

## General Usage Courses

These courses are used in all disciplines by using the appropriate course prefix with a specific discipline or course content title.

### 90-190-290

**Coordinated Internship In \_\_\_\_\_**  
1-5 credits

Includes supervised practice in selected business, industrial, and service firms coordinated by the college. Credit/practice ratio maximum 1:5 hours. Variable hours per week.

### 93-193-293

**Studies In \_\_\_\_\_**  
1-5 credits

Covers new content not covered in existing courses in the discipline. Allows instructor to explore content and instructional methods to assess the course's viability as a permanent offering. Variable hours per week.

### 95-195-295

**Topics In \_\_\_\_\_**  
1-5 credits

Provides an opportunity to explore topic areas of an evolving nature or of short-term importance in the discipline. Variable hours per week.

### 96-196-296

**On-Site Training In \_\_\_\_\_**  
1-5 credits

Offers opportunities for career orientation and training without pay in selected businesses and industry. Supervised and coordinated by the college. Credit/work ratio not to exceed 1:5 hours. Variable hours per week.

### 97-197-297

**Cooperative Education In \_\_\_\_\_**  
1-5 credits

Provides on-the-job training for pay in approved business, industrial, and service firms. Applies to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. Variable hours per week.

### 98-198-298

**Seminar and Project In \_\_\_\_\_**  
1-5 credits

Requires completion of a project or research report related to the student's occupational objective and a study of approaches to the selection and pursuit of career opportunities in the field. Variable hours per week.

### 99-199-299

**Supervised Study In \_\_\_\_\_**  
1-5 credits

Assigns problems for independent study outside the normal classroom setting under the guidance and direction of an instructor. Incorporates prior experience and instruction in the discipline. Variable hours per week.

## Accounting

### ACC 100

**Introduction to Bookkeeping**  
5 credits

Presents the accounting cycle, focusing on the routine recording of data in journals and ledgers. Includes payroll preparation and practical procedures. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

### ACC 124

**Payroll Accounting**  
3 credits

Presents accounting systems and methods used in computing and recording payroll to include payroll taxes and compliance with federal and state legislation. Lecture 3 hours per week.

### ACC 211

**Principles of Accounting I**  
3 credits

Presents accounting principles/application to various businesses. Covers the accounting cycle, income determination, and financial reporting. Lecture 3 hours per week.

### ACC 212

**Principles of Accounting II**  
3 credits

Emphasizes partnerships, corporations and the study of financial analysis. Includes and introduces cost/managerial accounting concepts. Prerequisite: ACC 211. Lecture 3 hours per week.

### ACC 215

**Computerized Accounting**  
3 credits

Introduces the computer in solving accounting problems. Focuses on operation of computers. Presents the accounting cycle and financial statement preparation in a computerized system and other applications for financial and managerial accounting. Prerequisite or co-requisite: ACC 211 or equivalent. Lecture 3 hours per week.

### ACC 217

**Analyzing Financial Statements**  
3 credits

Explains the generation and limitations of data, techniques for analyzing the flow of a business's funds, and the methods of selecting and interpreting financial ratios. Offers analytical techniques through the use of comprehensive case studies. Prerequisite: ACC 211. Lecture 3 hours per week.

### ACC 219

**Government and Non-Profit Accounting**  
3 credits

Introduces fund accounting as used by governmental and nonprofit entities. Stresses differences between accounting principles of for-profit and not-for-profit organizations. Prerequisite: ACC 212 or equivalent. Lecture 3 hours per week.

**ACC 220****Accounting for Small Business**

3 credits

Presents practical accounting procedures for small business operations including service occupations, retail stores, and manufacturing operations. Covers the accounting cycle, journals, ledgers, preparation of financial statements and payroll, and checking account management. Includes regulations applicable to payroll, self-employment, social security and other taxes. Lecture 3 hours per week.

**ACC 221****Intermediate Accounting I**

4 credits

Covers accounting principles and theory, including a review of the accounting cycle and accounting for current assets, current liabilities and investments. Introduces various accounting approaches and demonstrates the effect of these approaches on the financial statement users. Prerequisite: ACC 212 or equivalent. Lecture 4 hours per week.

