health alterations, formulating nursing diagnoses and documenting findings appropriate to nursing.

NUR 104 INTRODUCTION TO PHARMACOLOGY (0-3-0-1)
COREQUISITE: NUR 103, NUR 104 (and NUR 101 for PN students).
This course provides opportunities to develop competencies necessary to meet the needs of individuals throughout the lifespan in a safe, legal, and ethical manner using the nursing process. This course introduces students to basic principles of pharmacology and the knowledge necessary to safely administer medication. Course content includes legal implications, pharmacokinetics, pharmacodynamics, calculations of drug dosages, medication administration, and an overview of drug classifications. Students will be able to calculate and administer medications.

NUR 105 ADULT NURSING (5-3-6-8)
PREREQUISITE: NUR 102, NUR 103, NUR 104 (and NUR 101 for PN students).
COREQUISITE: NUR 106, ENG 101.
This course provides opportunities to develop competencies necessary to meet the needs of individuals throughout the lifespan in a safe, legal, and ethical manner using the nursing process. Emphasis is placed on providing care to individuals undergoing surgery, fluid and electrolyte imbalance, and common alterations in respiratory, musculoskeletal, gastrointestinal, cardiovascular, endocrine, and integumentary systems. Nutrition, pharmacology, communication, cultural, and community concepts are integrated.

NUR 106 MATERNAL AND CHILD NURSING (4-0-3-5)
PREREQUISITE: NUR 102, NUR 103, NUR 104 (and NUR 101 for PN students).
COREQUISITE: NUR 105, ENG 101.
This course focuses on the role of the nurse in meeting the physiological, psychosocial, cultural and developmental needs of the maternal and child client. Course content includes antepartal, intrapartal, and postpartal care, complications of pregnancy, newborn care, human growth and development, pediatric care, and selected pediatric alterations. Nutrition, pharmacology, cultural diversity, use of technology, communication, anatomy and physiology review, medical terminology, critical thinking, and application of the nursing process are integrated throughout this course. Upon completion of this course students will be able to provide and manage care for maternal and pediatric clients in a variety of settings.

NUR 107 ADULT/CHILD NURSING (5-0-9-8)
PREREQUISITE: NUR 105, NUR 106, ENG 101.
COREQUISITE: NUR 108, NUR 109.
This course provides students with opportunities to develop competencies necessary to meet the needs of individuals throughout the life span in a safe, legal, and ethical manner using the nursing process in a variety of settings. Emphasis is placed on providing care to individuals experiencing complex alterations in: sensory/perceptual reproductive, endocrine, genitourinary, neurological, immune, cardiovascular, and lower gastrointestinal systems. Additional instruction is provided for care for clients experiencing burns, cancer, and emergent conditions. Nutrition, pharmacology, therapeutic communication, community, cultural diversity, health promotion, error prevention, critical thinking, impacts on maternal and child clients are integrated throughout the course.

NUR 108 PSYCHOSOCIAL NURSING (2-0-3-3)
PREREQUISITE: NUR 105, NUR 106, ENG 101.
COREQUISITE: NUR 107, NUR 109.
This course is designed to provide an overview of psychosocial adaptation and coping concepts used when caring for clients with acute and chronic alterations in mental health in a variety of settings. Topics include therapeutic communication skills, normal and abnormal behaviors, treatment modalities, and developmental needs. Upon completion of this course, students will demonstrate the ability to assist clients in maintaining psychosocial integrity through the use of the nursing process.

NUR 109 ROLE TRANSITION FOR THE PRACTICAL NURSE (2-3-0-3)
PREREQUISITE: NUR 105, NUR 106, ENG 101.
COREQUISITE: NUR 107, NUR 108.
This course provides students with opportunities to gain knowledge and skills necessary to transition from student to practicing nurse. Content includes a discussion of current issues in health care, practical nursing leadership and management, professional practice issues, and transition into the workplace. Emphasis is placed on NCLEX-PN test-taking skills, computer-assisted simulations and practice tests, development of a prescriptive plan for remediation, and review of selective content specific to the practice of practical nursing.

NUR 200 NURSING CAREER MOBILITY ASSESSMENT (3-1-1-0-5)
PREREQUISITE: MTH 100 or higher level math, BIO 201, 202, ENG 101
COREQUISITE: As required by program.
This course focuses on application of nursing science to assist the Licensed Practical Nurse (LPN) transitioning into the role of the associate degree nurse (ADN). Emphasis in this course is placed on evidenced based clinical decision making and nursing care provided in a family and community context for a variety of health alterations across the lifespan. Upon successful completion of the course students will be able to articulate into the ADN program. 16 non-traditional credits will be awarded after the successful completion of this course.

NUR 201 NURSING THROUGH THE LIFESPAN I (3-0-6-5)
PREREQUISITE: NUR 105, NUR 106, ENG 101.
COREQUISITE: PSY 200, BIO 220.
This course provides opportunities to develop competencies necessary to meet the needs of individuals throughout the lifespan in a safe, legal, and ethical manner using the nursing process. Students manage and provide collaborative care to clients who are experiencing selected alterations in gastrointestinal, reproductive, sensory, and endocrine systems in a variety of settings. Additional instruction is provided for oncology, mental health, teaching/learning concepts, and advanced dosage calculations. Nutrition, pharmacology, communication, cultural, and community concepts are integrated.

NUR 202 NURSING THROUGH THE LIFESPAN II (3-0-9-6)
PREREQUISITE: NUR 201, BIO 220, PSY 200, ENG 101.
COREQUISITE: PSY 210, and SPH 106 or SPH 107.
This course builds upon previous instruction and provides additional opportunities to develop competencies necessary to meet the needs of individuals throughout the lifespan in a safe, legal, and ethical manner using the nursing process. Students manage and provide collaborative care to clients who are experiencing selected alterations in cardiovascular, hematologic, immune, and genitourinary systems in a variety of settings. Additional instruction is provided for psychiatric disorders, and high-risk obstetrics. Teaching/learning concepts, advanced dosage calculations, nutrition, pharmacology, communication, cultural, and community concepts are integrated.

