

**AIR CONDITIONING AND REFRIGERATION (ACR)**

**ACR 111 REFRIGERATION PRINCIPLES (2T, 4M) 3 credits**  
**FORMERLY: ACR 101**  
 This course emphasizes the fundamental principles for air conditioning and refrigeration. Instruction is provided in the theory and principles of refrigeration heat transfer, refrigeration system components, the mechanical cycle of operation, and refrigeration characteristics. Upon completion, students should understand the functions of major systems components, terminology, heat transfer, safety, and the use and care of tools and equipment.

**ACR 112 HVACR SERVICE PROCEDURES (1T, 5M) 3 credits**  
**FORMERLY: ACR 120**  
 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 (1T, 2E, 3M) 3 credits**  
 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 understand related terminology, be able to identify ACR pipe and tubing, and various fittings.

**ACR 115 HEATING SYSTEMS I (2T, 4E, 6M) 6 credits**  
**FORMERLY: ACR 211**  
 This course covers the fundamentals of heating systems. Emphasis is placed on components, operations general service procedures, and basic installation procedures. Upon completion, students should be able to install and service gas and electric furnaces.

**ACR 121 PRINCIPLES OF ELECTRICITY FOR HVACR (2T, 4M) 3 credits**  
 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 HVACR circuits and circuit components.

**ACR 122 HVACR ELECTRICAL CIRCUITS (1T, 5M) 3 credits**  
**FORMERLY: ACR 133**  
 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.

**ACR 123 HVACR ELECTRICAL COMPONENTS (1T, 5M) 3 credits**  
**FORMERLY: ACR 212**  
**PREREQUISITE: ACR 121**  
 This course introduces students to electrical components and controls. Emphasis is placed on the operations of motors, relays, contractors, starters, and other HVAC controls. Upon completion, students should be able to understand motor theory and control functions in HVACR equipment.

**ACR 125 ADVANCED HEAT PUMP SYSTEMS (2T, 4E, 6M) 6 credits**  
**PREREQUISITE: ACR 123**  
 This course is an in-depth study of the theory and application of heat pump systems. Topics include reverse cycle refrigeration, four-way valve operation, industry codes, system components and troubleshooting. Upon completion, students should be able to install and service heat pumps.

**ACR 126 COMMERCIAL HEATING SYSTEMS (1T, 5M) 3 credits**  
**FORMERLY: ACR 213**  
**PREREQUISITE: ACR 115**  
 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 130 COMPUTER ASSISTED HVAC TROUBLESHOOTING (2E, 3M) 1 credit**  
**FORMERLY: ACR 232**  
 This course focuses on troubleshooting procedures. Emphasis is placed on the proper use of test equipment and machine/electrical malfunctions. Upon completion, students should be able to diagnose and repair service problems in HVAC equipment.

**ACR 132 RESIDENTIAL AIR CONDITIONING (1T, 5M) 3 credits**  
**FORMERLY: ACR 131**  
**PREREQUISITE: ACR 111 (Formerly ACR 101)**  
 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.

<p><b>ACR 133</b>      <b>DOMESTIC REFRIGERATION</b> (1T, 2E, 3M)      <b>3 credits</b> <b>PREREQUISITE: ACR 111 (Formerly ACR 101)</b> This course covers domestic refrigerators and freezers. Emphasis is placed on operation, maintenance, and repair of domestic refrigerators. Upon completion, students should be able to service and repair home refrigerators and freezers. <b>(Taught on Demand)</b></p>	<p><b>ACR 202</b>      <b>SPECIAL REFRIGERATION SYSTEMS</b> (1T, 2E, 3M)      <b>3 credits</b> <b>FORMERLY: ACR 231</b> <b>PREREQUISITE: ACR 111 (Formerly ACR 101)</b> This course is designed to give students the basic knowledge of a variety of commercial refrigeration systems. Topics include expandable refrigeration evaporator systems, combination spray and compressor system, open cycle ammonia, CO2 pellets, vortex tubes, reach in coolers, and soft serve ice cream machines. Upon completion, students should be able to perform general troubleshooting and maintenance on various commercial refrigeration systems.</p>	<p>calculation, psychometrics, installation procedures, and air distribution. Upon completion, students should be prepared to take the contractors exam. <b>(Taught on Demand)</b></p>
<p><b>ACR 134</b>      <b>ICE MACHINES (1T, 2E, 3M)</b>      <b>3 credits</b> 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, students should be able to install, service and repair commercial ice machines. <b>(Taught on Demand)</b></p>	<p><b>ACR 203</b>      <b>COMMERCIAL REFRIGERATION</b> (1T, 2E, 3M)      <b>3 credits</b> <b>PREREQUISITE: ACR 111 (Formerly ACR 101)</b> 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.</p>	<p><b>ACR 203</b>      <b>COMMERCIAL REFRIGERATION</b> (1T, 2E, 3M)      <b>3 credits</b> <b>PREREQUISITE: ACR 111 (Formerly ACR 101)</b> 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.</p>
<p><b>ACR 139</b>      <b>AUTOMOTIVE AIR CONDITIONING</b> (1T, 2E, 3M)      <b>3 credits</b> <b>FORMERLY: ACR 223</b> This course introduces students to the fundamentals of the automotive air conditioning systems. Emphasis is placed on service, diagnostics, repair procedures and the recovery and recycling of refrigerants. Upon completion, students should be able to service and repair automotive air conditioning systems.</p>	<p><b>ACR 204</b>      <b>COMMERCIAL AIR CONDITIONING</b> (1T, 5M)      <b>3 credits</b> <b>FORMERLY: ACR 213</b> <b>PREREQUISITE: ACR 111 (Formerly ACR 101)</b> This course focuses on commercial air conditioning systems. Topics include maintenance, repair, and troubleshooting. Upon course completion, students should be able to service and repair commercial air conditioning systems.</p>	<p><b>ACR 204</b>      <b>COMMERCIAL AIR CONDITIONING</b> (1T, 5M)      <b>3 credits</b> <b>FORMERLY: ACR 213</b> <b>PREREQUISITE: ACR 111 (Formerly ACR 101)</b> This course focuses on commercial air conditioning systems. Topics include maintenance, repair, and troubleshooting. Upon course completion, students should be able to service and repair commercial air conditioning systems.</p>
<p><b>ACR 144</b>      <b>BASIC DRAWING AND BLUEPRINT READING IN HVAC (3T)</b>      <b>3 credits</b> 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. <b>(Taught on Demand)</b></p>	<p><b>ACR 205</b>      <b>SYSTEM SIZING AND AIR DISTRIBUTION</b> (1T, 5M)      <b>3 credits</b> <b>FORMERLY: ACR 221 and ACR 222</b> This course provides instruction in the load calculation of a structure and system sizing. Topics of instruction include heat loss, heat gain, equipment and air distribution sizing, and factors making acceptable indoor air quality. Upon course completion, students should be able to calculate system requirements.</p>	<p><b>ACR 205</b>      <b>SYSTEM SIZING AND AIR DISTRIBUTION</b> (1T, 5M)      <b>3 credits</b> <b>FORMERLY: ACR 221 and ACR 222</b> This course provides instruction in the load calculation of a structure and system sizing. Topics of instruction include heat loss, heat gain, equipment and air distribution sizing, and factors making acceptable indoor air quality. Upon course completion, students should be able to calculate system requirements.</p>
<p><b>ACR 147</b>      <b>REFRIGERATION TRANSITION AND RECOVERY (3T)</b>      <b>3 credits</b> This course is EPA-approved and covers material relating to the requirements necessary for types I, II, III and universal certification. The EPA certification exam is administered at the end of the course. Upon completion, students should be able to pass the EPA refrigerant certification exam. <b>(Taught on Demand)</b></p>	<p><b>ACR 206</b>      <b>SYSTEM TROUBLESHOOTING</b> (2T, 4M)      <b>3 credits</b> <b>FORMERLY: ACR 233</b> This course introduces students to various HVAC troubleshooting techniques. Emphasis is placed on mechanical and electrical problems, heat pump service, air conditioning service, and problem analysis. Upon course completion, students should be able to perform various troubleshooting techniques on heating and air conditioning systems.</p>	<p><b>ACR 206</b>      <b>SYSTEM TROUBLESHOOTING</b> (2T, 4M)      <b>3 credits</b> <b>FORMERLY: ACR 233</b> This course introduces students to various HVAC troubleshooting techniques. Emphasis is placed on mechanical and electrical problems, heat pump service, air conditioning service, and problem analysis. Upon course completion, students should be able to perform various troubleshooting techniques on heating and air conditioning systems.</p>
<p><b>ACR 192</b>      <b>HVAC APPRENTICESHIP/INTERNSHIP (15M)</b>      <b>3 credits</b> This course is designed to provide basic hands-on experiences in the workplace. The student is provided with a training plan developed by the employer and instructor working together to guide the learning experience. Upon course completion, students should be able to work independently and apply related skills and knowledge. <b>(Taught on Demand)</b></p>	<p><b>ACR 200</b>      <b>REVIEW FOR CONTRACTORS EXAM</b> (1T, 5M)      <b>3 credits</b> This course prepares students to take the State Certification Examination. Emphasis is placed on all pertinent codes, piping procedures, duct design, load</p>	<p><b>ACR 200</b>      <b>REVIEW FOR CONTRACTORS EXAM</b> (1T, 5M)      <b>3 credits</b> This course prepares students to take the State Certification Examination. Emphasis is placed on all pertinent codes, piping procedures, duct design, load</p>

**Course Descriptions**

**AEROSPACE TECHNOLOGY (ARS)**

**ARS 100 AEROSPACE PRINT READING, GD & T, PRECISION MEASURING INSTRUMENTS (3T) 3 credits**  
This course is designed to introduce the basic principles of print reading and design, including the English and Metric System; precision measuring equipment; Geometric Dimensioning and Tolerancing dealing with Aerospace design and tolerance fundamentals. Print reading topics include multi-view machine, welding, instrumentation, process, assembly drawings and engineering change order procedures. GD & T topics covered include symbols, terms, tolerance data frames and conversion. The precision measuring tools using hands on experience include small hand precision gages, combination square sets, dial & digital calipers, micrometer calipers, all type indicators, depth gages, vernier scale instruments, digital micro-check and ultra-sonic gages.

**ARS 101 FUNDAMENTALS OF AEROSPACE MANUFACTURING (3T) 3 credits**  
This course will provide an in-depth study of several modern processes and materials that are used in fabricating high performance, lightweight, and reliable structures for aerospace assemblies. Several processes will be reviewed in detail. The processes will be those currently used in Aerospace and predicted for future use. Emphasis will be placed on process evaluation techniques that can be extrapolated to other areas.

**ARS 104 SAFETY IN A MANUFACTURING ENVIRONMENT (3T) 3 credits**  
This course is an introduction to general issues, concepts, procedures, and safety standards found in an aerospace industrial environment. This safety course is to make the Aerospace Technician aware of their changing work environment and attempt to reduce the number of industrial accidents. This course emphasizes many safety topics including general industry safety rules, personnel protective equipment, electrical & machine safety, respirators, welding & coatings safety, fall protection & elevated platforms, crane & rigging operation, forklift and tug safety, HazCom policies and MSDS documentation.

**ARS 105 AEROSPACE METALLURGY AND MATERIALS (3T) 3 credits**  
This course will provide the student with an ability to make informed decisions in processing materials used in aerospace manufacturing, fabrication and assembly. This course will also provide an awareness of the material requirements of structures fabricated to perform in a non-terrestrial environment and an introduction to the vocabulary commonly used in Aerospace fabrication facilities.

**ARS 126 AEROSPACE MACHINING FUNDAMENTALS (2T, 3M) 3 credits**  
**COREQUISITE: ARS 100**  
This course is an introduction to general machining issues, concepts, procedures, and safety standards

found in an aerospace industrial environment. This introduction to Aerospace Machining Fundamentals is intended to indoctrinate the Aerospace Technician in basic skills needed to operate and to perform machining functions safely and efficiently in an aerospace facility. The Aerospace Technician will be introduced to basic manual as well as introductory level CNC programming and CNC manufacturing skills to build a firm foundation as an Aerospace Machining and Fabrication Technician. Some of the study and practical experience topics are bench work, speeds and feeds, tooling applications, set-up, machine control & operations, CNC basic operations, G & M codes, tool presetting and CNC machine capabilities.

**ARS 127 ADVANCED AEROSPACE MACHINING (2T, 3M) 3 credits**  
**PREREQUISITE: ARS 126**  
**COREQUISITE: ARS 100**

This course will introduce advanced principles of aerospace machining. It is designed to build on general machining issues, concepts, procedures, and safety standards learned in the course Aerospace Machining Fundamentals. This course is intended to indoctrinate the Aerospace Technician in advanced skills needed to safely and efficiently operate machining equipment in an Aerospace Facility and other high-tech machining industries and industrial environments. This course emphasizes CNC programming, tooling and work-holding devices, organization and inventory tooling practices and work skills needed in an aerospace industrial environment.