**ACC 222****Intermediate Accounting II**

4 credits

Continues accounting principles and theory with emphasis on accounting for fixed assets, intangibles, corporate capital structure, long-term liabilities, and investments. Prerequisite: ACC 212 or equivalent. Lecture 4 hours per week.

**ACC 231****Cost Accounting I**

3 credits

Studies cost accounting methods and reporting as applied to job order, process, and standard cost accounting systems. Includes cost control and other topics. Prerequisite: ACC 212 or equivalent. Lecture 3 hours per week.

**ACC 241****Auditing I**

3 credits

Presents techniques of investigating, interpreting, and appraising accounting records and assertions. Studies internal control design and evaluation, evidence-gathering techniques and other topics. Prerequisite: ACC 212 or equivalent. Lecture 3 hours per week.

**ACC 261****Principles of Federal Taxation I**

3 credits

Presents the study of federal taxation as it relates to individuals and related entities. Includes tax planning, compliance, and reporting. Lecture 3 hours per week.

**ACC 262****Principles of Federal Taxation II**

3 credits

Presents the study of federal taxation as it relates to partnerships, corporations, and other tax entities. Includes tax planning, compliance, and reporting. Lecture 3 hours per week.

## Acquisition and Procurement

**ACQ 121****Introduction to Acquisition and Procurement Fundamentals I**

3 credits

Introduces technical and fundamental procedures of government acquisition and procurement. Focuses on appropriations and funding, competition requirements, types of specifications, small business and labor surplus areas, pre-solicitation considerations, solicitations, and contractor qualifications. Lecture 3 hours per week.

**ACQ 122****Introduction to Acquisition and Procurement Fundamentals II**

3 credits

Presents technical and fundamental procedures basic to government acquisition and procurement. Focuses on sealed

bidding, types of contracts, pricing policies and techniques, contracting by negotiation, contract administration, contractor performance, government contract quality assurance, termination of government contracts, protest, disputes, appeals, and contract close-out. Prerequisite: ACQ 121. Lecture 3 hours per week.

**ACQ 215****Contract Law**

3 credits

Studies government contract law. Applies basic legal aspects and principles of law associated with contracting and the administration of contracts. Emphasizes the dispute process, including administrative and judicial methods of resolution of contract disputes. Focuses on modifications, award law, government property, defective pricing data, patent and data law, and labor law. Lecture 3 hours per week.

**ACQ 221****Advanced Acquisition and Procurement Management I**

3 credits

Studies advanced areas of acquisition planning, government provided property, sealed bidding, funding, and acquisition of information resources. Emphasizes interactions with service contracts, value engineering, commercial activities, technical requirements, construction requirements, and socio-economic programs. Prerequisite: ACQ 121. Lecture 3 hours per week.

**ACQ 231****Principles of Contract Pricing and Negotiations I**

3 credits

Covers the environment in which cost and price analysis takes place, sources of data for cost and price analysis, methods for analyzing direct and indirect costs, methods for performing profit analysis, and a selection of current pricing topics. Lecture 3 hours per week.

**ACQ 232**  
**Principles of Contract Pricing and Negotiations II**  
 3 credits

Continues the environment in which cost and price analysis takes place. Includes individual and group negotiation activities, which address the fundamentals of the negotiation process, essential techniques, strategies, and tactics. Prerequisite: ACQ 231. Lecture 3 hours per week.

**Administration of Justice**

**ADJ 105**  
**The Juvenile Justice System**  
 3 credits

Presents the evolution, philosophy, structures and processes of the American juvenile delinquency system; surveys the rights of juveniles, dispositional alternatives, rehabilitation methods and current trends. Lecture 3 hours per week.

**ADJ 110**  
**Introduction to Law Enforcement**  
 3 credits

Studies the philosophy and history of law enforcement, presenting an overview of the crime problem and policy response issues. Surveys the jurisdictions and organizations of local, state, and federal law enforcement agencies. Examines the qualification requirements and career opportunities in the law enforcement profession. Lecture 3 hours per week.