NUR 203 NURSING THROUGH THE LIFESPAN III (4-0-6-6)
PREREQUISITE: PSY 210, NUR 202, and SPH 106 or SPH 107.
COREQUISITE: NUR 204, Humanities elective.
This course builds upon previous instruction and provides additional opportunities to develop competencies necessary to meet the needs of individuals throughout the lifespan in a safe, legal, and ethical manner using the nursing process. Students manage and provide collaborative care to clients who are experiencing selected alterations in cardiovascular, respiratory, and neurological systems in a variety of settings. Additional instruction is provided to care for selected mental health disorders, selected emergencies, multiple organ dysfunction syndrome and related disorders. Teaching/learning concepts, advanced dosage calculations, nutrition, pharmacology, communication, cultural, and community concepts are integrated.

NUR 204 ROLE TRANSITION FOR THE REGISTERED NURSE (2-0-6-4)
PREREQUISITE: PSY 210, NUR 202, and SPH 106 or SPH 107.
COREQUISITE: NUR 203, Humanities elective.
This course provides students with opportunities to gain knowledge and skills necessary to transition from student to registered nurse. Content includes current issues in health care, nursing leadership and management, professional practice issues for registered nurses, and transition into the workplace. Additional instruction is provided for preparing for the NCLEX-RN.

## NURSE ASSISTANT/NURSING AIDE

NAS 100 LONG TERM CARE NURSING ASSISTANT (3-0-3)
This course fulfills the seventy-five (75) hour Omnibus Budget Reconciliation Act (OBRA) requirements for training of long-term care nursing assistants in preparation for certification through competency evaluation. Emphasis is placed on the development of the knowledge, attitudes, and skills required of the long-term care nursing assistant. Upon completion of this course, the student should demonstrate satisfactory performance on written examinations and clinical skills.

## OFFICE ADMINISTRATION/BUSINESS OFFICE MGMNT

OAD 101 BEGINNING KEYBOARDING (3-0-3)
This course is designed to be able to use the touch method of keyboarding through classroom instruction and outside lab. Emphasis is on speed and accuracy in keying alphabetic, symbol, and numeric information using a keyboard. Upon completion, the student should be able to demonstrate proper technique and an acceptable rate of speed and accuracy as defined by the course syllabus, in the production of basic business documents such as memoranda, letters, reports, etc.

OAD 103 INTERMEDIATE KEYBOARDING (3-0-3)
PREREQUISITE: OAD 101 or test above 30 words per minute
This course is designed to assist the student in increasing speed and accuracy using the touch method of keyboarding through classroom instruction and lab exercises. Emphasis is on the production of business documents such as memoranda, letters, reports, tables, and outlines from unarranged rough draft to acceptable format. Upon completion, the student should be able to demonstrate proficiency and an acceptable rate of speed and accuracy, as defined by the course syllabus, in the production of business documents. CORE

OAD 131 BUSINESS ENGLISH (3-0-3)
This course is designed to develop the student's ability to use proper English. Emphasis is on grammar, spelling, vocabulary, punctuation, word usage, word division, and proofreading. Upon completion, the student should be able to communicate effectively.

OAD 133 BUSINESS COMMUNICATIONS (3-0-3)
PREREQUISITE: CIS 146 or OAD 103 plus OAD 131 or ENG 101 with a "C" or higher.
This course is designed to provide the student with skills necessary to communicate effectively. Emphasis is on the application of communication principles to produce clear, correct, logically-organized business communications. Upon completion, the student should be able to demonstrate effective communication techniques in written, oral, and nonverbal communications.

OAD 138 RECORDS/INFORMATION MANAGEMENT (3-0-3)
This course is designed to give the student knowledge about managing office records and information. Emphasis is on basic filing procedures, methods, systems, supplies, equipment, and modern technology used in the creation, protection, and disposition of records stored in a variety of forms. Upon completion, the student should be able to perform basic filing procedures. CORE

OAD 200 MACHINE TRANSCRIPTION (3-0-3)
PREREQUISITE: OAD 103
or advisor approval.
This course is designed to develop marketable skills in transcribing various forms of dictated material through classroom instruction. Emphasis is on the use of microcomputers and a commercial word processing package. Upon completion, the student should be able to accurately transcribe documents from dictated recordings.

OAD 202 LEGAL TRANSCRIPTION (3-0-3)
PREREQUISITE: OAD 200 with grade of "C" or higher or advisor approval.
This course is designed to familiarize students with legal terms and provide transcription skill development in the production of legal correspondence, forms, and court documents through classroom instruction and lab exercises. Emphasis is on transcribing error-free legal documents using transcription equipment. Upon completion, students should be able to demonstrate the ability to accurately transcribe legal documents that are appropriately formatted.

OAD 203 LEGAL OFFICE PROCEDURES (3-0-3)
This course is designed to provide an awareness of the responsibilities and opportunities of professional support personnel in a legal environment through classroom instruction and lab exercises. Emphasis is on legal terminology, the production of appropriate forms and reports, and the importance of office procedures and practices. Upon completion, the student should be able to perform office support tasks required for employment in a legal environment.

OAD 211 MEDICAL TERMINOLOGY (3-0-3)
This course is designed to familiarize the student with medical terminology. Emphasis is on the spelling, definition, pronunciation, and usage of medical terms. Upon completion, the student should be able to communicate effectively using medical terminology.

OAD 212 MEDICAL TRANSCRIPTION (3-0-3)
PREREQUISITE: OAD 200 with grade of "C" or higher or advisor approval.
This course is designed to orient students to standard medical reports, correspondence, and related documents transcribed in a medical environment through classroom instruction. Emphasis is on transcribing medical records from dictated recordings. Learn/maintain standards of ethical/professional conduct. Upon completion, the student should be able to accurately transcribe medical documents from dictated recordings.