**ARS 128 CNC PROGRAMMING (2T, 3M) 3 credits**  
**COREQUISITE: ARS 100**

This course is an introduction to general CNC programming concepts, procedures and techniques found in an aerospace industrial machining and fabricating environment. This course will train the Aerospace Technician to read, write and use the G and M code programming language to accomplish machining and fabricating hardware using state of the art CNC equipment. This course also introduces the technician to CadCam system programming found in the aerospace industry. These Cad-Cam programming skills will be used extensively through the entire aerospace machining and fabrication curriculum path. Some of the programming topics will include 3 axes mill, CNC lathe programming and applying tool path and cutter compensations.

**ARS 129 AEROSPACE BRAKE-FORMING OPERATIONS (2T, 3M) 3 credits**  
**COREQUISITE: ARS 100**

This course is designed to educate individuals in brake forming operations, issues, concepts, procedures, and safety standards found in an Aerospace industrial environment. Brake Forming Operations is intended to supply the Aerospace Technician with advanced skills needed to operate, and to perform bending and forming operations safely and efficiently in an Aerospace facility. The Aerospace Technician will be introduced to sheet metal bend programming, conversational CNC operational and manufacturing skills. This will allow the Aerospace Brake Forming

Technician to become diversified in an Aerospace manufacturing environment and other high-tech industries involved in brake forming. The study includes practical experience in brake safety, tooling, maintenance, operations, press tooling applications dies, multiple set-ups, machine control & operations, slip rolling, conversational CNC control operations, generating programs, calculating set and spring back, materials and forming capabilities and bump forming.

**ARS 151 WELDING PRINCIPLES THEORY AND SYMBOLS (3T) 3 credits**  
**COREQUISITE: ARS 100**  
A beginning study of Aerospace welding processes with emphasis on equipment, gases, electric current, tooling, design, material types and welding symbols. A limited amount of manual welding is anticipated. Analysis of weldments is expected.

**ARS 152 ORBITAL TUBE WELDING (2T, 3M) 3 credits**  
**COREQUISITE: ARS 100**  
This course is a study in programmable orbital tube welding setup methods, programming methods, and safe operation of welders and tube preparation machinery. This process is a high tech application of automated TIG welding on small thin walled tubing.

**ARS 153 GAS TUNGSTEN ARC AND PLASMA WELDING AND LAB (3T, 2E) 4 credits**  
**COREQUISITE: ARS 100**  
A study of the strengths and limitations of Gas Tungsten Arc Welding (GTAW) and Plasma Arc Welding (PAW) will be made. Equipment, shielding gases, arc characteristics, filler metals, and base material will be studied. Manual welding procedures will be taught. Each student will receive a certificate stating the level of manual welding achievement.

**ARS 176 AEROSPACE ELECTRICAL/ELECTRONIC ASSEMBLY (2T, 2E) 3 credits**  
**COREQUISITE: ARS 100**  
This course is a study in the mechanics of electrical/electronic assembly used in aerospace and related manufacturing. This course will prepare the technician for the hands on part of electrical/electronic assembly, and includes basic electricity, wire types, wire gages, wire stripping methods, crimp tools, electrical connectors, electrical torquing, soldering techniques, wire harness manufacturing, and wire harness installation.

**ARS 178 AEROSPACE MECHANICAL ASSEMBLY (2T, 2E) 3 credits**  
**COREQUISITE: ARS 100**  
This course is a study of mechanical assembly processes applied in aerospace and related manufacturing industries. Topics include safety, drilling techniques, fastener installation, and related attachments.

**ARS 202 PROCESS CONTROL AND QUALITY MANUFACTURING (3T) 3 credits**  
This course serves as an introduction to the basic principles of Quality management and Statistical Process Control (SPC). It inculcates the student with

the concept of Lean Manufacturing reinforced with SPC applications. Objectives for students successfully completing the course are: (1) Practice the knowledge and skills to successfully apply SPC using various quality tools with the goal of improving product quality. (2) Practice the knowledge and skills needed for decision making and controlling manufacturing resources with the goal of improving efficiency and cost effectiveness. Additionally, this course is designed to enhance students' successful linkage to future certification in QA/AC.

**ARS 203 ADVANCED AEROSPACE MANUFACTURING (3T) 3 credits**  
**PREREQUISITE: ARS 101**  
The course will provide the student with an awareness of manufacturing processes and the knowledge of how to evaluate processes and materials for manufacturing stability, cost effectiveness, and inherent quality. The student will become familiar with methods to find additional technical information.

**ARS 226 HEMI-MILLING MACHINING (2T, 3M) 3 credits**  
**PREREQUISITE: ARS 126, ARS 127, ARS 128, ARS 227**  
**COREQUISITE: ARS 100**  
This advanced course is an introduction to hemi-milling operations, machining issues, concepts, procedures, and safety standards found in an Aerospace industrial environment. This course in Aerospace hemi-milling operations is intended to indoctrinate the Aerospace Technician in advanced skills needed to operate, and to perform Hemi and gantry mills safely and efficiently in an Aerospace facility. Some of the course study and practical experience include tooling and fixturing, CNC 5 axis programming, vector and polar coordinate drilling and 5 axis ISO grid operations and manipulation of multi-axis milling and drilling heads.

**ARS 227 SKIN MILLING (2T, 3M) 3 credits**  
**PREREQUISITE: ARS 126, ARS 127, ARS 128**  
**COREQUISITE: ARS 100**  
This advanced course is an introduction to skin milling operations, machining issues, concepts, procedures, and safety standards found in an aerospace industrial environment. This course in aerospace skin milling operations is intended to indoctrinate the Aerospace Technician in advanced skills needed to operate, and to perform skin and gantry mills safely and efficiently in an aerospace facility. Some of the course study and practical experience topics are surface prep, material selection, tool balancing and gauging, vacuum lift and chuck operating procedures, thread hobbing and ISO grid operations and manipulation of machine control units.

**ARS 228 VERTICAL TURRET LATHES (2T, 3M) 3 credits**  
**PREREQUISITE: ARS 126, ARS 127, ARS 128**  
**COREQUISITE: ARS 100**  
This advanced course is an introduction to vertical turret lathe operations, machining issues, concepts, pro-

**Course Descriptions**

**COURSE DESCRIPTIONS**

	cedures, and safety standards found in an aerospace industrial environment. This course in aerospace vertical turret Lathes operations is intended to indoctrinate the Aerospace Technician in advanced skills needed to operate, and to perform Vertical Turret Lathes safely and efficiently in an aerospace facility. Some of the course study and practical experience include lathe tooling, chucking and fixturing, CNC lathe programming, turning and threading operations, boring and facing and manipulation of FANUC machine control units.		materials for apply coatings by thermal, pneumatic and chemical means will be studied. Process analysis and final product acceptance requirements will be evaluated.
ARS 229	<b>AEROSPACE INSPECTION PROCESSES (2T, 3M) 3 credits</b> <b>COREQUISITE: ARS 100</b> This course is an advanced class involving aerospace inspection processes, concepts, procedures, and safety standards found in an aerospace industrial inspection environment. This course in aerospace inspection processes is intended to indoctrinate the Aerospace Technician in advanced inspection skills needed to operate, and to perform safely and efficiently in an aerospace facility. Inspection topics emphasized are vernier and micrometer instruments, gage blocks, indicators, electronic comparators, angular measurements, calibration procedures, coordinate measuring machines, theodolite and laser alignment equipment, and evaluate failure analysis procedures.	ARS 276	<b>INSTRUMENTATION AND ATTACHMENTS (2T,2E) 3 credits</b> <b>COREQUISITE: ARS 100</b> This course includes how thermocouples, temperature sensors, and strain gages are used in the aerospace industry and how they are installed on different types of airframes and structures. This course also includes the bonding materials, soldering techniques, and electrical testing of temperature sensors and strain gages.
ARS 251	<b>SPECIALIZED WELDING PROCESSES AND LAB (3T, 2E) 4 credits</b> <b>PREREQUISITE: ARS 151 AND ARS 153</b> <b>COREQUISITE: ARS 100</b> A study of the welding processes most commonly used in aerospace other than Arc such as Electron Beam, Ultrasonic, Pressure, Flash Butt, Inertia, Friction, Explosive, Stud, Resistance, Laser, and Diffusion Bonding will be examined.	ARS 278	<b>ADHESIVE BONDING (2T,2E) 3 credits</b> <b>COREQUISITE: ARS 100</b> This course includes mixing and applying adhesives for pressure, safety, corrosion, weather, and fuel tank sealing for various aerospace applications. This course also includes a study of why different adhesives are used and how exposure to different elements affect the adhesives.
ARS 252	<b>WELDING INSPECTION PROCEDURES (3T, 2E) 4 credits</b> <b>PREREQUISITE: ARS 151 AND ARS 153</b> <b>COREQUISITE: ARS 100</b> The reasons for and the objective of welding inspection will be examined. A beginning understanding of visual, penetrant, ultrasonic and radiographic inspection will be studied. Defect types and effects on the hardware functional life will be examined. The critical nature of repairs will also be examined.	ARS 280	<b>SURFACE PREPARATION AND PAINTING OPERATIONS (2T,2E) 3 credits</b> <b>COREQUISITE: ARS 100</b> This course is a study of preparation of component surfaces for various coating and painting applications. This course also includes measurement of paint and coating thickness both wet and dry, how colors are developed, and how to operate a paint booth electrical and air systems.
ARS 253	<b>HYDROSTATIC AND PNEUMATIC PROCESSES (3T) 3 credits</b> <b>COREQUISITE: ARS 100</b> The use of high-pressure fluids and gases to form, size, qualify and proof test small and large aerospace products will be studied. The benefits of forming into tools versus stamping or stretching will be examined. The security of final sizing and proof testing will be examined.	ARS 282	<b>INTEGRATED ASSEMBLY PROJECT (6E) 3 credits</b> <b>PREREQUISITE: ARS 152, ARS 176, ARS 178, ARS 276, ARS 278 ARS 280 AND ARS 284</b> This project course will offer the student the opportunity to complete a hands-on project including all training in aerospace structures and assembly. The student will follow a work order to assemble a project that includes installing rivets, building and installing a wire harness, welding and installing stainless steel tubes, painting and installing and testing various attachments, instruments and sensors.
ARS 254	<b>COATINGS PRINCIPLES, APPLICATION AND PROCESSES (3T) 3 credits</b> <b>PREREQUISITE: ARS 151 AND ARS 153</b> <b>COREQUISITE: ARS 100</b> A study of the processes, methods, equipment and	ARS 284	<b>SPECIAL COATING APPLICATIONS (4T,4E) 6 credits</b> <b>COREQUISITE: ARS 100</b> This course is a study in special coatings for composite materials such as marshall convergent coating. This will address mixing, spraying, and curing of coating materials. This course also includes a study of how composite materials are manufactured, how composite materials are used, and why composite materials are used rather than metals.

**ANTHROPOLOGY (ANT)**

- ANT 200 INTRODUCTION TO ANTHROPOLOGY (3T) 3 credits**  
This course is a survey of physical, social, and cultural development and behavior of human beings.
- ANT 210 PHYSICAL ANTHROPOLOGY (3T) 3 credits**  
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.
- ANT 220 CULTURAL ANTHROPOLOGY (3T) 3 credits**  
This course is the application of the concept of culture to the study of both primitive and modern society.
- ANT 226 CULTURE AND PERSONALITY (3T) 3 credits**  
**PREREQUISITE: ANT 200**  
This course explores the relationship between personality development and culture from a cross cultural perspective.
- ANT 230 INTRODUCTION TO ARCHAEOLOGY (3T) 3 credits**  
This course is an introduction to archaeological excavation techniques and post-excavation laboratory procedures.
- ANT 236 FIELD SURVEY IN ARCHAEOLOGY (6E) 3 credits**  
**PREREQUISITE: ANT 230**  
This course permits students to apply archaeological techniques to field research projects.
- ANT 237 ARCHAEOLOGICAL LAB PROCEDURES (6E) 3 credits**  
**PREREQUISITE: ANT 230**  
This course specializes in artifact conservation, cataloging, sorting, storage, and general post-excavation cultural material administration. Learning methodology and understanding the deterioration-susceptibility of objects.
- ANT 246 PRESERVATION LAB PROCEDURES (6E) 3 credits**  
**PREREQUISITE: ANT 230**  
This course is primarily intended for students interested in pursuing museum science and archaeological laboratory procedures. It reviews technical information on curation, preservation, and conservation of physical and cultural objects.
- ANT 260 INDIANS OF NORTH AMERICA (3T) 3 credits**  
This course surveys the history, development, and culture of North American Indian tribes.