**ADJ 111**  
**Law Enforcement Organization and Administration I**  
 3 credits

Teaches the principles of organization and administration of law enforcement agencies. Studies the management of line operations, staff and auxiliary services investigative and juvenile units. Introduces the concept of data processing; examines policies, procedures, rules, and regulations pertaining to crime prevention. Surveys concepts of

protection of life and property, detection of offenses, and apprehension of offenders. Lecture 3 hours per week.

**ADJ 140**  
**Introduction to Corrections**  
 3 credits

Focuses on societal responses to the offender. Traces the evolution of practices based on philosophies of retribution, deterrence, and rehabilitation. Reviews contemporary correctional activities and their relationships to other aspects of the criminal justice system. Lecture 3 hours per week.

**ADJ 201**  
**Criminology**  
 3 credits

Studies current and historical data pertaining to criminal and other deviant behavior. Examines theories that explain crime and criminal behavior in human society. Lecture 3 hours per week.

**ADJ 211-212**  
**Criminal Law, Evidence and Procedures I-II**  
 3 credits each

Teaches the elements of proof for major and common crimes and the legal classification of offenses. Studies the kinds, degrees and admissibility of evidence and its presentation in criminal proceedings with emphasis on legal guidelines for methods and techniques of evidence acquisition. Surveys the procedural requirements from arrest to final disposition in the various American court systems with focus on the Virginia jurisdiction. Lecture 3 hours per week.

**ADJ 231**  
**Community Policing**  
 3 credits

Examines the history of police-community relations and the role of both the community and the police in establishing a crime fighting partnership for success. Emphasizes building relationships between police officers and the community they serve. Includes case studies from various cities that have undertaken the philosophy of community policing. Lecture 3 hours per week.

**ADJ 232**  
**Domestic Violence**  
 3 credits

Surveys historical issues that have affected family violence. Examines current trends in the context of the criminal justice system. Lecture 3 hours per week.

**ADJ 234**  
**Terrorism and Counter-Terrorism**  
 3 credits

Surveys the historical and current practices of terrorism that are national, transnational, or domestic in origin. Includes biological, chemical, nuclear, and cyber-terrorism. Teaches the identification and classification of terrorist organizations, violent political groups and issue-oriented militant movements. Examines investigative methods and procedures utilized in counter terrorist efforts domestically and internationally. Lecture 3 hours per week.

**ADJ 236**  
**Principles of Criminal Investigation**  
 3 credits

Surveys the fundamentals of criminal investigation procedures and techniques. Examines crime scene search, collecting, handling and preserving of evidence. Lecture 3 hours per week.

**ADJ 247**  
**Criminal Behavior**  
 3 credits

Introduces and evaluates the concepts of normal and abnormal behavior. Focuses on the psychological and sociological aspects of criminal and other deviant behavior patterns. Lecture 3 hours per week.

## Air Conditioning and Refrigeration

### AIR 111-112

#### Air Conditioning and Refrigeration Controls I-II

3 credits each

Presents electron theory, magnetism, Ohm's Law, resistance, current flow, instruments for electrical measurement, AC motors, power distribution controls and their application. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### AIR 116

#### Duct Construction and Maintenance

2 credits

Presents duct materials including sheet metal, aluminum, and fiber glass. Explains development of duct systems, layout methods, safety hand tools, cutting and shaping machines, fasteners and fabrication practices. Includes duct fittings, dampers and regulators, diffusers, heater and air washers, fans, insulation, and ventilating hoods. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

### AIR 121-122

#### Air Conditioning and Refrigeration I-II

3 credits each

Studies refrigeration theory, characteristics of refrigerants, temperature, and pressure, tools and equipment, soldering, brazing, refrigeration systems, system components, compressors, evaporators, metering devices. Presents charging and evaluation of systems and leak detection. Explores servicing the basic system. Explains use and care of oils and additives and troubleshooting of small commercial systems. Presents operations of commercial refrigeration systems, ice machines, design, installation and service, air conditioning and heat pumps. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### AIR 154

#### Heating Systems I

3 credits

Introduces types of fuels and their characteristics of combustion; types, components and characteristics of burners, and burner efficiency analyzers. Studies forced air heating systems including troubleshooting, preventive maintenance and servicing. Co-requisite: AIR 111. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### AIR 161

#### Heating, Air, and Refrigeration Calculations I

3 credits

Introduces fractions, decimals, sign of operations, equations, Ohm's law, subtraction, multiplication and division of signed numbers. Teaches fundamentals of algebra, expression of stated problems in mathematical form, and solutions of equations. Lecture 3 hours per week.