OAD 232 THE COMPUTERIZED OFFICE (3-0-3)
PREREQUISITE: OAD 133
This course is designed to enable the student to develop skill in the use of integrated software through classroom instruction and lab exercises. Emphasis is on the use of computerized equipment, software, and communications technology. Upon completion, the student should be able to satisfactorily perform a variety of office tasks using current technology.

## ORIENTATION

ORI 107 STUDENT SURVIVAL SKILLS (1-0-1)
This course is designed to provide students with information to improve their success as students in a college environment. Specific topics include stress management, time management, goal setting, improving listening and note taking skills, identification of optimum learning styles, reading skills, study skills, problem solving and decision making, test taking strategies, and financial management.

## PHILOSOPHY

PHL 106 INTRODUCTION TO PHILOSOPHY (3-0-3)
This course is an introduction to the basic concepts of philosophy. The literary and conceptual approach of the course is balanced with emphasis on approaches to ethical decision making. The student should have an understanding of major philosophical ideas in a historical survey from the early Greeks to the modern era. CORE

PHL 206 ETHICS AND SOCIETY (3-0-3)
This course involves the study of ethical issues which confront individuals in the course of their daily lives. The focus is on the fundamental questions of right and wrong, of human rights, and of conflicting obligations. The student should be able to understand and be prepared to make decisions in life regarding ethical issues. CORE

## PHLEBOTOMY

CLT 101 PHLEBOTOMY CERTIFICATION (2-3-3)
PREREQUISITE: Phlebotomy advisor approval.
The Phlebotomy Certification course is designed to train individuals to properly collect and process blood and other clinical specimens for laboratory testing and to interact with health care personnel, patients, and the general public. The course is designed to prepare individuals to write the Phlebotomist Examination.

CLT 102 PHLEBOTOMY CLINICAL (0-12-4)
PREREQUISITE: Phlebotomy advisor approval.
This is a supervised practicum within the clinical setting that provides laboratory practice in phlebotomy. Emphasis is placed on collection techniques, specimen processing, work flow practices, referrals, and utilizing laboratory information system.

## PHYSICAL EDUCATION

PED 100 FUNDAMENTALS OF FITNESS (3-0-3)
This lecture course includes the basic principles of physical education and physical fitness. It explores psychological and physiological effects of exercise and physical fitness, including effects on the human skeleton, muscle development, respiration, and coordination. It is viewed as an introduction to such laboratory courses as slimnastics, weight training, and conditioning. The course may also include fitness evaluation, development of individual fitness programs, and participation in fitness activities.

PED 103 WEIGHT TRAINING (BEGINNING) (0-2-1)
This course introduces the basics of weight training. Emphasis is placed on developing muscular strength, muscular endurance, and muscle tone. Upon completion, students should be able to establish and implement a personal weight training program.

PED 104 WEIGHT TRAINING (INTERMEDIATE) (0-2-1)
PREREQUISITE: PED 103
This course covers advanced levels of weight training. Emphasis is placed on meeting individual training goals and addressing weight training needs and interests. Upon completion, students should be able to establish and implement an individualized advanced weight training program.

PED 105 PERSONAL FITNESS (0-2-1)
PREREQUISITE: PED 103
This course is designed to provide the student with information allowing him or her to participate in a personally developed fitness program. Topics include cardiovascular, strength, muscular endurance, flexibility and body composition.

PED 106 AEROBICS (0-2-1)
This course introduces a program of cardiovascular fitness involving continuous, rhythmic exercise. Emphasis is placed on developing cardiovascular efficiency, strength, and flexibility and on safety precautions. Upon completion, students should be able to select and implement a rhythmic aerobic exercise program.

PED 118 GENERAL CONDITIONING (BEGINNING) (0-2-1)
This course provides an individualized approach to general conditioning utilizing the five major components. Emphasis is placed on the scientific basis for setting up and engaging in personalized physical fitness and conditioning programs. Upon completion, students should be able to set up and implement an individualized physical fitness and conditioning program.

PED 119 GENERAL CONDITIONING (INTERMEDIATE) (0-2-1)
PREREQUISITE: PED 118
This course is an intermediate-level fitness and conditioning program class. Topics include specific exercises contributing to fitness and the role exercise plays in developing body systems. Upon completion, students should be able to implement and evaluate an individualized physical fitness and conditioning program.

PED 200 FOUNDATIONS OF PHYSICAL EDUCATION (3-0-3)
In this course, the history, philosophy, and objectives of health, physical education, and recreation are studied with emphasis on the physiological, sociological, and psychological values of physical education. It is required of all physical education majors.

## PHYSICAL SCIENCE

PHS 111 PHYSICAL SCIENCE I (3-2-4)
This course provides the non-technical student with an introduction to the basic principles of geology, oceanography, meteorology, and astronomy. Laboratory is required. CORE

PHS 112 PHYSICAL SCIENCE II (3-2-4)
This course provides the non-technical student with an introduction to the basic principle of chemistry and physics. Laboratory is required. CORE

## PHYSICS

PHY 120 INTRODUCTION TO PHYSICS (3-2-4)
PREREQUISITE: MTH 098 or higher or appropriate placement score.
This course provides an introduction to general physics for non-science majors. Topics in fundamentals of mechanics, properties of matter, heat and temperature, simple harmonic motion, SHM, waves and sound, electricity and magnetism, optics and modern physics. Laboratory is required.

PHY 201 GENERAL PHYSICS I-TRIG BASED (3-2-4)
PREREQUISITE: MTH 113 or appropriate placement score.
This course is designed to cover general physics at a level that assumes previous exposure to college algebra and basic trigonometry. Specific topics include mechanics, properties of matter and energy, thermodynamics, and periodic motion. A laboratory is required. CORE

PHY 202 GENERAL PHYSICS II-TRIG BASED (3-2-4)
PREREQUISITE: PHY 201
This course is designed to cover general physics using college algebra and basic trigonometry. Specific topics include wave motion, sound, light optics, electrostatics, circuits, magnetism, and modern physics. Laboratory is required. CORE

PHY 205 RECITATION IN GENERAL PHYSICS I-TRIG BASED (1-0-1)
PREREQUISITE: As required by program.
One hour weekly for problem solving.