**ART (ART)**

- ART 100 ART APPRECIATION (3T) 3 credits**  
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 artwork. Upon completion, students should understand the fundamentals of art, the materials used and have a basic overview of the history of art.
- ART 101 ART WORKSHOP I (6E) 3 credits**  
**PREREQUISITE: Permission of instructor**  
This course provides an art experience for both non-art and art majors who are interested in a variety of art projects concerned with community or college related activities. Emphasis is placed on the organization of ideas in advancing their creative process. Upon completion, students should be able to present visual evidence of the activities involved and explain how the experience advanced their artistic skills.
- ART 102 ART WORKSHOP II (6E) 3 credits**  
**PREREQUISITE: Art Workshop I, Permission of instructor**  
This course provides an art experience for both non-art and art majors who are interested in a variety of art projects concerned with community or college related activities. Emphasis is placed on the organization of ideas in advancing their creative process. Upon completion, students should be able to present visual evidence of the activities involved and explain how the experience advanced their artistic skills.
- ART 109 ART MUSEUM SURVEY (3T) 3 credits**  
This course covers the art experienced through supervised visits to museums and art galleries. Emphasis is placed on learning through critical study. Upon completion, students should be able to write a critical analysis of the artwork experienced that demonstrates an understanding of aesthetics.



**Course Descriptions**

**COURSE DESCRIPTIONS**

ART 113	<p><b>DRAWING I (6E)</b> <span style="float: right;"><b>3 credits</b></span>            This course provides the opportunity to develop perceptual 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.</p>	ART 133	<p><b>CERAMICS I (6E)</b> <span style="float: right;"><b>3 credits</b></span>            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 their methods, as well as an understanding of the craftsmanship and aesthetics involved in ceramics.</p>
ART 114	<p><b>DRAWING II (6E)</b> <span style="float: right;"><b>3 credits</b></span>  <b>PREREQUISITE: ART 113</b>            This course advances the student's 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.</p>	ART 134	<p><b>CERAMICS II (6E)</b> <span style="float: right;"><b>3 credits</b></span>  <b>PREREQUISITE: ART 133</b>            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.</p>
ART 121	<p><b>TWO-DIMENSIONAL COMPOSITION I (6E)</b> <span style="float: right;"><b>3 credits</b></span>            This course introduces the basic concepts of two-dimensional design. Topics include the elements and principles of design with emphasis on the arrangements and relationships among them. Upon completion, students should demonstrate an effective use of these elements and principles of design in creating two-dimensional compositions.</p>	ART 173	<p><b>PHOTOGRAPHY I (6E)</b> <span style="float: right;"><b>3 credits</b></span>            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.</p>
ART 122	<p><b>TWO-DIMENSIONAL COMPOSITION II (6E)</b> <span style="float: right;"><b>3 credits</b></span>  <b>PREREQUISITE: ART 121</b>            This course covers the theory and practice of composing two-dimensional images. Emphasis is placed on the relation between the basic elements and principles of design and their impact on the visual message. Upon completion, students should, through personal expression, demonstrate an effective use of these elements and principles of design in creating two-dimensional compositions.</p>	ART 174	<p><b>PHOTOGRAPHY II (2T, 2E)</b> <span style="float: right;"><b>3 credits</b></span>  <b>PREREQUISITE: Permission of instructor</b>            This is a sequence to Photography I and serves as an introductory photography course. Emphasis is placed on aesthetic as well as technical aspects of photography. Upon completion, the student will be able to produce well composed photographs.</p>
ART 126	<p><b>COLOR (6E)</b> <span style="float: right;"><b>3 credits</b></span>            This course introduces the student to fundamentals of color and color uses. Topics include various color theories, technical skills in mixing color, types of pigment and the expressive uses of color. Upon completion, students should be able to explain and demonstrate a fundamental understanding of color as it is used in the development of assigned color problems.</p>	ART 176	<p><b>FILMMAKING (6E)</b> <span style="float: right;"><b>3 credits</b></span>            This course provides a knowledge of the basics of filmmaking. Emphasis is placed on procedure, equipment, editing and sound. Upon completion, students should demonstrate a basic knowledge of filmmaking through critical analysis and film projects.</p>
ART 127	<p><b>THREE-DIMENSIONAL COMPOSITION (6E)</b> <span style="float: right;"><b>3 credits</b></span>  <b>PREREQUISITE: ART 113 or ART 121</b>            This course introduces art materials and principles of design that acquaint the beginner with the fundamentals of three-dimensional art. Emphasis is placed on the use of art fundamentals and the creative exploration of materials in constructing three-dimensional artworks. Upon completion, students should demonstrate basic technical skills and a personal awareness of the creative potential inherent in three-dimensional art forms.</p>	ART 177	<p><b>COLOR PHOTOGRAPHY (2T, 2E)</b> <span style="float: right;"><b>3 credits</b></span>  <b>PREREQUISITE: ART 173 or ART 176 or Permission of instructor</b>            This course covers the primary materials and processes of color photography. Emphasis is placed on the correct exposure, processing, creative color usage, and printing of both positive/negative color materials through exploration of films, filters, processes, and color temperature. Upon completion, students should be able to correctly execute the technical controls of color materials and explore the creative possibilities of color photography.</p>
		ART 178	<p><b>AUDIO-VISUAL TECHNIQUES (1T, 2E)</b> <span style="float: right;"><b>2 credits</b></span>            This course is an exploration of the area of linkage between the visual and auditory senses. Work with sound and recording equipment, projected images and multimedia hardware and software is included.</p>

	Students will produce finished multimedia pieces.		
<b>ART 187</b>	<b>PHOTOGRAPHY, FILM, AND MEDIA I (1T, 2E)</b> <b>2 credits</b> <b>PREREQUISITE: ART 173 or PFC 177 or Permission of instructor</b> This course is designed to help the student explore creative approaches to photography, film, and related media. Problems in darkroom techniques, laboratory techniques, and special effects are included. Upon completion, the student should be able to apply these techniques to professional quality finished pieces.	<b>ART 217</b>	<b>PRINTMAKING II (6E)</b> <b>3 credits</b> <b>PREREQUISITE: ART 216 or Permission of instructor</b> This course provides the opportunity for the student to study a printmaking process beyond the introductory level. Emphasis is placed on creativity, composition, and technique in the communication of ideas through printmaking. Upon completion, students should demonstrate an understanding of the printmaking process as a creative tool for the expression of ideas.
<b>ART 188</b>	<b>PHOTOGRAPHY, FILM, AND MEDIA II (1T, 2E)</b> <b>2 credits</b> <b>PREREQUISITE: PFC 187 or Permission of instructor</b> This course is designed to help the student explore creative approaches to photography, film, and related media in greater depth. Problems in darkroom techniques, laboratory techniques, and special effects are included. Upon completion, the student should be able to apply these techniques to professional quality finished pieces.	<b>ART 221</b>	<b>COMPUTER GRAPHICS I (6E)</b> <b>3 credits</b> This course is designed to enhance the student's ability to produce computer generated graphics. Emphasis is on the application of original design to practical problems using a variety of hardware and software. Upon completion, students should have an understanding of professional computer graphics.
<b>ART 190</b>	<b>ART: LEGAL AND FINANCIAL MANAGEMENT (3T)</b> <b>3 credits</b> This course is designed to acquaint the student with funding sources, business procedures, and project planning for the visual artist. Topics may include grants, budgeting, legal contracts, and self-promotion. Upon completion, students should demonstrate a knowledge of the basics of managing an art related business.	<b>ART 231</b>	<b>WATERCOLOR PAINTING I (6E)</b> <b>3 credits</b> 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.
<b>ART 203</b>	<b>ART HISTORY I (3T)</b> <b>3 credits</b> 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.	<b>ART 232</b>	<b>WATERCOLOR II (6E)</b> <b>3 credits</b> <b>PREREQUISITE: ART 231</b> 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 reflects a personal awareness of the media's potential.
<b>ART 204</b>	<b>ART HISTORY II (3T)</b> <b>3 credits</b> This course covers 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.	<b>ART 233</b>	<b>PAINTING I (6E)</b> <b>3 credits</b> 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.
<b>ART 216</b>	<b>PRINTMAKING I (6E)</b> <b>3 credits</b> This course introduces various printmaking processes. Topics include relief, intaglio, serigraphy, or lithography and the creative process. Upon completion, students should have a basic understanding of the creative and technical problems associated with printmaking.	<b>ART 234</b>	<b>PAINTING II (6E)</b> <b>3 credits</b> <b>PREREQUISITE: ART 233</b> 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.
		<b>ART 243</b>	<b>SCULPTURE I (6E)</b> <b>3 credits</b> This course provides a study of three-dimensional form by familiarizing students with sculpting media and techniques. Topics include the fundamentals of

**Course Descriptions**

**COURSE DESCRIPTIONS**

	art and sculpting media with emphasis on the creative process. Upon completion, students should understand the fundamentals of art and three-dimensional form, as well as the various media and processes associated with sculpture.		and be able to explain how the experience advanced their knowledge of communicating through art.
ART 244	<b>SCULPTURE II (6E)</b> <span style="float:right">3 credits</span> <b>PREREQUISITE: ART 243</b> This course is designed to sharpen skills in the media and processes of sculpture. Emphasis is placed on personal expression through three-dimensional form. Upon completion, students should be able to apply the fundamentals of art, their knowledge of form, and the sculptural processes to communicating ideas.	ART 273	<b>STUDIO PHOTOGRAPHY I (2T, 2E)</b> <span style="float:right">3 credits</span> This course stresses image-making problems requiring studio or other controlled environment solutions. Lights, props, and related equipment and techniques are utilized. The student will produce quality photographs using studio techniques.
ART 253	<b>GRAPHIC DESIGN I (6E)</b> <span style="float:right">3 credits</span> <b>PREREQUISITE: VCM 180 or Permission of instructor</b> This course is designed to introduce the study of visual communication through design. Emphasis is placed on the application of design principles to projects involving such skills as illustration, layout, typography, and production technology. Upon completion, students should demonstrate a knowledge of the fundamentals of art and understanding of the relationship between materials, tools and visual communication.	ART 274	<b>STUDIO PHOTOGRAPHY II (2T, 2E)</b> <span style="float:right">3 credits</span> <b>PREREQUISITE: PFC 273 or Permission of instructor</b> This course deals with advanced problems requiring studio or other controlled environment solutions. Lights, props, and related equipment and techniques are utilized. The student will produce quality photographs using studio techniques.
ART 254	<b>GRAPHIC DESIGN II (6E)</b> <span style="float:right">3 credits</span> <b>PREREQUISITE: VCM 180 or ART 253</b> This course further explores the art of visual communication through design. Emphasis is placed on the application of design principles to projects involving such skills as illustration, layout, typography, and production technology. Upon completion, students should be able to apply the knowledge of the fundamentals of art, material and tools to the communication of ideas.	ART 291	<b>SUPERVISED STUDY IN STUDIO ART I (2-8E)</b> <span style="float:right">1-4 credits</span> <b>PREREQUISITE: Permission of instructor</b> 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 instructor. Upon completion, the student should have a greater expertise in a particular area of art.
ART 258	<b>PHOTOGRAPHIC AND MEDIA PROBLEMS (1T, 2E)</b> <span style="float:right">2 credits</span> This course deals with special problems in the student's area of interest. Emphasis is placed on design, technique and results. Upon completion, the student will be able to produce professional quality photographs in one particular area of photography.	ART 292	<b>SUPERVISED STUDY IN STUDIO ART II (2-8E)</b> <span style="float:right">1-4 credits</span> <b>PREREQUISITE: ART 291, Permission of instructor</b> This course is designed to enable the student to continue studio experiences in greater depth. Topics are chosen by the student with the approval of the instructor. Upon completion, the student should have greater expertise in a particular area of art.
ART 263	<b>MUSEUM PRACTICE I (2-8E)</b> <span style="float:right">1-4 credits</span> <b>PREREQUISITE: Permission of instructor</b> This course provides an introduction to a variety of museum works, with practical training supervised by museum staff. Topics may include promotion, shipping, labeling and hanging of a museum exhibit as well as the study of the work itself. Upon completion, students should understand the activities surrounding a museum exhibit and be able to explain how the experience advanced their knowledge of communicating through art.	ART 293	<b>DIRECTED READINGS IN ART I (3T)</b> <span style="float:right">3 credits</span> This course offers supervised readings in the literature of visual art. Emphasis is placed on in-depth analysis of the chosen area of study. Upon completion, students should have an extensive knowledge of an advanced area in art and evidence of their work in the form of research.
ART 264	<b>MUSEUM PRACTICE II (2-8E)</b> <span style="float:right">1-4 credits</span> <b>PREREQUISITE: ART 263 or Permission of instructor</b> This course provides further study of museum artworks, with practical training supervised by museum staff. Topics may include promotion, shipping, labeling and hanging of a museum exhibit as well as the study of the work itself. Upon completion, students should understand the activities surrounding a museum exhibit	ART 294	<b>DIRECTED READINGS IN ART II (3T)</b> <span style="float:right">3 credits</span> <b>PREREQUISITE: ART 293</b> This course offers supervised readings in the literature of visual art. Emphasis is placed on an in-depth analysis of the chosen area of study. Upon completion, students should have an extensive knowledge of an advanced area in art and evidence of their work in the form of research.
		ART 299	<b>ART PORTFOLIO (2-8E)</b> <span style="float:right">1-4 credits</span> <b>PREREQUISITE: Permission of instructor</b> This course is designed to help the art major in the preparation and presentation of an art portfolio. Emphasis is placed on representing the student's potential as an artist in order to interest employers, clients or schools. Upon completion, students should be able to make a professional presentation of their design and communication skills.