### AIR 165

#### Air Conditioning Systems I

3 credits

Introduces comfort survey, house construction, load calculations, types of distribution systems, and equipment selection. Introduces designing, layout, installing and adjusting of duct systems, job costs, and bidding of job. Prerequisite: AIR 161. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### AIR 181

#### Planning and Estimating I

2 credits

Presents fundamentals of blueprint reading as applied to the building trades. Emphasizes air conditioning distribution, designing and drawing residential and commercial systems, take-off of materials and estimating the cost of the systems. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

### AIR 200

#### Hydronics

2 credits

Presents design and installation of hydronic systems for heating and cooling. Includes steam heated and chilled water systems. Primarily concerns systems using water under forced circulation. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

### AIR 206

#### Psychrometrics

3 credits

Studies air and its properties, characteristics and measurements as they apply to human comfort. Considers control of temperature, humidity and distribution of air and air mixtures. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### AIR 235

#### Heat Pumps

3 credits

Studies theory and operation of reverse cycle refrigeration, including supplementary heat as applied to heat pump systems, service, installation and maintenance. Prerequisites: AIR 112 and AIR 122. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### AIR 238

#### Advanced Troubleshooting and Service

3 credits

Presents advanced service techniques on a wide variety of equipment used in refrigeration, air conditioning, and phases of heating and ventilation and controls. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

## Architecture

### ARC 100

#### Introduction to Architecture

3 credits

Outlines history and impact of architecture. Emphasizes dynamics and social aspects of architecture and society; focuses on 19th and 20th century architectural forms. Lecture 3 hours per week.

### ARC 121 -122

#### Architectural Drafting I-II

3 credits each

Introduces techniques of architectural drafting, including lettering, dimensioning, and symbols. Requires production of plans, sections, and elevations of a simple building. Studies use of common reference material and the organization of architectural working drawings. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### ARC 133

#### Construction Methodology and Procedures I

3 credits

Studies materials used in construction of buildings, covering foundations to structural framing systems. Includes appropriate use of materials for various construction types. Lecture 3 hours per week.

### ARC 220

#### Introduction to Landscape Architecture and Site Planning

3 credits

Introduces the basics of landscape design and development concepts through architectural construction and plantings. Shows relationship between design and environment, including objectives of design elements and materials, and facilities. Lecture 3 hours per week.

### ARC 221

#### Architectural CAD Applications Software I

3 credits

Teaches the principles and techniques of architectural drawing practices through the use of architecture specific CAD software. Utilizes the commands and features of the software to generate drawings that emphasize architectural design and structural systems. Prerequisite: DRF 201. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### ARC 258

#### Building Codes, Contract Documents and Professional Office Practices

3 credits

Covers professional role of the architectural technician with regard to the construction industry. Includes building codes and their effect on specifications and drawings. Teaches purpose and writing of specifications with their legal and practical application to working drawings. Analyzes contract documents for client-architect-contractor responsibilities and duties. Lecture 3 hours per week.

## Art

### ART 110

#### Advertising Copy Writing

2 credits

Presents basic promotional copy writing skills. Includes persuasion, creativity, marketplace dynamics and media format. Challenges the student to develop creative thinking styles which take form in the written word. Prerequisite: ENG 111. Lecture 2 hours per week.

### ART 114

#### General Art

3 credits

Introduces art to the student without previous training. Provides studio exercises in drawing, painting, and two- and three-dimensional design. Lecture 2 hours. Studio instruction 3 hours. Total 5 hours per week.