PHY 206 RECITATION IN GENERAL PHYSICS II-TRIG BASED (1-0-1)
PREREQUISITE: As required by program.
One hour weekly for problem solving.

PHY 213 GENERAL PHYSICS WITH CAL I (3-2-4)
PREREQUISITE: MTH 125
This course provides a calculus-based treatment of the principle subdivisions of classical physics: mechanics and energy, including thermodynamics. Laboratory is required. CORE

PHY 214 GENERAL PHYSICS WITH CAL II (3-2-4)
PREREQUISITE: PHY 213
This course provides a calculus-based study in classical physics. Topics included are: simple harmonic motion, waves, sound, light, optics, electricity and magnetism. Laboratory is required. CORE

PHY 216 RECITATION IN GENERAL PHYSICS WITH CAL I (1-0-1)
One hour weekly for problem solving.
PHY 217 RECITATION IN GENERAL PHYSICS WITH CAL II (1-0-1)
One hour weekly for problem solving.

## POLITICAL SCIENCE

POL 200 INTRODUCTION TO POLITICAL SCIENCE (3-0-3)
PREREQUISITE: Advisor approval.
This course is an introduction to the field of political science through examination of the fundamental principles, concepts, and methods of the discipline, and the basic political processes and institutions of organized political systems. Topics include approaches to political science, research methodology, the state, government, law, ideology, organized political influences, governmental bureaucracy, problems in political democracy, and international politics. Upon completion, students should be able to identify, describe, define, analyze, and explain relationships among the basic principles and concepts of political science and political processes and institutions of contemporary political systems. CORE

POL 211 AMERICAN NATIONAL GOVERNMENT (3-0-3)
PREREQUISITE: Advisor approval.
This course surveys the background, constitutional principles, organization, and operation of the American political system. Topics include the U. S. Constitution, federalism, civil liberties, civil rights, political parties, interest groups, political campaigns, voting behavior, elections, the presidency, bureaucracy, Congress, and the justice system. Upon completion, students should be able to identify and explain relationships among the basic elements of American government and function as more informed participants of the American political system. CORE

## PSYCHOLOGY

PSY 106 CAREER EXPLORATION (1-0-1)
This course is designed to explore potential career fields. It includes an assessment, thorough testing of strengths and weaknesses, general information about careers and job skills, instruction in value and decision making techniques and career research.

PSY 107 STUDY SKILLS (1-0-1)
In this course, emphasis is placed on the skills of "how to study." The course introduces the student to effective techniques for listening in class, note taking, preparation for test taking, and an overall system of successful study.

PSY 200 GENERAL PSYCHOLOGY (3-0-3)
This course is a survey of behavior with emphasis upon psychological processes. This course includes the biological bases for behavior, thinking, emotion, motivation, and the nature and development of personality. CORE

PSY 210 HUMAN GROWTH AND DEVELOPMENT (3-0-3)
PREREQUISITE: PSY 200
This course is the study of the psychological, social, and physical factors that affect human behavior from conception to death. CORE

PSY 211 CHILD GROWTH AND DEVELOPMENT (3-0-3)
This course is a systematic study of the behavior and psychological development of the child from conception to adolescence. Emphasis will be placed on principles underlying physical, mental, emotional and social development, methods of child study, and practical implications.

PSY 230 ABNORMAL PSYCHOLOGY (3-0-3)
PREREQUISITE: PSY 200
This course is a survey of abnormal behavior and its social and biological origins. The anxiety related disorders, psychoses, personality disorders and mental deficiencies will be covered.

## READING

RDG 083 DEVELOPMENTAL READING I (3-0-3)
This course is designed to assist students whose placement test scores indicate serious difficulty with decoding skills, comprehension, vocabulary, and study skills.

RDG 114 CRITICAL READING FOR COLLEGE (3-0-3)
PREREQUISITE: Appropriate reading placement score or a grade of "S" in RDG 083.
This course is designed to enhance critical reading skills. Topics include vocabulary enrichment, reading flexibility, metacognitive strategies, and advanced comprehension skills, including analysis and evaluation. Upon completion, students should be able to demonstrate comprehension and analysis and respond effectively to material across disciplines.

## RELIGION

REL 100 HISTORY OF WORLD RELIGIONS (3-0-3)
This course is designed to acquaint the student with the beliefs and practices of the major contemporary religions of the world. This includes the religions of Africa, the Orient, and the western world. The student should have an understanding of the history and origins of the various religions in the world. CORE
REL 151 SURVEY OF THE OLD TESTAMENT (3-0-3)
This course is an introduction to the content of the Old Testament with emphasis on the historical context and contemporary theological and cultural significance of the Old Testament. The student should have an understanding of the significance of the Old Testament writings upon completion of this course. CORE

REL 152 SURVEY OF THE NEW TESTAMENT (3-0-3)
This course surveys books of the New Testament with special attention focused on the historical and geographical setting. The student should have an understanding of the books of the New Testament and the cultural and historical events associated with these writings. CORE

## RENEWABLE ENERGY TECHNOLOGY

REN 110 BIO-FUELS I (2-2-3)
This course is designed to provide an introduction to the fundamentals of bio-based fuels. Emphasis is placed on handling and storage guidelines, basic chemistry of bio-fuels, production methods, and the social, environmental, and economic impacts of bio-fuels. Upon completion students should be able to demonstrate a general understanding of bio-fuels.

REN 111 BIO-ENERGY TECHNOLOGY (2-2-3)
This course provides an in-depth study of fuel cell technology, smart grid technology, electricity, biomass gasification and bio-fuels business models. Upon completion students should possess a practical knowledge of bio-energy technology and facility operation.