**ASTRONOMY (AST)**

**AST 220 INTRODUCTION TO ASTRONOMY (3T, 2E) 4 credits**  
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 extragalactic objects, and cosmology. Laboratory is required.

**BARBERING (BAR)**

**BAR 110 ORIENTATION TO BARBERING (3T) 3 credits**  
**FORMERLY: BAR 101**  
This course provides an orientation to professional barber-styling. Topics include professional image, basic fundamentals, and the history of barber-styling. Upon completion, the student should be able to identify the core concepts of the profession.

**BAR 111 SCIENCE OF BARBERING (1T, 2E, 3M) 3 credits**  
**FORMERLY: BAR 110**  
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, and 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.

**BAR 112 BACTERIOLOGY AND SANITATION (3T) 3 credits**  
**FORMERLY: BAR 101**  
This course provides the theory of bacteriology and sanitation. Topics include the types of bacteria and sanitation procedures. Upon completion, the student should be able to identify types of bacteria and methods of sanitation.

**BAR 113 BARBER-STYLING LAB (9M) 3 credits**  
**FORMERLY: BAR 110**  
This course provides practical application of barber-styling fundamentals. Emphasis is placed on the care of implements, shampooing, and haircutting. Upon completion, the student should be able to care for his/her implements properly and demonstrate the basic techniques of shampooing and haircutting with only minimal supervision.

**BAR 114 ADVANCED BARBER-STYLING LAB (9M) 3 credits**  
**FORMERLY: BAR 120**  
This course provides the student with practical experience in haircutting and facial massage. Emphasis is placed on hands-on experience. Upon completion, the student should be able to demonstrate on a model the correct procedures for a facial massage and basic haircut.

**BAR 120 PROPERTIES OF CHEMISTRY (3T) 3 credits**  
**FORMERLY: BAR 102**  
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.

**BAR 121 CHEMICAL HAIR PROCESSING (9M) 3 credits**  
**FORMERLY: BAR 130**  
This course provides the student with knowledge and hands-on experience using chemicals to alter the appearance of hair. Emphasis is placed on the use of chemicals to relax, wave, and soft curl the hair. Upon completion, the student should be competent in the use of chemicals to produce desired structure changes to the hair.

**BAR 122 HAIR COLORING CHEMISTRY (3T) 3 credits**  
**FORMERLY: BAR 102**  
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.

**BAR 124 HAIR COLORING METHODOLOGY LAB (9M) 3 credits**  
**FORMERLY: BAR 131**  
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.

**BAR 130 MARKETING AND BUSINESS MANAGEMENT (3T) 3 credits**  
**FORMERLY: BAR 105**  
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 locations, and legal regulations. Upon completion, the student should be aware of marketing and business management requirements for a successful salon.

**BAR 131 STRUCTURE AND DISORDERS OF NAILS (1.5T, 4.5M) 3 credits**  
**FORMERLY: BAR 103**  
This course provides the student with the knowledge of nail structure and experience in identifying nail disorders. Emphasis is placed on identifying disorders and on using the correct implements and supplies for healthy nail care and manicures. Upon completion, the student should be capable of providing professional nail care.

**Course Descriptions**

**COURSE DESCRIPTIONS**

**BAR 132 HAIR STYLING AND DESIGN (3T) 3 credits**  
**FORMERLY: BAR 104**  
This course introduces the student to the art of hair style and design. Topics include the selection of styles to create a mood or complement facial features as well as hair replacement and hair pieces. Upon completion, the student should know the principles of style and design.

**BAR 133 HAIR STYLING AND MANAGEMENT LAB (9M) 3 credits**  
**FORMERLY: BAR 140**  
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 (10M) 2 credits**  
**FORMERLY: BAR 150**  
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 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 be able to function in a professional setting with very little assistance.

**BAR 141 PRACTICUM (10M) 2 credits**  
**FORMERLY: BAR 151**  
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.

**BIOLOGY (BIO)**

**BIO 101 INTRODUCTION TO BIOLOGY I (3T, 2E) 4 credits**  
Introduction to Biology I is the first of a two-course sequence designed for non-science majors. It covers historical studies illustrating the scientific method, cellular structure, bioenergetics, Mendelian and molecular genetics and a survey of human organ systems. Special attention is paid to biological information that will allow each student to live a healthier life and be better prepared to understand human activity. Laboratory is required.

**BIO 102 INTRODUCTION TO BIOLOGY II (3T, 2E) 4 credits**  
**PREREQUISITE: BIO 101**  
Introduction to Biology II is the second of a two-course sequence for non-science majors. It covers the theory of evolution, evolutionary principles and relationships, environmental and ecological topics, classi-

fication, and a survey of biodiversity. Each student will be prepared to make informed decisions on environmental and ecological issues. Laboratory is required.

**BIO 103 PRINCIPLES OF BIOLOGY I (3T, 2E) 4 credits**  
This is an introductory course for both 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. Laboratory is required.

**BIO 104 PRINCIPLES OF BIOLOGY II (3T, 2E) 4 credits**  
**FORMERLY: BIO 104 (Animal Biology) and BIO 105 (Plant Biology)**  
**PREREQUISITE: BIO 103**  
This course is an introduction to basic ecological and evolutionary relationships of plants and animals and a survey of plant and animal diversity including classification, morphology, physiology, and reproduction. Laboratory is required.

**BIO 201 HUMAN ANATOMY AND PHYSIOLOGY I (3T, 2E) 4 credits**  
**PREREQUISITE: BIO 103 or successful completion of BIO 103 challenge exam.**  
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. Laboratory is required.

**BIO 202 HUMAN ANATOMY AND PHYSIOLOGY II (3T, 2E) 4 credits**  
**PREREQUISITE: BIO 103 and BIO 201 or BIO 103 and permission of the instructor.**  
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; acid-base balance; and the endocrine, respiratory, digestive, excretory, cardiovascular, lymphatic and reproductive systems. Dissection, histological studies, and physiology are featured in the laboratory experience. Laboratory is required.

**BIO 211 Human Anatomy and Physiology for Health Occupations I (3T, 2E) 4 Credits**  
**PREREQUISITE: As required by the program**  
This course is the first in a two-course sequence which covers the basic structure and function of the human body. Tissues and the following organ systems are covered: integumentary, skeletal, muscular, nervous, sensory, endocrine, circulatory, digestive,

respiratory, excretory, and reproductive. Upon completion, students should be able to demonstrate a basic understanding of the fundamental principles of human anatomy and physiology and their interrelationships. Laboratory is required.

- BIO 220 GENERAL MICROBIOLOGY (2T, 4E) 4 credits**  
**PREREQUISITE: BIO 103**  
 This course includes historical perspectives, cell structure and function, microbial genetics, infectious diseases, immunology, distribution, physiology, culture, identification, classification, and control of microorganisms. The laboratory experience includes micro-techniques, distribution, culture, identification, and control. Laboratories are required.
- BIO 240 FIELD BIOLOGY (3T, 2E) 4 credits**  
**FORMERLY: BIO 280**  
**PREREQUISITE: BIO 103**  
 This course covers basic principles of taxonomy, classification, and selected ecological concepts. Animal and plant diversity is emphasized through collection, identification, and museum preparation of local flora and fauna. Laboratory is required.
- BIO 250 DIRECTED STUDIES IN BIOLOGY (2-8E) 1-4 credits**  
**FORMERLY: BIO 296**  
**PREREQUISITE: Permission of instructor**  
 This course is designed for independent study in specific areas of biology chosen by the student in consultation with a faculty member and carried out under faculty supervision.
- BIO 251 DIRECTED STUDIES IN BIOLOGY (2-8E) 1-4 credits**  
**PREREQUISITE: BIO 250 and Permission of instructor**  
 This course is designed for independent study in specific areas of biology chosen by the student in consultation with a faculty member and carried out under faculty supervision.
- BIO 286,287 FIELD STUDIES IN PLANT ECOLOGY I and II (1-2T, 2-4E) 2-4 credits each**  
**PREREQUISITE: Permission of instructor**  
 These courses introduce a strong field component into our Biology program and expose students to unique ecosystems like the Great Smoky Mountains National Park and the Chihuahuan Desert of Big Bend National Park in western Texas. These laboratory intensive courses introduce plants in selected communities and emphasize identification, sampling and collecting techniques in the field.
- BIO 288, 289 FIELD STUDIES IN MARINE BIOLOGY I and II (1-2T, 2-4E) 2-4 credits each**  
**PREREQUISITE: Permission of instructor**  
 These laboratory intensive courses introduce salt water and marsh environments with emphasis on vertebrates. Pertinent ecological concepts are introduced using sampling, collecting, preserving, and identifica-

tion techniques. These courses are offered for students to obtain first hand field experience in marine ecosystems especially on the Gulf Coast. In the past students have studied Marine Biology at the Dauphin Island Sea Lab, the Florida State University Marine Laboratory, Dog Island Sound/St. George Island, taken sampling excursions in the Gulf of Mexico aboard research vessels, and studied ornithology and salt water marshes on the Mississippi Sound coastline.

**BASIC SKILLS READING (RDG)**

- RDG 085 DEVELOPMENTAL READING (3T) 3 credits**  
 This course is designed to improve reading and critical thinking skills. Topics include vocabulary enhancement; extracting implied meaning; analyzing author's purpose, tone, and style; and drawing conclusions and responding to written material. Upon completion, students should be able to comprehend and analyze college-level material.

**BASIC STUDY SKILLS (BSS)**

- BSS 100 STUDY SKILLS (1T) 1 credit**  
 This course is intended for those who placed into credit-level course work but who are not maintaining satisfactory academic progress toward meeting program goals. Topics include study skills, note taking, learning styles and strategies, test taking, goal setting, and self-assessment skills. Upon completion, students should be able to manage their learning experiences to successfully meet educational goals.
- BSS 118 STUDY SKILLS (1T) 1 credit**  
 This course covers skills and strategies designed to improve study behaviors. Topics include time management, note taking, test taking, memory techniques, active reading strategies, critical thinking, communication skills, learning styles, and other strategies for effective learning. Upon completion, students should be able to apply appropriate study strategies and techniques to the development of an effective study plan.

**BUSINESS (BUS)**

- BUS 100 INTRODUCTION TO BUSINESS (3T) 3 credits**  
 This is a survey course designed to acquaint the student with American business as a dynamic process in a global setting. Topics include the private enterprise system, forms of business ownership, marketing, factors of production, personnel, labor, finance, and taxation.
- BUS 147 INTRODUCTION TO FINANCE (3T) 3 credits**  
 This course is a survey of monetary and credit systems. Topics include the role of the Federal Reserve System, sources of capital including forms of long-

**Course Descriptions**

term corporate financing, and consumer credit in the financial structure of our economy.

**BUS 150 BUSINESS MATH (3T) 3 credits**  
This course is a study of practical business mathematics. Topics include fundamental processes of arithmetic with emphasis on decimals and percentages, markup, discounts, bank reconciliation, simple and compound interest, discounting notes, depreciation methods, and present value.

**BUS 177 SALESMANSHIP (3T) 3 credits**  
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 190 MANAGEMENT WORKSHOP (1-3T) 1 - 3 credits**  
This course is a part of a series of workshops wherein current topics of interest are presented. They are offered upon demand and can be tailored to the needs of individuals, business and industry.

**BUS 190A PEACHTREE ACCOUNTING IN WINDOWS (1-2T) 1 -2 credits**  
**PREREQUISITE: Some Accounting Knowledge**  
Peachtree Accounting in Windows is a fully functional accounting software package that will meet the accounting needs of all types of businesses. Topics include setting up an accounting system, General Ledger, Invoicing, Purchasing, Accounts Receivables, Accounts Payable, Cash Receipts and Disbursements, Payroll, Job Costing, and Financial Reports.