### ART 121-122

#### Drawing I-II

3 credits each

Develops basic drawing skills and understanding of visual language through studio instruction/lecture. Introduces concepts such as proportion, space, perspective, tone and composition as applied to still life, landscape and the figure. Uses drawing media such as pencil, charcoal, ink wash and color media. Includes field trips and gallery assignments as appropriate. Must be taken in sequence. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

### ART 133

#### Visual Arts Foundation

4 credits

Covers tools and techniques, design concepts and principles, color theory and an introduction to the computer for graphic use. Applies to all fields of visual art. Co-requisite: SDV 101 Orientation to Visual Arts. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.

### ART 134

#### Three-Dimensional Design

3 credits

Explores the concepts of three-dimensional design applicable to all fields of visual art. Covers tools and techniques. Uses computers as appropriate for research. Prerequisite: ART 133. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

### ART 141

#### Typography I

4 credits

Studies the history of letter forms and typefaces and examines their uses in contemporary communications media. Emphasizes applications to specific design problems. Includes identification and specification of type, copy fitting and hands-on typesetting problems. Prerequisite: ART 133 or divisional approval. Must be taken in sequence. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.

**ART 201-202  
History of Art I-II****3 credits each**

Studies the historical context of art of the ancient, medieval, Renaissance and modern worlds. Includes research project. Lecture 3 hours per week.

**ART 203  
Animation I****4 credits**

Introduces the student to the basic techniques of animation, both traditional and computer generated. Teaches theoretical elements of the aesthetics of sequential imagery. Provides practical experience in animation. Exposes students to a variety of animation techniques through lectures, presentations, classroom work, and outside assignments. Prerequisites: ART 122, ART 133, and ART 283. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**ART 208  
Video Techniques****4 credits**

Addresses the fundamentals of video technology as applied to the creation of multimedia projects. Focuses on the aesthetics of editing. Extends the capabilities of graphic designers and artists and allows them to transfer art work and animation from the computer to video, and to capture video frames for use in multimedia design on the computer. Instructs a student in the development of sophisticated typographic design. Prerequisite: ART 283. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**ART 221-222  
Drawing III-IV****3 credits each**

Introduces advanced concepts and techniques of drawing as applied to the figure, still life and landscape. Gives additional instruction in composition, modeling, space and perspective. Encourages individual approaches to drawing. Must be taken in sequence. Prerequisite: ART 122. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

**ART 241-242  
Painting I-II****3 credits each**

Introduces abstract and representational painting in acrylic and/or oil with emphasis on color composition and value. Must be taken in sequence. Prerequisites: ART 122 and ART 133 or divisional approval. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

**ART 243-244  
Watercolor I-II****3 credits each**

Presents abstract and representational painting in watercolor with emphasis on design, color, composition, technique and value. Prerequisites: ART 122 and ART 133 or divisional approval. Must be taken in sequence. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

**ART 251-252  
Communication Design I-II****3 credits each**

Studies the principles of visual communications as applied to advertising in newspapers, magazines, direct mail advertising, house organs, etc. Analyzes the influence of contemporary art on design. Must be taken in sequence. Prerequisite: ART 133. Lecture 2 hours. Studio instruction 2 hours. Total 4 hours per week.

**ART 263-264  
Interactive Design I-II****4 credits each**

Focuses on creative concepts of design problem solving for interactive design: techniques specific to web, multimedia for the web, and other interactive design products. Advanced interactive design functions such as animation, rollovers, and audio are covered in ART 264. Prerequisites for ART 263: ART 141 and ART 283. Prerequisites for ART 264: ART 263, ART 203, and ART 208. Lecture 2 hours. Studio instruction 2 hours. Total 4 hours per week.

**ART 283-284  
Computer Graphics I-II****4 credits each**

Introduces microcomputers and software used to produce computer graphics. Employs techniques learned to solve studio projects which reinforce instruction and are appropriate for portfolio use. Must be taken in sequence. Co-requisite: ART 133. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.

**ART 287  
Portfolio and Resume Preparation****2 credits**

Focuses on portfolio preparation, resume writing, and job interviewing for students. Recommended for final semester program students. Requires instructor's approval. Lecture 1 hour. Studio instruction 2 hours. Total 3 hours per week.