REN 210 BIO-FUELS ANALYTICS (2-2-3)
This course is designed to address quality control management during all phases of the bio-fuels production process. Topics include stock analysis, in-process quality monitoring, and standards compliance with national and international bio-fuels specifications. Upon completion students should be able to demonstrate safe and accurate laboratory practices as well as an understanding of various quality control techniques.

REN 211 BIOPROCESS PRACTICES (2-2-3)
This course provides a study of plant operations including various plant utility systems and detailed study of the varied plant environments in a bio-processing facility. Emphasis is placed on quality mindset and principles of validation through applications of monitoring procedures. Upon completion, students should be able to demonstrate the rigors of industry regulation and its necessity.

## SOCIOLOGY

SOC 200 INTRODUCTION TO SOCIOLOGY (3-0-3)
This course is an introduction to the vocabulary, concepts, and theory of sociological perspectives of human behavior. CORE

SOC 210 SOCIAL PROBLEMS (3-0-3)
PREREQUISITE: SOC 200
This course examines the social and cultural aspects, influences, incidences and characteristics of current social problems in light of sociological theory and research. CORE

SOC 247 MARRIAGE AND THE FAMILY (3-0-3)
PREREQUISITE: SOC 200
This course is a study of family structures and families in a modern society. It covers preparation for marriage, as well as sociological, psychological, biological, and financial factors relevant to success in marriage and family life.

## SPANISH

SPA 101 INTRODUCTORY SPANISH I (4-0-4)
This course provides an introduction to Spanish. Topics include the development of basic communication skills and the acquisition of basic knowledge of the cultures of Spanish-speaking areas. CORE

SPA 102 INTRODUCTORY SPANISH II (4-0-4)
PREREQUISITE: SPA 101 or equivalent.
This continuation course includes the development of basic communication skills and the acquisition of basic knowledge of the cultures of Spanish-speaking areas. CORE

SPA 201 INTERMEDIATE SPANISH I (3-0-3)
PREREQUISITE: SPA 102 or equivalent.
This course includes a review and further development of communication skills. Topics include readings of literary, historical, and/or cultural texts. CORE

SPA 202 INTERMEDIATE SPANISH II (3-0-3)
PREREQUISITE: SPA 201 or equivalent.
This continuation course includes a review and further development of communication skills. Topics include readings of literary, historical, and/or cultural texts. CORE

## SPEECH

SPC 103 ORAL COMMUNICATION SKILLS (3-0-3)
This course introduces the basic concepts of interpersonal communication and the oral communication skills necessary to interact with co-workers and customers, and to work effectively in teams. Topics include overcoming barriers to effective communication, effective listening, applying the principles of persuasion, utilizing basic dynamics of group discussion, conflict resolution, and positive communication patterns in the business setting. Upon completion, students should be able to demonstrate interpersonal communication skills, apply basic principles of group discussion, develop a businesslike personality, and effectively present themselves before co-workers and the public. NCA

SPH 106 FUNDAMENTALS OF ORAL COMMUNICATION (3-0-3)
PREREQUISITE: Grade of C or better in ENG 093 or placement score in ENG 101.
Fundamentals of Oral Communication is a performance course that includes the principles of human communication: intrapersonal, interpersonal, and public. It surveys current communication theory and provides practical application. CORE

SPH 107 FUNDAMENTALS OF PUBLIC SPEAKING (3-0-3)
PREREQUISITE: Grade of C or better in ENG 093 or placement score in ENG 101.
This course explores principles of audience and environment analysis as well as the actual planning, rehearsing and presenting of formal speeches to specific audiences. Historical foundations, communication theories and student performances are emphasized. CORE

SPH 111 SIGN LANGUAGE (1-3–0–1-3)
In this course, students are taught the basics of communication through sign language.

SPH 112 SIGN LANGUAGE (1-3–0–1-3)
In this course, students are taught to expand vocabulary and proficiency in sign language.

SPH 116 INTRO TO INTERPERSONAL COMMUNICATION (3-0-3)
This course is an introduction to the basic principles of interpersonal communication. CORE

SPH 206 ORAL INTERPRETATION (3-0-3)
This course is designed to help students develop specific skills in the analysis and oral interpretation of poetry, prose, and drama. It includes a study of the elements of oral communication such as imagery, structure, and dramatic timing.

## SURGICAL TECHNOLOGY

SUR 100 PRINCIPLES OF SURGICAL TECHNOLOGY (3-10-5)
PREREQUISITE: Admission to the program and advisor approval.
This course is an introduction to the field of surgical technology as a career. Emphasis is on the role of the surgical technologist, principles of asepsis, principles of patient care, surgical procedures, operative techniques, blood-borne pathogens, safety, pharmacology, and surgical instrumentation. Upon completion, the student should be able to demonstrate practical application of the basic principles and skills of the surgical technologist.

SUR 102 APPLIED SURGICAL TECHNIQUES (2-0-6-4)
PREREQUISITE: SUR 100
This course is the application of principles of asepsis and the role of the surgical technologist. Emphasis is placed on creating and maintaining a sterile environment, and applying skills of interoperative procedures. Upon completion of this course, the student should be able to participate in mock surgical procedures.

SUR 103 SURGICAL PROCEDURES (3-6-0-5)
PREREQUISITE: SUR 102
This course is a study of surgical procedures as they relate to anatomy, pathology, specialty equipment, and team responsibility. Patient safety is emphasized and medications used in surgery are discussed. Upon completion of the course, the student should be able to participate in surgical procedures in the operating room.

SUR 104 SURGICAL PRACTICUM I (0-0-20-4)
PREREQUISITE: SUR 103
This course is the application of perioperative principles in the perioperative setting. Emphasis is placed on application of the surgical technologist. Upon completion of the course, the student should be able to participate in the surgical technologist role.