**BUS 190B PROBLEM SOLVING (1T) 1 credit**  
The goal of this course is to help students improve problem-solving skills. Emphasis is placed on developing the five-step process for problem solving: Defining the Situation, Stating the Goal, Identifying a Solution, Preparing a Plan, and Taking Action.

**BUS 190C TEAMBUILDING (1T) 1 credit**  
The goal of this course is to help students identify factors and develop the skills necessary for becoming part of a successful team. Emphasis is placed on developing skills in communication, shared leadership, and conflict resolution.

**BUS 190D SELF-MANAGEMENT (1T) 1 credit**  
The goal of this course is to help students build skills necessary to take responsibility and adjust to the changing demands of the workplace. Emphasis is placed on developing abilities to adjust to new technologies or processes, upgrading skills, career planning, and personal transitions.

**BUS 190E EMPLOYABILITY SKILLS (1T) 1 credit**  
The goal of this course is to help students develop skills to make them more employable. Emphasis is placed on developing a professional resume and cover

letter, organizing a job search campaign, interviewing, resigning from a position, and accepting new positions.

**BUS 190F ORGANIZATIONAL COMMUNICATIONS (1T) 1 credit**  
The goal of this course is to help students build personal skills that allow them to communicate effectively in the workplace. Emphasis is placed on verbal, non-verbal, and written communications as they relate to professional work habits.

**BUS 190G INTERPERSONAL RELATIONS FOR MANAGEMENT (1T) 1 credit**  
The goal of this course is to help students achieve better interpersonal relationships on the job. Emphasis is placed on the concepts of professional treatment of customers, managing diversity, commitment to quality, managing office politics, developing positive attitudes, and self-discipline.

**BUS 190H TIME/PROJECT MANAGEMENT (1T) 1 credit**  
The goal of this course is to assist students in developing effective time management skills. Emphasis is placed on learning to set priorities, making decisions, delegating, concentrating on specific tasks, and increasing personal productivity.

**BUS 190I DIRECTED READINGS IN MANAGEMENT (1T) 1 credit**  
The goal of this course is to allow students to research a current topic of interest. Topics chosen should benefit the student's professional development or allow for gathering beneficial research for the student's place of work.

**BUS 190J ETHICS IN THE WORKPLACE (1T) 1 credit**  
The goal of this course is to allow students to explore the arena of ethics in the workplace. Emphasis is placed on ethics case studies.

**BUS 190K STRESS MANAGEMENT (1T) 1 credit**  
This course is designed to help students develop skills in managing stress associated with careers in business. Emphasis is placed on developing coping skills such as conflict resolution, delegation, and identifying problems early to avoid unnecessary stress.

**BUS 190L DEVELOPING A BUSINESS PLAN (1T) 1 credit**  
This course is designed to give students the opportunity to develop a personal business plan. The course focuses on the following areas: purpose of a business plan, mechanics of writing a business plan, components of a business plan, and research techniques.

**BUS 190M EVALUATING THE ENTREPRENEURIAL PERSONALITY (1T) 1 credit**  
This course is designed to allow students to identify in themselves and others characteristics that are favorable for the successful entrepreneur. Self-analysis and a study of entrepreneurial traits are included.

<p><b>BUS 190N FINANCING AN ENTREPRENEURIAL ENTERPRISE (1T) 1 credit</b> This course is designed to inform students about the options available for financing an entrepreneurial enterprise. The course allows students to investigate possible sources of financing and to study topics such as break-even analysis, fixed and variable costs, and financial statements.</p>	<p><b>BUS 190X WORKPLACE READINESS (1-3T) 1-3 credits</b> This course is designed to assess students' workplace skills and help them identify areas of weakness. Skills assessment tools such as WorkKeys will be utilized. Other components of workplace readiness will be included as needed.</p>
<p><b>BUS 190P PLANNING FOR SUPERVISING HUMAN RESOURCES (1T) 1 credit</b> This course is designed to offer insight into the employee relation side of conducting business. Emphasis is placed on identifying employment needs, training, supervising, and motivating employees.</p>	<p><b>BUS 190Y LEADERSHIP SKILLS (1T) 1 credit</b> This course is an overview of the characteristics of leadership. Emphasis is placed on what effective leaders do, leadership styles, and the differences between leadership and management.</p>
<p><b>BUS 190Q PLANNING MARKET STRATEGY (1T) 1 credit</b> This course is designed to allow owners of businesses to develop a market strategy. Included is a discussion of market analysis, competition, sales and distribution, and pricing strategies.</p>	<p><b>BUS 193 BUSINESS CO-OP I (1T) 1 credit</b> <b>PREREQUISITE: Successful completion of two (2) business courses</b> This course is part of a series wherein the student works in a degree/program related job. Emphasis is placed on student's work experience as it integrates academic knowledge with practical application through exposure to business and related practices in the working environment. The grade is based on the employer's evaluation of each student's productivity, content of a descriptive report submitted by the student, and student development and assessment of a learning contract.</p>
<p><b>BUS 190R PROMOTIONAL STRATEGIES (1T) 1 credit</b> This course allows students to look specifically at two kinds of promotional strategies: Advertising and Public Relations. Students explore how each of these strategies strongly affects the success of a business.</p>	<p><b>BUS 194 BUSINESS CO-OP II (1T) 1 credit</b> <b>PREREQUISITE: BUS 193</b> This course is a part of a series wherein the student works in a degree/program related job. Emphasis is placed on student's work experience as it integrates academic knowledge with practical application through exposure to business and related practices in the working environment. The grade is based on the employer's evaluation of each student's productivity, content of a descriptive report submitted by the student, and student development and assessment of a learning contract.</p>
<p><b>BUS 190S CHOOSING A LOCATION FOR A BUSINESS (1T) 1 credit</b> This course is designed to help students planning to start their own business to choose a suitable location and facility. Course content focuses on site location, purchasing or leasing an existing facility, and arranging layout.</p>	<p><b>BUS 195 BUSINESS CO-OP III (1T) 1 credit</b> <b>PREREQUISITE: BUS 194</b> This course is a part of a series wherein the student works in a degree/program related job. Emphasis is placed on student's work experience as it integrates academic knowledge with practical application through exposure to business and related practices in the working environment. The grade is based on the employer's evaluation of each student's productivity, content of a descriptive report submitted by the student, and student development and assessment of a learning contract.</p>
<p><b>BUS 190T STATISTICAL PROCESS CONTROL (SPC) - VARIABLE DATA (1T) 1 credit</b> This course covers descriptive statistics, types of data, and how to calculate, plot, and analyze various variable charts such as average and range, median and range, and standard deviations. Variable charts are used with measurable data.</p>	<p><b>BUS 196 BUSINESS CO-OP IV (1T) 1 credit</b> <b>PREREQUISITE: BUS 195</b> This course is a part of a series wherein the student works in a degree/program related job. Emphasis is placed on student's work experience as it integrates academic knowledge with practical application through exposure to business and related practices in the working environment. The grade is based on the</p>
<p><b>BUS 190U STATISTICAL PROCESS CONTROL (SPC) - ATTRIBUTE DATA (1T) 1 credit</b> This course addresses the development of non-measurable data into attribute charts for analysis of a process capability. Type of charts covered are P, NP, C and U with emphasis given to development of P-type charts.</p>	
<p><b>BUS 190V MANAGEMENT FOR ENTREPRENEURS (1T) 1 credit</b> This course is an overview of the principles of management as it relates to small and self-owned businesses. Emphasis is placed on planning, organizing, and controlling.</p>	
<p><b>BUS 190W CUSTOMER SERVICE STRATEGIES (1T) 1 credit</b> This course is an overview of the principles of customer service. Emphasis is placed on determining elements of customer satisfaction, creating a customer-focused culture, soliciting and using customer feed-</p>	

**Course Descriptions**

**COURSE DESCRIPTIONS**

	<p>employer's evaluation of each student's productivity, content of a descriptive report submitted by the student, and student development and assessment of a learning contract.</p>				<p>analysis, and cost accounting systems.</p>
BUS 197	<p><b>BUSINESS CO-OP V (1T)</b> <b>1 credit</b> <b>PREREQUISITE: BUS 196</b> This course is a part of a series wherein the student works in a degree/program related job. Emphasis is placed on student's work experience as it integrates academic knowledge with practical application through exposure to business and related practices in the working environment. The grade is based on the employer's evaluation of each student's productivity, content of a descriptive report submitted by the student, and student development and assessment of a learning contract.</p>		BUS 253	<p><b>INDIVIDUAL INCOME TAX (3T)</b> <b>3 credits</b> This course is intended to familiarize the student with the fundamentals of the federal income tax laws with primary emphasis on those affecting the individual. Emphasis is placed 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.</p>	
BUS 215	<p><b>BUSINESS COMMUNICATIONS (3T)</b> <b>3 credits</b> <b>PREREQUISITE: ENG 101</b> 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.</p>		BUS 261	<p><b>BUSINESS LAW I (3T)</b> <b>3 credits</b> This course provides an overview of legal principles affecting businesses. Topics include contracts, agency and employment, negotiable instruments, bailments and sale of goods.</p>	
BUS 241	<p><b>PRINCIPLES OF ACCOUNTING I (3T)</b> <b>3 credits</b> 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 and analysis.</p>		BUS 262	<p><b>BUSINESS LAW II (3T)</b> <b>3 credits</b> This course is a continuation of BUS 261. Topics include legal principles related to partnerships, corporations, real property and leases, insurance, security devices, bankruptcy, trust and estates; government regulations of business and labor; civil and criminal liability; and business security.</p>	
BUS 242	<p><b>PRINCIPLES OF ACCOUNTING II (3T)</b> <b>3 credits</b> <b>PREREQUISITE: BUS 241</b> 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.</p>		BUS 263	<p><b>THE LEGAL AND SOCIAL ENVIRONMENT OF BUSINESS (3T)</b> <b>3 credits</b> 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.</p>	
BUS 246	<p><b>ACCOUNTING ON THE MICROCOMPUTER (3T)</b> <b>3 credits</b> <b>PREREQUISITE: BUS 241</b> 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 principles. Upon completion of this course, the student will be able to use software programs for financial accounting applications.</p>		BUS 271	<p><b>BUSINESS STATISTICS I (3T)</b> <b>3 credits</b> <b>PREREQUISITE: Two years of high school algebra, intermediate college algebra, or appropriate score on math placement test</b> 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, estimating and introduction to hypothesis testing.</p>	
BUS 248	<p><b>MANAGERIAL ACCOUNTING (3T)</b> <b>3 credits</b> <b>PREREQUISITE: BUS 241</b> This course is designed to familiarize the student with management concepts and techniques of industrial accounting procedures. Emphasis is placed on cost behavior, contribution approach to decision-making, budgeting, overhead analysis, cost-volume-profit</p>		BUS 272	<p><b>BUSINESS STATISTICS II (3T)</b> <b>3 credits</b> <b>PREREQUISITE: BUS 271</b> This course is a continuation of BUS 271. Topics include sampling theory, statistical inference, regression and correlation, chi square, analysis of variance, time series index numbers, and decision theory.</p>	
			BUS 275	<p><b>PRINCIPLES OF MANAGEMENT (3T)</b> <b>3 credits</b> This course provides a basic study of the principles of management. Topics include planning, organizing, staffing, directing, and controlling with emphasis on</p>	

- practical business applications.
- BUS 276 HUMAN RESOURCE MANAGEMENT (3T) 3 credits**  
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 279 SMALL BUSINESS MANAGEMENT (3M) 3 credits**  
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 280 INDUSTRIAL MANAGEMENT (3T) 3 credits**  
This course provides an overview of management in an industrial setting. Topics include operations analysis, research and development, physical facilities, production planning, productivity improvement, product flow, quality control, jobs and wages, and employee motivation.
- BUS 285 PRINCIPLES OF MARKETING (3T) 3 credits**  
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 ALTERNATING BUSINESS CO-OP I (1-3T) 1-3 credits**  
**PREREQUISITE: Permission of instructor**  
This two-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 292 ALTERNATING BUSINESS CO-OP II (1-3T) 1-3 credits**  
**PREREQUISITE: Permission of instructor**  
This two-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 BUSINESS INTERNSHIP I (3T) 3 credits**  
**PREREQUISITE: Minimum 6 semester 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 or 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 297 BUSINESS INTERNSHIP II (3T) 3 credits**  
**PREREQUISITE: Minimum 6 semester 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 or 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.