**American Sign Language****ASL 101-102  
American Sign Language I-II****3 credits each**

Introduces the fundamentals of American Sign Language (ASL) used by the Deaf Community, including basic vocabulary, syntax, finger spelling, and grammatical non-manual signals. Focuses on communicative competence. Develops gestural skills as a foundation for ASL enhancement. Introduces cultural knowledge and increases understanding of the Deaf Community. Lecture 3 hours per week.

**ASL 115  
Finger Spelling and Number Use in ASL****2 credits**

Provides intensive practice in comprehension and production of finger spelled words and numbers with emphasis on clarity and accuracy. Focuses on lexicalized finger spelling and numeral incorporation as used by native users of American Sign Language. Prerequisite: ASL 101 or permission of instructor. Lecture 2 hours per week.

**ASL 125**  
**History & Culture of the Deaf**  
**Community I**

3 credits

Presents an overview of various aspects of Deaf Culture, including educational and legal issues. Prerequisite: ASL 101. Lecture 3 hours per week.

**ASL 150**  
**Working with Deaf and**  
**Hard-of-Hearing People**

2 credits

Explores career options for serving Deaf/hard-of-hearing people and/or for using American Sign Language skills in a career. Examines interests, skills, and educational assessments. Investigates job market viability via the Internet and professional periodicals. Develops opportunities for students to network with professionals in the field of deafness. Lecture 2 hours per week.

**ASL 201-202**  
**American Sign Language III-IV**

3 credits each

Develops vocabulary, conversational competence, and grammatical knowledge with a total immersion approach. Introduces increasingly complex grammatical aspects including those unique to ASL. Discusses culture and literature. Contact with the Deaf Community is encouraged to enhance linguistic and cultural knowledge. Prerequisite: ASL 102 or permission of instructor. Lecture 3 hours per week.

**ASL 220**  
**Comparative Linguistics: ASL & English**

3 credits

Describes spoken English and ASL (American Sign Language) on five levels: phonological, morphological, lexical, syntactic, and discourse. Compares and contrasts the two languages on all five levels using real-world examples. Documents similarities between signed languages and spoken languages in general. Describes the major linguistic components and processes of English and ASL. Introduces basic theories regarding ASL structure.

Emphasizes ASL's status as a natural language by comparing and contrasting similarities and unique differences between the two languages. Prerequisite: ASL 201. Lecture 3 hours per week.

**ASL 261-262**  
**American Sign Language V-VI**

3 credits each

Develops advanced American Sign Language comprehension and production skills. Emphasizes advanced linguistic aspects of ASL. Presents ASL literary forms. Encourages contact with the Deaf Community. Prerequisite: ASL 202. Lecture 3 hours per week.

**Administrative**  
**Support Technology**

**AST 55**  
**Certification Preparation**

1 credit

Serves as a review of objectives for a specific Certification. Uses certification test preparation software, when available, in conjunction with a faculty resource person. May be repeated for credit. Lecture 1 hour per week.

**AST 101**  
**Keyboarding I**

3 credits

Teaches the alpha/numeric keyboard with emphasis on correct techniques, speed, and accuracy. Teaches formatting of basic personal and business correspondence, reports, and tabulation. Lecture 3 hours per week.

**AST 102**  
**Keyboarding II**

3 credits

Develops keyboarding and document production skills with emphasis on preparation of specialized business documents. Continues skill-building for speed and accuracy. Prerequisite: AST 101. Lecture 3 hours per week.

**AST 107**  
**Editing/Proofreading Skills**

3 credits

Develops skills essential to creating and editing business documents. Covers grammar, spelling, diction, punctuation, capitalization, and other usage problems. Lecture 3 hours per week.

**AST 114**  
**Keyboarding for Information Processing**

2 credits

Teaches the alphabetic and numeric keys; develops correct techniques and competency in the use of computer keyboards. May include basic correspondence and report formats. A laboratory co-requisite (AST 115) may be required. Lecture 2 hours per week.

**AST 117**  
**Keyboarding for Computer Usage**

1 credit

Teaches the alphabetic keyboard and 10-key pad. Develops correct keying techniques. Lecture 1 hour per week.

**AST 132**  
**Word Processing I**  
**(Microsoft Office Word)**

1 credit

Introduces students to a word processing program to create, edit, save and print documents. Lecture 1 hour per week.