SUR 105 SURGICAL PRACTICUM II (1-0-20-5)
PREREQUISITE: SUR 104; CO-REQUISITE: SUR 106
This clinical experience allows the student to practice in the health care environment using entry level skills attained in previous classroom laboratory and clinical instruction. In addition to clinical skills, emphasis is placed on specialty surgical procedures, the study of trends, professional and interpersonal skills in the health care setting, and case review. Upon completion of this course, the student should be able to apply concepts of surgical technology to student levels.

SUR 106 ROLE TRANSITION IN SURGICAL TECHNOLOGY (1-0-0-1)
CO-REQUISITE: SUR 105
This course is designed to provide specialized instruction for the student preparing to transition into the field of Surgical Technology. Emphasis is on review of content specific to the practice of surgical technology and preparation for the NBSTSA certification examination. Upon completion of this course, the student will be able to demonstrate readiness to take the certification examination.

SUR 107 SURGICAL ANATOMY & PHYSIOLOGY (3-0-0-3)
PREREQUISITE: Admission to the program and/or as required by the SUR Department.
This course is an overview of surgical anatomy and physiology. Emphasis is placed on the organizational structure of the body, organ systems, relevant surgical pathophysiology, and related medical terminology. Upon completion, the student should be able to apply knowledge of anatomy in the clinical environment.

SUR 208 SPECIAL TOPICS IN SURGICAL TECHNOLOGY (0-0-3-1)
PREREQUISITE: Admission to the program and/or as required by the Department.
This course is designed to provide specialized instruction in selected topics in the field of Surgical Technology. Emphasis is on content specific principles based on student needs.

## THEATER ARTS

THR 120 THEATER APPRECIATION (3-0-3)
This course is designed to increase appreciation of contemporary theater. Emphasis is given to the theater as an art form through the study of history and theory of drama and the contributions of modern media. Emphasis of playwright, actor, director, designer and technician to modern media. Attendance at theater production may be required. CORE

## TRUCK DRIVER TRAINING

TRK 111 BASIC VEHICLE OPERATION (3-2-4)
COREQUISITE: TRK 112, TRK 113.
This course introduces students to the fundamentals of becoming a professional commercial motor vehicle driver. Topics include orientation, control systems, vehicle inspections and reporting, basic control, shifting, backing, coupling and uncoupling, proficiency development, and special rigs. Upon completion, the student should demonstrate proficiency in skill field tasks and pre-trip inspections to Commercial Drivers License standards. NDC, CORE

TRK 112 SAFE OPERATING PRACTICES (2-3-3)
COREQUISITE: TRK 111, TRK 113.
This course offers proper defensive driving techniques applicable to the commercial motor vehicle driver and involves the interaction between the student/vehicle and the highway traffic environment. Topics include visual search, communication, speed and space management, night operation, extreme driving conditions, and proficiency development. Upon completion, the student should demonstrate basic operating skills that ensure safety of the driver and other vehicle operators to Commercial Drivers License standards. NDC, CORE

TRK 113 NON-VEHICLE ACTIVITIES (1-2-2)
COREQUISITE: TRK 111, TRK 112.
This course focuses on activities not directly related to the vehicle itself, but that are related to the potential job performance of the commercial motor vehicle driver. Topics include handling cargo, cargo documentation, hours of service requirements, accident procedures, personal health and safety, trip planning, employability skills, and public and employer relations. Upon completion, the student will demonstrate performance of these activities to Commercial Drivers License standards to ensure safety to the driver, vehicle, cargo, and other motorists. NDC, CORE

## VEHICLE TECHNOLOGY AND REPAIR

VTR 112 ELECTRICAL FUNDAMENTALS (1-4-3)
This course introduces the principles of basic Electrical/Electronic concepts and fundamentals. Topics include basic DC theory, types of diagnostic equipment, circuit protection, wire repair, use of wiring diagrams, airbag modules, and impact sensors. Upon completion, student should be able to identify components, test systems, and repair minor electrical problems according to manufacturer's literature. CORE

VTR 121 BRAKING SYSTEMS (1-4-3)
This course covers the theory and repair of braking systems and various other mechanical repairs. Emphasis is placed on the practical application of brakes. Upon completion, students should be able to troubleshoot, adjust and repair braking system. CORE

VTR 122 STEERING AND SUSPENSION (1-4-3)
This course introduces students to the various types of suspension and steering systems. Emphasis is placed on the practical application of steering and suspension. Upon completion, students should be able to troubleshoot, adjust, and repair suspension and steering components. CORE

VTR 133 HEATING AND AIR CONDITIONING (1-4-3)
This course provides basic instruction in theory, operation, and repair of heating and air conditioning/refrigeration systems. Topics include operation theory, safety, maintenance, recycling and recovery procedures, recharging procedures, troubleshooting procedures, refrigerant leaks, and system repairs. Emphasis is placed on the understanding and repair air conditioning and heating systems, including but not limited to air management, electrical and vacuum controls, refrigerant recovery, and component replacement. CORE

## WELDING

WDT 108 SMAW FILLET/OFC (2-3-3)
This course provides the student with instruction on safety practices and terminology in the Shielded Metal Arc Welding (SMAW) process. Emphasis is placed on safety, welding terminology, equipment identification, set-up and operation, and related information in the SMAW process. This course also covers the rules of basic safety and identification of shop equipment and provides the student with the skills and knowledge necessary for the safe operation of oxy-fuel cutting. CORE

WDT 109 SMAW FILLET/PAC/CAC (2-3-3)
This course provides the student with instruction on safety practices and terminology in the Shielded Metal Arc Welding (SMAW) process. Emphasis is placed on safety, welding terminology, equipment identification, set-up and operation, and related information in the SMAW process. This course also covers the rules of basic safety and identification of shop equipment and provides the student with the skills and knowledge necessary for the safe operation of carbon arc cutting and plasma arc cutting. CORE

WDT 119 GAS METAL ARC/FLUX CORED ARC WELDING (2-3-3)
PREREQUISITE: WDT 109 or advisor approval.
This course introduces the student to the gas metal arc and flux cored arc welding process. Emphasis is placed on safe operation practices, handling and storage of compressed gasses, process principles, component identification, various welding techniques and base and filler metal identification. CORE