## Course Descriptions

### CHEMISTRY (CHM)

CHM 099	<p><b>DEVELOPMENTAL CHEMISTRY (3T) 3 credits</b> This course is designed for students with little or no background in chemistry. This preparatory course offers a detailed review of the mathematical base for chemistry, including formulas and equations, and covers basic chemical calculations of stoichiometry, gas laws and solutions. Laboratory techniques and safety are also included.</p>	
CHM 104	<p><b>INTRODUCTION TO INORGANIC CHEMISTRY (3T, 2E) 4 credits</b> <b>FORMERLY: CHM 101 (Introduction to General Chemistry)</b> <b>PREREQUISITE: MTH 098 Elementary Algebra or equivalent math placement score.</b> 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.</p>	CHM 220
		<p><b>QUANTITATIVE ANALYSIS (3T, 2E) 4 credits</b> <b>PREREQUISITE: CHM 112 (Formerly CHM 114 and 115)</b> 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. NOTE: Taught only in spring semester of even numbered years, and only on the Decatur campus.</p>
CHM 105	<p><b>INTRODUCTION TO ORGANIC CHEMISTRY (3T, 2E) 4 credits</b> <b>FORMERLY: CHM 102</b> <b>PREREQUISITE: CHM 104 (Formerly CHM 101) or CHM 111 (Formerly CHM 113)</b> 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.</p>	CHM 221
		<p><b>ORGANIC CHEMISTRY I (3T, 2E) 4 credits</b> <b>FORMERLY: CHM 233 and CHM 234</b> <b>PREREQUISITE: CHM 112 (Formerly CHM 114 and CHM 115)</b> 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.</p>
CHM 111	<p><b>COLLEGE CHEMISTRY I (3T, 2E) 4 credits</b> <b>FORMERLY: CHM 113 and CHM 114</b> <b>PREREQUISITE: MTH 112, Precalculus Algebra or CHM 099</b> 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 measurements, 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.</p>	CHM 222
		<p><b>ORGANIC CHEMISTRY II (3T, 2E) 4 credits</b> <b>FORMERLY: CHM 234 and CHM 235</b> <b>PREREQUISITE: CHM 221 (Formerly CHM 233 and 234)</b> 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.</p>
CHM 112	<p><b>COLLEGE CHEMISTRY II (3T, 2E) 4 credits</b> <b>FORMERLY: CHM 114 and CHM 115</b> <b>PREREQUISITE: CHM 111 (Formerly CHM 113)</b> This is the second course in a two-semester sequence designed primarily for the science and engineering stu-</p>	CHM 250
		<p><b>DIRECTED STUDIES IN CHEMISTRY (1T) 1 credit</b> <b>PREREQUISITE: Permission of the instructor.</b> This course is designed for independent study in specific areas of chemistry chosen in consultation with a faculty member and carried out under faculty supervision. This course may be repeated three (3) times for credit.</p>

**CHILD DEVELOPMENT (CHD)**

- \*CHD 100 INTRODUCTION TO EARLY CARE AND EDUCATION OF CHILDREN (2T, 2E) 3 credits**  
 This course introduces the childcare 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. Upon completion students should be able to create and modify children's environments to meet individual needs, use positive guidance to develop positive relationships with children, and promote children's self-esteem, self-control and self-motivation.
- CHD 201 CHILD GROWTH AND DEVELOPMENT PRINCIPLES (3T) 3 credits**  
 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. Upon completion, students should be able to use knowledge of how young children differ in their development and approaches to learning to provide opportunities that support the physical, social, emotional, language, cognitive, and aesthetic development of children.
- \*CHD 202 CHILDREN'S CREATIVE EXPERIENCES (2T, 2E) 3 credits**  
 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. Upon completion, students should be able to select and implement creative and age-appropriate experiences for young children.
- CHD 203 CHILDREN'S LITERATURE AND LANGUAGE DEVELOPMENT (2T, 2E) 3 credits**  
 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. Upon completion, students should be able to create, evaluate and demonstrate activities which support a language-rich environment for young children.
- \*CHD 204 METHODS AND MATERIALS FOR TEACHING CHILDREN (1-3T, 2-6E) 1-3 credits**  
 This course introduces basic methods and materials used in teaching young children. Emphasis is placed on student's compiling a professional resource file of activities used for teaching math, language arts, and science and social studies concepts. Upon completion, students should be able to demonstrate basic methods of creating learning experiences using appropriate techniques, materials and realistic expectations.

- CHD 205 PROGRAM PLANNING FOR EDUCATING YOUNG CHILDREN (3T) 3 credits**  
 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 (3T) 3 credits**  
 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. Upon completion, students should be able to prepare a healthy, safe environment, plan nutritious meals and snacks, and recommend referrals, if necessary.
- CHD 207 ADMINISTRATION OF CHILD DEVELOPMENT PROGRAMS (3T) 3 credits**  
 This course includes appropriate administrative policies and procedures relevant to preschool programs. topics include local, state and federal regulations; budget planning; record keeping; personnel policies and parent involvement. Upon completion, students should be able to identify elements of a sound business plan, develop familiarity with basic record-keeping techniques, and identify elements of a developmentally appropriate program.
- CHD 209 INFANT AND TODDLER EDUCATION PROGRAMS (2-3T, 0-2E) 3 credits**  
 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. Upon completion, students should be able to plan an infant-toddler program and environment, that is appropriate and supportive of the families and the children.



**Course Descriptions**

**COURSE DESCRIPTIONS**

CHD 210	<b>EDUCATING EXCEPTIONAL YOUNG CHILDREN (2T, 2E)</b>	<b>3 credits</b>
	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. Upon completion, students should be able to identify appropriate strategies for working with young, exceptional children.	
CHD 214	<b>FAMILIES AND COMMUNITIES (3T)</b>	<b>3 credits</b>
	This course will provide students information about how to work with diverse families and communities. Students will be introduced to family and community settings, their important relationship to children, and the pressing needs of today's society. Students will study techniques for developing these important relationships and effective communication skills.	
CHD 215	<b>SUPERVISED PRACTICAL EXPERIENCES IN EARLY CHILDHOOD EDUCATION (6E)</b>	<b>3 credits</b>
	<b>PREREQUISITE: Permission of instructor</b> 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. Upon completion, students should be able to demonstrate competency in a child-care setting.	
CHD 220	<b>PARENTING SKILLS (1-3T)</b>	<b>1-3 credits</b>
	This course will focus on important issues in parenting education, beginning with prenatal concerns and continuing through childhood years. Particular emphasis will be placed on appropriate positive discipline methods.	
CHD 230	<b>INTRODUCTION TO SCHOOL-AGE PROGRAMS (2-3T, 0-2E)</b>	<b>1-3 credits</b>
	This course will introduce and discuss the unique aspects of quality school-age programs and the roles of the adult staff. Topics will include a brief view of child development, positive guidance techniques, administrative considerations, beginning program planning, and adaptations for a variety of program settings. Upon completion, students should be able to understand the staff's role, create and modify unique program settings, use positive guidance, and implement a quality program.	
CHD 231	<b>SCHOOL-AGE PROGRAMMING (2-3T, 0-2E)</b>	<b>1-3 credits</b>
	This course focuses on the specialized variety of needs for a quality school-age program. Topics will include program planning, and material considerations for a variety of quiet/active indoor/outdoor activities, health/safety/nutrition needs, parent and community information and involvement. Upon completion, the student should be able to select a variety of age-appropriate activities, implement a safe, healthy, quality program, and effectively communicate with parents and the community.	

\*Courses required in the Child Development Associate (CDA) Certification for employees currently employed within the industries.

**COMPUTER INFORMATION SYSTEMS (CIS)**

CIS 130	<b>INTRODUCTION TO INFORMATION SYSTEMS (3T)</b>	<b>3 credits</b>
	This course is an introduction to computers that reviews computer hardware and software concepts such as equipment, operations, communications, programming and societal issues. Topics include computer hardware, communication technologies and program development using computers to execute software packages and/or to write simple programs. Upon completion, students should be able to describe and use the major components of selected computer software and hardware.	
CIS 146	<b>MICROCOMPUTER APPLICATIONS (3T)</b>	<b>3 credits</b>
	This course is an introduction to the most common software applications of microcomputers and includes "hands-on" use of microcomputers and some of the major commercial software. These software packages should include typical features of office suites, such as word processing, spreadsheets, database systems, and other features found in current software packages. Upon completion, students will understand common applications and be able to utilize selected features of these packages.	
CIS 147	<b>ADVANCED MICRO APPLICATIONS (3T)</b>	<b>3 credits</b>
	<b>PREREQUISITE: CIS 146, Microcomputer Applications</b> This course is a continuation of CIS 146 in which students utilize the advanced features or topics of office suite software. Advanced features of spreadsheets and database packages 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.	
CIS 196	<b>COMMERCIAL SOFTWARE APPLICATIONS (1-3T)</b>	<b>1-3 credits</b>
	This is a "hands-on" introduction to software packages, languages, and utility programs currently in use, with the course being able to be repeated for credit for each different topic being covered. Emphasis is placed on the purpose, capabilities and utilization of each package, language or program. Upon completion, students will be able to use the features selected for the application covered.	
	<ul style="list-style-type: none"> <li>A. MS Windows Operating Systems</li> <li>B. MS Word for Windows</li> <li>C. MS Excel for Windows</li> <li>D. PowerPoint for Windows</li> <li>E. Access for Windows</li> <li>L. Introduction to the Internet</li> <li>U. Computer Literacy for Senior Adults</li> <li>V. Advanced Computer Literacy for Senior Adults</li> </ul>	
CIS 197T	<b>INTRODUCTION TO WEB PAGES</b>	<b>3 credits</b>
	This course introduces students to basics of navigating the World Wide Web and coding simple web pages using an authoring tool such as Front Page.	

CIS 197U	<b>WORD — MOUS PREP (CORE)</b>	<b>3 Credits</b>	This course is specifically designed to prepare students to take the Microsoft Office User Specialist (MOUS) certification exam in MS Word (core level). Topics emphasized are MOUS exam objectives and test-taking skills. The students will demonstrate mastery of core level word processing skills through hands-on, performance-based lab exercises. Practice test software will provide immediate feedback on areas where additional practice is needed. <u>Calhoun is an authorized Microsoft testing center.</u>	will demonstrate mastery of PowerPoint presentation skills through hands-on, performance-based lab exercises. Practice test software will provide immediate feedback on areas where additional practice is needed. <u>Calhoun is an authorized Microsoft testing center.</u>
CIS 197V	<b>WORD — MOUS PREP (EXPERT)</b>	<b>3 Credits</b>	This course is designed to prepare students to take the Microsoft Office User Specialist (MOUS) certification exam in MS Word (expert level). Topics emphasized are MOUS exam objectives and test-taking skills. The students will demonstrate mastery of expert level word processing skills through hands-on, performance-based lab exercises. Practice test software will provide immediate feedback on areas where additional practice is needed. <u>Calhoun is an authorized Microsoft testing center.</u>	CIS 197AA <b>OUTLOOK—MOUS PREP</b> <b>3 Credits</b> This course is designed to prepare students to take the Microsoft Office User Specialist (MOUS) certification exam in Outlook. Topics emphasized are MOUS exam objectives and test-taking skills. The students will demonstrate mastery of Outlook's integrated mail and scheduling skills through hands-on, performance-based lab exercises. Practice test software will provide immediate feedback on areas where additional practice is needed. <u>Calhoun is an authorized Microsoft testing center.</u>
CIS 197W	<b>ACCESS -MOUS PREP</b>	<b>3 Credits</b>	This course is designed to prepare students to take the Microsoft Office User Specialist (MOUS) certification exam in Access. Topics emphasized are MOUS exam objectives and test-taking skills. The students will demonstrate mastery of Access database skills through hands-on, performance-based lab exercises. Practice test software will provide immediate feedback on areas where additional practice is needed. <u>Calhoun is an authorized Microsoft testing center.</u>	CIS 198 <b>WEB PAGE DEVELOPMENT (3T)</b> <b>3 Credits</b> This course is an introduction to Web page development techniques. Topics in this course include HTML, scripting languages and commercial software packages used in the development of Web pages. Upon completion, the student will be able to demonstrate knowledge of the topics through the completion of Web page development projects and appropriate tests.
CIS 197X	<b>EXCEL — MOUS PREP (CORE)</b>	<b>3 Credits</b>	This course is designed to prepare students to take the Microsoft Office User Specialist (MOUS) certification exam in Excel (core level). Topics emphasized are MOUS exam objectives and test-taking skills. The students will demonstrate mastery of Excel spreadsheet core skills through hands-on, performance-based lab exercises. Practice test software will provide immediate feedback on areas where additional practice is needed. <u>Calhoun is an authorized Microsoft testing center.</u>	CIS 211 <b>BASIC PROGRAMMING (3T)</b> <b>3 credits</b> This course introduces fundamental concepts of the BASIC Programming language. This course includes file processing, internal sorts, and data structures. Upon completion, the student will be able to demonstrate knowledge of the topics through the completion of programming projects and appropriate tests.
CIS 197Y	<b>EXCEL — MOUS PREP (EXPERT)</b>	<b>3 Credits</b>	This course is designed to prepare students to take the Microsoft Office User Specialist (MOUS) certification exam in Excel (expert level). Topics emphasized are MOUS exam objectives and test-taking skills. The students will demonstrate mastery of advanced Excel spreadsheet skills through hands-on, performance-based lab exercises. Practice test software will provide immediate feedback on areas where additional practice is needed. <u>Calhoun is an authorized Microsoft testing center.</u>	CIS 212 <b>VISUAL BASIC (3T)</b> <b>3 credits</b> This course places emphasis on BASIC programming using a graphical user interface. The course will emphasize graphical user interfaces with additional topics in such areas as advanced file handling techniques, simulation, and other selected areas. Upon completion, the student will be able to demonstrate knowledge of the topics through the completion of programming projects and appropriate tests.
CIS 197Z	<b>POWERPOINT—MOUS PREP</b>	<b>3 Credits</b>	This course is designed to prepare students to take the Microsoft Office User Specialist (MOUS) certification exam in PowerPoint. Topics emphasized are MOUS exam objectives and test-taking skills. The students	CIS 213 <b>ADVANCED VISUAL BASIC (Formerly CIS 295) (3T)</b> <b>3 credits</b> <b>PREREQUISITE: CIS 212</b> This course is a continuation of CIS 212, Visual BASIC. It is designed to enhance student skills in Visual BASIC, with an emphasis on understanding techniques and procedures for developing projects using an object oriented language.
				CIS 222 <b>DATABASE MANAGEMENT SYSTEMS (3T)</b> <b>3 credits</b> This course will discuss database system architectures, concentrating on Structured Query Language (SQL). It will teach students how to design, normalize and use database using SQL, and to link these to the Web. Students will design and build a database-enabled Web site. Upon completion, the student will be able to demonstrate knowledge of the topics through the completion of projects and appropriate tests.