WDT 120 SHIELDED METAL ARC WELDING GROOVE (2-3-3)
COREQUISITE: WDT 125
This course provides the student with instruction on joint design, joint preparation, and fit-up of groove welds in accordance with applicable welding codes. Emphasis is placed on safe operation, joint design, joint preparation, and fit-up. Upon completion, students should be able to identify the proper joint design, joint preparation and fit-up of groove welds in accordance with applicable welding codes. CORE

WDT 122 SMAW FILLET/OFC LAB (0-6-3)
This course is designed to introduce the student to the proper set-up and operation of the shielded metal arc welding equipment. Emphasis is placed on striking and controlling the arc, and proper fit-up of fillet joints. This course is also designed to instruct students in the safe operation of oxy-fuel cutting. Upon completion, students should be able to make fillet welds in all positions using electrodes in the F-3 groups in accordance with applicable welding code and be able to safely operate oxy-fuel equipment and perform those operations as per the applicable welding code. CORE

WDT 123 SMAW FILLET/PAC/CAC LAB (0-6-3)
This course is designed to introduce the student to the proper set-up and operation of the shielded metal arc welding equipment. Emphasis is placed on striking and controlling the arc, and proper fit-up of fillet joints. This course is also designed to instruct students in the safe operation of plasma arc and carbon arc cutting. Upon completion, students should be able to make fillet welds in all positions using electrodes in the F-4 groups in accordance with applicable welding code and be able to safely operate plasma arc and carbon arc equipment and perform those operations as per the applicable welding code. CORE

WDT 124 GAS METAL ARC/FLUX CORED ARC WELDING LAB (0-6-3)
COREQUISITE: WDT 119
This course provides instruction and demonstration using the various transfer methods and techniques to gas metal arc and flux cored arc welds. Topics included are safety, equipment set-up, joint design and preparation, and gases. CORE

WDT 125 SHIELDED METAL ARC WELDING GROOVE LAB (0-6-3)
PREREQUISITE: WDT 109 or advisor approval.
COREQUISITE: WDT 120
This course provides instruction and demonstrations in the shielded metal arc welding process on carbon steel plate with various size F-3 and F-4 group electrodes in all positions. Emphasis is placed on welding groove joints and using various F-3 and F-4 group electrodes in all positions. Upon completion, the student should be able to make visually acceptable groove weld joints in accordance with applicable welding codes. CORE

WDT 155 GTAW CARBON PIPE LAB (0-6-3)
This course is designed to provide the student with the skills in welding carbon steel pipe with gas tungsten arc welding techniques in various pipe weld positions. Upon completion, students should be able to perform gas tungsten arc welding on carbon steel pipe with the prescribed filler metals in various positions in accordance with the applicable code.

WDT 156 GTAW STAINLESS PIPE LAB (0-6-3)
This course is designed to provide the student with the skills in welding stainless steel pipe with gas tungsten arc welding techniques in various pipe weld positions. Upon completion, students should be able to perform gas tungsten arc welding on stainless steel pipe with the prescribed filler metals in various positions in accordance with the applicable code.

WDT 157 CONSUMABLE WELDING PROCESSES (1-6-3)
This course provides instruction and demonstration with the consumable welding processes to produce groove and fillet welds in all positions, according to applicable welding codes. Topics include safe operating practices, equipment identification, equipment set-up, correct selection of electrode, current/polarity, shielding gas and base metals.

WDT 158 CONSUMABLE WELDING PROCESSES LAB (0-6-3)
This course provides instruction and demonstration with the consumable welding processes to produce groove and fillet welds in all positions, according to applicable welding codes. Topics include safe operating practices, equipment identification, equipment set-up, correct selection of electrode, current/polarity, shielding gas and base metals. Upon completion, the student should be able to produce groove and fillet welds using consumable welding processes according to AWS Codes and standards. This course supports CIP code 48.0508.

WDT 160 ROBOTICS LAB I (1-6-3)
This course is the practical application of robotics theory. Students will complete machine origins, robotic programming, robotic welding parameters, link programs to create jobs, and allocate a weave start.

WDT 166 FLUX CORE ARC WELDING (FCAW) (2-3-3)
This course provides instruction and demonstration with the flux core arc welding process to produce groove and fillet welds in all positions, according to applicable welding codes. Topics include safe operating practices, equipment identification, equipment set-up, correct selection of filler metals, current/polarity, shielding gas and base metals. Upon completion, the student should be able to produce groove and fillet welds using the FCAW welding process, according to AWS Codes and Standards. This course supports CIP code 48.0508.

WDT 167 FLUX CORE ARC WELDING LAB (0-6-3)
This course provides instruction and demonstration with the flux core arc welding process to produce groove and fillet welds in all positions, according to applicable welding codes. Topics include safe operating practices, equipment identification, equipment set-up, correct selection of filler metals, current/polarity, shielding gas and base metals. Upon completion, the student should be able to produce groove and fillet welds using the FCAW welding process, according to AWS Codes and Standards.

WDT 180 SPECIAL TOPICS (1-4-3)
This course allows the student to plan, execute, and present results of individual projects in welding. Emphasis is placed on enhancing skill attainment in the welding field. The student will be able to demonstrate and apply competencies identified and agreed upon between the student and instructor.

WDT 181 SPECIAL TOPICS LAB (0-6-3)
This course provides specialized instruction in various areas related to the welding industry. Emphasis is placed on meeting students needs.

WDT 182 SPECIAL TOPICS (1-4-3)
This course allows the student to plan, execute, and present results of individual projects in welding. Emphasis is placed on enhancing skill attainment in the welding field. The student will be able to demonstrate and apply competencies identified and agreed upon between the student and instructor.

WDT 183 SPECIAL TOPICS (1-2-2)
This course allows the student to plan, execute, and present results of individual projects in welding. Emphasis is placed on enhancing skill attainment in the welding field. The student will be able to demonstrate and apply competencies identified and agreed upon between the student and instructor.