**COSMETOLOGY INSTRUCTOR TRAINING (CIT)**

- CIT 211**      **TEACHING & CURRICULUM DEVELOPMENT (3T)**      **3 credits**  
**PREREQUISITE:** Licensed managing cosmetologist; 1 year experience  
 This course focuses on the 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.
- CIT 212**      **TEACHER MENTORSHIP (9M)**      **3 credits**  
**FORMERLY:** COS 261  
**PREREQUISITE:** Licensed managing cosmetologist; 1 year experience  
 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.
- CIT 213**      **LESSON PLAN DEVELOPMENT (3T)**      **3 credits**  
**FORMERLY:** COS 231 and COS 241  
**COREQUISITE:** CIT 211, 212, or Permission of instructor  
**PREREQUISITE:** Licensed managing cosmetologist; 1 year experience  
 The 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.
- CIT 221**      **LESSON PLAN IMPLEMENTATION (9M)**      **3 credits**  
**PREREQUISITE:** Licensed managing cosmetologist; 1 year experience  
 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.
- CIT 222**      **INSTRUCTIONAL MATERIALS AND METHODS (3T)**      **3 credits**  
**COREQUISITE:** CIT 223 or Permission of instructor  
**PREREQUISITE:** Licensed managing cosmetologist; 1 year experience  
 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.

- CIT 223**      **INSTRUCTIONAL MATERIALS AND METHODS APPLICATIONS (9M)**      **3 credits**  
**FORMERLY:** COS 291  
**COREQUISITE:** CIT 222 or Permission of instructor  
**PREREQUISITE:** Licensed managing cosmetologist; 1 year experience  
 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.

**COMPUTER NUMERICAL CONTROL (CNC)**

- CNC 111**      **INTRODUCTION TO COMPUTER NUMERICAL CONTROL (1T, 2E)**      **2 credits**  
**PREREQUISITE:** MTT 101 and MTT 104  
 This course introduces the concepts and capabilities of computer numerical control machine tools. Topics include setup, operation, and basic applications. Upon completion, students should be able to explain operator safety, machine protection, data input, program preparation, and program storage.
- CNC 112**      **COMPUTER NUMERIC CONTROL TURNING (6E)**      **3 credits**  
**PREREQUISITE:** MTT 214  
 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 CNC turning centers.
- CNC 113**      **COMPUTER NUMERIC CONTROL MILLING (6E)**      **3 credits**  
**PREREQUISITE:** MTT 215  
 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 115**      **BASIC MATH FOR COMPUTERIZED NUMERICAL CONTROL (1T, 2E)**      **2 credits**  
**PREREQUISITE:** CNC 111  
 This course introduces the application of basic types and uses of compound angles. Emphasis is placed on problem solving by tilting and rotating adjacent angles to resolve an unknown compound angle. Upon completion, students should be able to set up and develop compound angles on parts using problem-solving techniques.

## Course Descriptions

CNC 181	<p><b>SPECIAL TOPICS IN COMPUTERIZED NUMERICAL CONTROL (6M)</b>      3 credits  <b>PREREQUISITE:</b> Permission of Instructor                  This course provides specialized instruction in various areas related to CNC. Emphasis is placed on meeting students' needs.</p>
CNC 211	<p><b>COMPUTER NUMERICAL CONTROL (2T)</b>      2 credits  <b>PREREQUISITE:</b> CNC 111 and CNC 112 and CNC 113                  This course provides concentrated study in advanced programming techniques for working with modern CNC machine tools. Topics include custom macros and subroutines, canned cycles, and automatic machining cycles currently employed by the machine tool industry. Upon completion, students should be able to program advanced CNC functions while conserving machine memory.</p>
CNC 212	<p><b>ADVANCED COMPUTER NUMERICAL CONTROL TURNING (1T, 3M)</b>      2 credits  <b>PREREQUISITE:</b> MTT 214                  This course covers advanced methods in setup and operation of CNC turning centers. Emphasis is placed on programming and production of complex parts. Upon completion, students should be able to demonstrate skills in programming, operations, and setup of CNC turning centers.</p>
CNC 213	<p><b>ADVANCED COMPUTER NUMERICAL CONTROL MILLING (1T, 3M)</b>      2 credits  <b>PREREQUISITE:</b> MTT 215                  This course covers advanced methods in setup and operation of CNC machining centers. Emphasis is placed on programming and production of complex parts. Upon completion, students should be able to demonstrate skills in programming, operations, and setup of CNC machining centers.</p>
CNC 222	<p><b>COMPUTER NUMERICAL CONTROL GRAPHICS: TURNING (1T, 4E)</b>      3 credits  <b>PREREQUISITE:</b> MTT 215                  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.</p>
CNC 223	<p><b>COMPUTER NUMERICAL CONTROL GRAPHICS PROGRAMMING: MILLING (1T, 4E)</b>      3 credits  <b>PREREQUISITE:</b> MTT 215                  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 CAM software to create a multi-axis CNC program.</p>

CNC 230	<p><b>COMPUTER NUMERICAL CONTROL SPECIAL PROJECTS (3M)</b>      3 credits  <b>PREREQUISITE:</b> Permission of Instructor                  This course is designed to allow students to work in the lab with limited supervision. The student is to enhance his/her proficiency levels on various CNC machine tools. Upon completion, students are expected to plan, execute, and present results of advanced CNC products.</p>
---------	--

## COSMETOLOGY (COS)

COS 111	<p><b>COSMETOLOGY SCIENCE AND ART (3T)</b>      3 credits  <b>FORMERLY:</b> COS 101  <b>COREQUISITE:</b> COS 112 or Permission of instructor                  In this course, students are provided a study of personal and professional image, ethical conduct, sanitation, hairstyling, and nail care. Topics include personal and professional development, bacteriology, decontamination, infection control, draping, shampooing, conditioning, hair shaping, and hair styling. Upon completion, students should be able to apply safety rules and regulations and write procedures for skills identified in this course.</p>
COS 112	<p><b>COSMETOLOGY SCIENCE AND ART LAB (9M)</b>      3 credits  <b>FORMERLY:</b> COS 110  <b>COREQUISITE:</b> COS 111 or Permission of instructor                  In this course, students are provided the practical experience for sanitation, shampooing, hair shaping, hairstyling, and nail care. Emphasis is placed on sterilization, shampooing, hair shaping, hairstyling, manicuring, and pedicuring. Upon completion, the student should be able to perform safety and sanitary precautions, shampooing, hair shaping, hairstyling, and nail care procedures.</p>
COS 113	<p><b>CHEMICAL METHODOLOGY (1T, 2E, 3M)</b>      3 credits  <b>FORMERLY:</b> COS 102  <b>COREQUISITE:</b> COS 114 or COS 115, or Permission of instructor                  This course focuses on the theory of hair and scalp disorders, permanent waving, chemical relaxers, and the composition of the hair. Topics include disorders and analysis of the scalp and hair, permanent waving, chemical hair relaxing, and soft curling. Upon completion, the student should be able to write procedures for permanent waving and chemical relaxing, identify the composition of the hair, safety and sanitary precautions and steps for scalp and hair analysis as well as the disorders.</p>
COS 114	<p><b>CHEMICAL METHODOLOGY LAB (9M)</b>      3 credits  <b>FORMERLY:</b> COS 120  <b>COREQUISITE:</b> COS 113 or Permission of instructor                  In this course, students are provided the practical experience of permanent waving, chemical relaxing, and hair analysis. Topics include permanent waving, chemical relaxing, soft curl, and scalp and hair analysis. Upon completion, the students should be able to analyze the scalp and hair and perform these chemical services using safety and sanitary precautions.</p>

<p><b>COS 121</b>      <b>COLORIMETRY (3T)</b>      <b>3 credits</b>  <b>FORMERLY: COS 102</b>  <b>COREQUISITE: COS 122 or Permission of instructor</b>                      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 should be able to identify all phases of hair coloring and the effects of the hair.</p>	<p><b>COS 143</b>      <b>HAIR DESIGNS (1T, 2E, 3M)</b>      <b>3 credits</b>  <b>FORMERLY: COS 105</b>                      This course focuses on the theory and practice of hair design. Topics include creating styles using basic and advanced techniques of back combing, up sweeps, and braiding. Upon completion, the student should be able to demonstrate the techniques and procedures for hair designing.</p>	<p>hair removal. 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.</p>
<p><b>COS 122</b>      <b>COLORIMETRY APPLICATIONS (9M)</b>      <b>3 credits</b>  <b>FORMERLY: COS 120</b>  <b>COREQUISITE: COS 121 or Permission of instructor</b>                      In this course, students apply hair coloring and hair lightening techniques. Topics include consultation, hair analysis, skin test and procedures and applications of all phases of hair coloring and lightening. Upon completion, the student should be able to perform procedures for hair coloring and hair lightening.</p>	<p><b>COS 146</b>      <b>HAIR ADDITIONS (2T, 2E, 3M)</b>      <b>4 credits</b>  <b>FORMERLY: COS 104</b>                      This course focuses on the practice of adding artificial hair. Topics include hair extensions, weaving, and braiding. Upon completion, the student should be able to demonstrate the techniques and procedures for attaching human hair and synthetic hair.</p>	
<p><b>COS 123</b>      <b>COSMETOLOGY SALON PRACTICES (9M)</b>      <b>3 credits</b>  <b>FORMERLY: COS 140</b>                      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.</p>	<p><b>COS 151</b>      <b>NAIL CARE (3T)</b>      <b>3 credits</b>  <b>FORMERLY: COS 105 and COS 106</b>  <b>COREQUISITE: COS 152 or Permission of instructor</b>                      This course focuses on all aspects of nail care. Topics include salon conduct, professional ethics, sanitation, nail structure, manicuring, pedicuring, nail disorders, and anatomy and physiology of the arm and hand. Upon completion, the student should be able to demonstrate professional conduct, recognize nail disorders and diseases, and identify the procedures for sanitation and nail care services.</p>	
<p><b>COS 124</b>      <b>INTRODUCTION TO SALON MANAGEMENT (3T)</b>      <b>3 credits</b>  <b>FORMERLY: COS 104</b>                      In this course, students will develop 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.</p>	<p><b>COS 152</b>      <b>NAIL CARE APPLICATIONS (9M)</b>      <b>3 credits</b>  <b>FORMERLY: COS 150 and COS 160</b>  <b>COREQUISITE: COS 151 or Permission of instructor</b>                      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.</p>	
<p><b>COS 131</b>      <b>ESTHETICS (3T)</b>      <b>3 credits</b>  <b>FORMERLY: COS 103</b>  <b>COREQUISITE: COS 132 or Permission of instructor</b>                      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, and hair removal. Upon completion, the student should be able to state procedures for analysis, light therapy, facials, hair removal, and identify the structures, functions and disorders of the skin.</p>	<p><b>COS 153</b>      <b>NAIL ART (3T)</b>      <b>3 credits</b>  <b>FORMERLY: COS 107</b>  <b>COREQUISITE: COS 154 or Permission of instructor</b>                      This course focuses on advanced nail techniques. Topics include acrylic, gel, fiberglass nails, and nail art. Upon completion, the student should be able to identify the different types of sculptured nails and recognize the different techniques of nail art.</p>	
<p><b>COS 132</b>      <b>ESTHETICS APPLICATIONS (9M)</b>      <b>3 credits</b>  <b>FORMERLY: COS 130</b>  <b>COREQUISITE: COS 131 or Permission of instructor</b>                      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, and</p>	<p><b>COS 154</b>      <b>NAIL ART APPLICATIONS (9M)</b>      <b>3 credits</b>  <b>FORMERLY: COS 170</b>  <b>COREQUISITE: COS 153 or Permission of instructor</b>                      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.</p>	

**Course Descriptions**

*The following labs are designed for students in need of additional lab hours or services in preparation for licensure exams. The labs will be directed by instructors according to the student's area of specialty and may be taken during the course of the program as needed.*

**COS 160 IMAGE PROJECTION (9M) 3 credits**  
**FORMERLY: COS 180**

This course includes the study of professionalism, personal development, and ethics related to skin care. Topics include practical applications for hygiene, care of the feet and nails, and human relations. Upon completion, the student will be able to project visual poise and demonstrate professionalism needed in customer service.