WDT 184 SPECIAL TOPICS (0-2-1)
This course allows the student to plan, execute, and present results of individual projects in welding. Emphasis is placed on enhancing skill attainment in the welding field. The student will be able to demonstrate and apply competencies identified and agreed upon between the student and instructor.
WDT 193 CO-OP (0-15-3)
These courses constitute a series wherein the student works on a part-time basis in a job directly related to welding. In these courses the employer evaluates the student's productivity and the student submits a descriptive report of his work experiences. Upon completion, the student will demonstrate skills learned in an employment setting.

WDT 217 SMAW CARBON PIPE (1-4-3)
This course introduces the student to the practices and procedures of welding carbon steel pipe using the shielded metal arc weld (SMAW) process. Emphasis is placed on pipe positions, electrode selection, joint geometry, joint preparation and fit-up. Upon completion, students should be able to identify pipe positions, electrodes, proper joint geometry, joint preparation, and fit-up in accordance with applicable codes.

WDT 218 CERTIFICATION (1-6-3)
This course is designed to provide the student with the knowledge needed to perform welds using the prescribed welding process. Emphasis is placed on the welding test joints in accordance with the prescribed welding code. Upon completion, students should be able to pass and industry standard welding test in accordance with various applicable welding code requirements.

WDT 219 WELDING INSPECTION & TESTING (3-0-3)
This course provides the student with inspection skills and knowledge necessary to evaluate welded joints and apply quality control measures as needed. Emphasis is placed on interpreting welding codes, welding procedures, and visual inspection methods. Upon completion, students should be able to visually identify visual acceptable weldments as prescribed by the code or welding specification report.

WDT 221 PIPEFITTING AND FABRICATION (1-6-3)
This course provides the student with skills and practices necessary for fabricating pipe plans using pipe and fittings. Emphasis is placed on various pipe fittings to include various degree angles. Upon completion, students should be able to fit various pipe fittings, and cut and fabricate tees, and assorted angles.

WDT 223 BLUEPRINT READING FOR FABRICATION (1-4-3)
This course provides a student with advanced skills in identifying and interpreting lines, views, dimensions, notes, bill of materials, and the use of tools of the trade. Emphasis is placed on figuring dimensional tolerances, layout and fitting of different component parts. Upon course completion, a student should be able to interpret, layout, and fabricate from blueprints to given tolerances.

WDT 229 BOILER TUBE (1-4-3)
This course is designed to provide the student with the practices and procedures of welding boiler tubes using the gas tungsten arc and shielded metal arc welding process to the applicable code. Emphasis is placed on tube fit-up, tube welding technique, and code requirements. Upon completion, students should be able to identify code requirements and tube welding technique.

WDT 257 SMAW CARBON PIPE LAB (0-6-3)
This course is designed to provide the student with the skills in welding carbon steel pipe with shielded metal arc welding techniques in various pipe welding positions. Upon completion, students should be able to perform shielded metal arc welding on carbon steel pipe with the prescribed electrodes in various positions in accordance with the applicable codes.

WDT 258 CERTIFICATION LAB (0-6-3)
Prerequisite or Co-requisite: WDT 218 or advisor approval.
This course is designed to provide the student with the skills needed to perform welds using the prescribed welding process. Emphasis is placed on the welding test joints in accordance with the prescribed welding code. Upon completion, students should be able to pass and industry standard welding test in accordance with various welding code requirements.

WDT 269 BOILER TUBE LAB (0-6-3)
This course is designed to provide the student with the skills in welding boiler tubes using the gas tungsten arc and shielded metal arc welding process using filler metals in the F6 and F4 groups to applicable code. Emphasis is placed on welding boiler tubes using the gas tungsten arc and shielded metal arc welding process in the 2G and 6G positions in accordance with the applicable code. Upon completion, students should be able to perform gas tungsten arc and shielded metal arc welding on boiler tubes with the prescribed filler metals in the 2G and 6G positions to the applicable code.

WDT 280 SPECIAL TOPICS (0-9-3)
This course provides specialized instruction in various areas related to the welding industry. Emphasis is placed on meeting students' needs.

WDT 281 SPECIAL TOPICS IN WELDING TECHNOLOGY (0-9-3)
This course provides specialized instruction in various areas related to the welding industry. Emphasis is placed on meeting students' needs.
WDT 282 SPECIAL TOPICS (0-9-3)
This course provides specialized instruction in various areas related to the welding industry. Emphasis is placed on meeting students' needs.

WDT 291 CO-OP (0-15-3)
These courses constitute a series wherein the student works on a part-time basis in a job directly related to welding. In these courses the employer evaluates the student's productivity and the student submits a descriptive report of his work experiences. Upon completion, the student will demonstrate skills learned in an employment setting.

WDT 292 CO-OP (0-15-3)
These courses constitute a series wherein the student works on a part-time basis in a job directly related to welding. In these courses the employer evaluates the student's productivity and the student submits a descriptive report of his work experiences. Upon completion, the student will demonstrate skills learned in an employment setting.

WDT 293 CO-OP (0-5-1)
These courses constitute a series wherein the student works on a part-time basis in a job directly related to welding. In these courses the employer evaluates the student's productivity and the student submits a descriptive report of his work experiences. Upon completion, the student will demonstrate skills learned in an employment setting.

WDT 294 CO-OP (0-10-2)
These courses constitute a series wherein the student works on a part-time basis in a job directly related to welding. In these courses the employer evaluates the student's productivity and the student submits a descriptive report of his work experiences. Upon completion, the student will demonstrate skills learned in an employment setting.

## WORKPLACE SKILLS

WKO 110 NCCER CORE (2-1-3)
This course is designed to provide students iwth knowledge and skills related to multi-craft technicians in a variety of fields. Information in this course is based on the National Center for Construction Education and Research (NCCER) core curriculum and prepares students to test for the NCCER credential.