**COS 161 SPECIAL TOPICS IN COSMETOLOGY (1T) 1 credit**  
**FORMERLY: COS 297 OL**

**PREREQUISITE: Permission of instructor**  
This course is designed to survey current trends and developing technology for the cosmetology profession. Emphasis is placed on, but is not limited to, dependability, attitude, professional judgment, emerging trends, new styling techniques, and practical cosmetology skills. Upon completion, students should have developed new skills in areas of specialization for the cosmetology profession.

**COS 162 SPECIAL TOPICS IN COSMETOLOGY (2T) 2 credits**

**FORMERLY: COS 296OL**  
**PREREQUISITE: Permission of instructor**  
This course is designed to survey current trends and developing technology for the cosmetology profession. Emphasis is placed on, but is not limited to, dependability, attitude, professional judgment, emerging trends, new styling techniques, and practical cosmetology skills. Upon completion, students should have developed new skills in areas of specialization for the cosmetology profession.

**COS 163 FACIAL TREATMENTS (3T) 3 credits**  
**FORMERLY: COS 191**

This course includes all phases of facial treatments in the study of skin care. Topics include treatments for oily, dry, and special skin applications. Upon completion, students will be able to apply facial treatments according to skin type.

**COS 164 FACIAL MACHINE (9M) 3 credits**  
**FORMERLY: COS 202**

This is a course designed to provide practical experience using the vapor and facial machine with hydraulic chair. Topics include the uses of electricity and safety practices, machines and apparatus, use of the magnifying lamp, and light therapy. Upon completion, the student will be able to demonstrate an understanding of electrical safety and skills in the use of facial machines.

**COS 165 RELATED SUBJECTS-ESTHETICIANS (9M) 3 credits**  
**FORMERLY: COS 203**

This course includes subjects related to the methods for removing unwanted hair. This course includes such topics as electrolysis information and definitions, safety methods of permanent hair removal, the practice of removal of superfluous hair, and the use of depilatories. Upon completion of this course, students will be able to apply depilatories and practice all safety precautions.

**COS 166 COLOR PSYCHOLOGY – COORDINATION (9M) 3 credits**  
**FORMERLY: COS 204**

This skin care course is designed for the make-up artistry requirements to be a professional make-up artist. Topics in this course include art make-up techniques for all skin types, sanitation of application tools and color tonality as it relates to make-up. Upon completion of this course, students will be able to apply make-up after determining correct skin tones, skin types and facial shapes, and design personalized make-up techniques for clients.

**COS 168 BACTERIOLOGY AND SANITATION (3T) 3 credits**  
**FORMERLY: COS 181**

In this skin care course, emphasis is placed on the decontamination, infection control and safety practiced in the esthetics facility. Topics covered include demonstration of sanitation, sterilization methods and bacterial prevention. Upon completion, the student will be able to properly sanitize facial implements and identify non-reusable items.

**COS 169 SKIN FUNCTIONS (9M) 3 credits**  
**FORMERLY: COS 190**

This course introduces skin functions and disorders. Topics include practical application for skin disorder treatments, dermabrasion, and skin refining. Upon completion of this course, students will be able to demonstrate procedures for acne, facials, and masks for deeper layers and wrinkles.

**COS 190 INTERNSHIP IN COSMETOLOGY (5-15M) 1-3 credits**  
**FORMERLY: COS 141 AND COS 161**  
**PREREQUISITE: Permission of instructor**

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 191 CO-OP (5-15M) 1-3 credits**  
**FORMERLY: COS 151 and COS 171**  
**PREREQUISITE: Permission of instructor**

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.

**CRIMINAL JUSTICE (CRJ)**

**CRJ 100 INTRODUCTION TO CRIMINAL JUSTICE (3T) 3 credits**  
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 (3T) 3 credits**  
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 130 INTRODUCTION TO LAW AND JUDICIAL PROCESS (3T) 3 credits**  
This course provides an introduction to the basic elements of substantive and procedural law and the stages in the judicial process. It includes an overview of state and federal court structure.

**CRJ 140 CRIMINAL LAW AND PROCEDURE (3T) 3 credits**  
This course examines both substantive and procedural law. The legal elements of various crimes are discussed, with attention to the Alabama Code. Areas of criminal procedure essential to the criminal justice professional are covered.

**CRJ 146 CRIMINAL EVIDENCE (3T) 3 credits**  
This course considers the origins of the law of evidence and current rules of evidence. Types of evidence, their definitions and uses are covered, as well as the functions of the court regarding evidence.

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

**CRJ 157 COMMUNITY BASED CORRECTIONS (3T) 3 credits**  
This course examines various forms of community corrections and alternative sentences. Probation, parole, halfway houses, work release, community service, electronic monitoring and camps are among the programs considered.

**CRJ 160 INTRODUCTION TO SECURITY (3T) 3 credits**  
This course looks at the operation, organization and problems in providing safety and security to business enterprises. Private, retail and industrial security are covered.

**CRJ 161 INTRODUCTION TO PHYSICAL SECURITY (3T) 3 credits**  
This course provides an overview of the protection of people, property, and facilities through the use of

security forces, systems, and procedures.

**CRJ 162 SECURITY RISK MANAGEMENT (3T) 3 credits**  
This course deals with the identification of assets, threats, and vulnerabilities, and the development of countermeasures.

**CRJ 163 SECURITY MANAGEMENT (3T) 3 credits**  
This course introduces the student to sound security management theories, principles, budgeting, communications, and education.

**CRJ 164 INTERNATIONAL SECURITY (3T) 3 credits**  
This course provides an understanding of the security implications of international programs, commercial sales, the interrelationship of the information disclosure and technology transfer, the International Traffic in Arms Regulations, and the Export Administration Regulations.

**CRJ 166 PRIVATE AND RETAIL SECURITY (3T) 3 credits**  
This course surveys the legal foundations, regulations, training, and other issues in private security. Typical offenses, laws, and law enforcement strategies common in the field are covered. Methods of loss prevention are examined.

**CRJ 208 INTRODUCTION TO CRIMINOLOGY (3T) 3 credits**  
This course delves into the nature and extent of crime in the United States as well as criminal delinquent behavior and theories of causation. The study includes criminal personalities, principles of prevention, control and treatment.

**CRJ 209 JUVENILE DELINQUENCY (3T) 3 credits**  
This course examines the causes of delinquency. It also reviews programs of prevention and control of juvenile delinquency as well as the role of the courts.

**CRJ 216 POLICE ORGANIZATION AND ADMINISTRATION (3T) 3 credits**  
This course examines the principles of organization and administration of law enforcement agencies. Theories of management, budgeting, and various personnel issues are covered.

**CRJ 220 CRIMINAL INVESTIGATION (3T) 3 credits**  
This course explores the theory and scope of criminal investigation. The duties and responsibilities of the investigator are included. The techniques and strategies used in investigation are emphasized.

**CRJ 230 CRIMINALISTICS (3T) 3 credits**  
This course surveys the different techniques of scientific investigation. Emphasis is given to ballistics, photography, fingerprints, DNA, trace evidence, body flu-

**Course Descriptions**

**COURSE DESCRIPTIONS**

- ids, casts and the like.
- CRJ 256 CORRECTIONAL REHABILITATION (3T) 3 credits**  
This course surveys the different methods used in the rehabilitation of public offenders. Topics include individual and group counseling, education, recreation, religion, drug treatment, and vocational programs.
- CRJ 280 INTERNSHIP IN CRIMINAL JUSTICE (1-3T) 1-3 credits**  
**PREREQUISITE: Permission of instructor**  
This course involves practical experience with a criminal justice agency under faculty supervision. Permission of the instructor is required. This course may be repeated with the approval of the department head.
- CRJ 290 SELECTED TOPICS - SEMINAR IN CRIMINAL JUSTICE (1-3T) 1-3 credits**  
This course involves reading, research, writing, and discussion of selected subjects relating to criminal justice. Various contemporary problems in criminal justice are analyzed. This course may be repeated with approval of the department head.

**DENTAL ASSISTING (DNT)**

- DNT 100 INTRODUCTION TO DENTAL ASSISTING (2T) 2 credits**  
**PREREQUISITE: Admission to the Dental Assisting Program and Permission of instructor**  
**COREQUISITE: DNT 101, DNT 102, DNT 103, DNT 104, PSY 200**  
This course is designed to provide an introduction to dentistry and the history of dentistry, dental equipment, dental auxiliaries, psychology application to dentistry, personal and certification requirements, legal and ethical considerations, and work ethics and communication skills. Emphasis is placed on the Alabama Dental Practice Act and OSHA Standards. Upon completion, students should be able to discuss basic aspects of dentistry.
- DNT 101 PRE-CLINICAL PROCEDURES I (2T, 3S) 3 credits**  
**FORMERLY: DNT 101 and 102**  
**PREREQUISITE: Admission to the Dental Assisting Program and Permission of instructor**  
**COREQUISITES: DNT 100, DNT 102, DNT 103, DNT 104, PSY 200**  
This course is designed to introduce chairside assisting including concepts of four-handed dentistry, sterilization techniques, dental instruments, anesthesia, and operative dentistry. Emphasis will be placed on preparation of the student for clinical dental assisting. Upon completion, the student should be able to perform dental assisting skills in a clinical setting.

- DNT 102 DENTAL MATERIALS (2T, 3S) 3 credits**  
**FORMERLY: DNT 116**  
**PREREQUISITE: Admission to the Dental Assisting Program and Permission of instructor**  
**COREQUISITES: DNT 100, DNT 101, DNT 103, DNT 104, PSY 200**  
This course is designed to study the characteristics, manipulation, and application of dental materials ordinarily used in the dental office. Students will be given intra and extra-oral technical tasks to perform. Upon completion, students should be able to take and pour alginate impressions, trim study models, construct custom trays and temporary crowns, prepare and place restorative material, and manipulate cements and impression materials.
- DNT 103 ANATOMY AND PHYSIOLOGY FOR DENTAL ASSISTING (3T) 3 credits**  
**FORMERLY: DNT 186 and BIO 141**  
**PREREQUISITE: Admission to Dental Assisting Program and Permission of instructor**  
**COREQUISITE: DNT 100, DNT 101, DNT 102, DNT 104, PSY 200**  
This course is designed to study dental anatomy and the structure of the head and neck with a basic understanding of body structure and function. Emphasis will be placed on tooth and root morphology, and embryological and histological correlations will provide a foundation essential to an understanding of dental health. Upon completion, students should be able to discuss and identify the basic structure and function of the human body specifically the head, neck, and dentition.
- DNT 104 BASIC SCIENCES FOR DENTAL ASSISTING (2T) 2 credits**  
**FORMERLY: DNT 187 and BIO 142**  
**PREREQUISITE: Admission to Dental Assisting Program and Permission of instructor**  
**COREQUISITE: DNT 100, DNT 101, DNT 102, DNT 103, PSY 200**  
This course is designed to study basic microbiology, pathology, pharmacology, and medical emergencies. Emphasis is placed on the correlation of these sciences to the practice of dentistry. Upon completion, students should be able to apply basic science to the dental field.
- DNT 111 CLINICAL PRACTICE I (1T, 12C) 5 credits**  
**FORMERLY: DNT 173**  
**PREREQUISITE: Admission to Dental Assisting Program or Permission of instructor**  
**COREQUISITE: DNT 112, DNT 113, DNT 116, DNT 124, MTH 100 or 112 or 116, SPH 107**  
This course is designed to allow the student the opportunity for clinical observation and practical work experience in clinical settings under the supervision of a licensed dentist. Emphasis will be placed on the basic skills of chairside assisting. Upon completion, students should be able to demonstrate basic skills in the area of chairside assisting.