**AST 141**  
**Word Processing**  
**(Microsoft Office Word)**

4 credits

Teaches creating and editing documents, including line and page layouts, columns, fonts, search/replace, cut/paste, spell/thesaurus, and advanced editing and formatting features of word processing software. Prerequisite: AST 101 or equivalent. Lecture 4 hours per week.

**AST 147****Introduction to Presentation Software (Microsoft Office PowerPoint)**

1 credit

Introduces presentation options including slides, transparencies, and other forms of presentations. Lecture 1 hour per week.

**AST 150****Desktop Publishing I (Microsoft Office Word)**

1 credit

Presents desktop publishing features including page layout and design, font selection, and use of graphic images. Lecture 1 hour per week.

**AST 154****Introduction to Voice Recognition Software**

1 credit

Teaches the computer user to use the voice as an input device to compose documents and to give commands directly to the computer. Lecture 1 hour per week

**AST 201****Keyboarding III**

3 credits

Develops decision-making skills, speed, and accuracy in production keying. Applies word processing skills in creating specialized business documents. Prerequisite: AST 102 or equivalent. Lecture 3 hours per week.

**AST 205****Business Communications**

3 credits

Teaches techniques of oral and written communications. Emphasizes writing and presenting business-related material. Prerequisite: ENG 111. Lecture 3 hours per week.

**AST 234****Records and Database Management**

3 credits

Teaches filing and records management procedures using microcomputer database software. Incorporates both manual and electronic methods for managing information. Lecture 3 hours per week.

**AST 236****Specialized Software Applications**

4 credits

Teaches specialized integrated software applications on the microcomputer. Emphasizes document production to meet business and industry standards. Prerequisite: AST 101 or equivalent. Lecture 4 hours per week.

**AST 243****Office Administration I**

3 credits

Develops an understanding of the administrative support role and the skills necessary to provide organizational and technical support in a contemporary office setting. Emphasizes the development of critical thinking, problem-solving, and job performance skills in a business office environment. Prerequisite: AST 101 or equivalent. Lecture 3 hours per week.

**AST 244****Office Administration II**

3 credits

Enhances skills necessary to provide organizational and technical support in a contemporary office setting. Emphasizes administrative and supervisory role of the office professional. Includes travel and meeting planning, office budgeting and financial procedures, international issues, and career development. Prerequisite: AST 243 or equivalent. Lecture 3 hours per week.

**AST 245****Medical Machine Transcription**

3 credits

Develops machine transcription skills, integrating operation of transcribing equipment with understanding of medical terminology. Emphasizes dictation techniques and accurate transcription of medical documents in prescribing formats. Prerequisite: AST 102 or equivalent and HLT 143. Lecture 3 hours per week.

**AST 257****WP Desktop Publishing (Microsoft Office Word)**

3 credits

Uses word processing software to teach advanced document preparation. Prerequisite: AST 101 or equivalent and experience in using Microsoft Word 2003. Lecture 3 hours per week.

**AST 271****Medical Office Procedures I**

3 credits

Covers medical office procedures, records management, preparation of medical reports, and other medical documents. Co-requisite: AST 102 should be taken prior to or with AST 271. Lecture 3 hours per week.

## Automotive

**AUT 101****Introduction to Automotive Systems**

3 credits

Introduces fundamental systems of the automobile: the engine, fuel, exhaust, electric, ignition, lubrication, cooling, transmission, steering, brake and suspension systems. Teaches theory and function of each system. Demonstrates operation. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**AUT 156****Small Gasoline Engines**

2 credits

Studies small gasoline engine operating principles, construction, design, variety, and their many purposes. Gives instruction on two-cycle and four-cycle small gas engines, their construction, design, fuel system, ignition system, and lubricating systems. Demonstrates disassembly, reconditioning, overhaul and reassembly in the lab. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**AUT 165****Automotive Diagnosis and Tune-Up**

2 credits

Presents the techniques for diagnosis of malfunctions in systems of the automobile. Uses dynamometers, oscilloscopes and other specialized diagnostic and testing equipment. Demonstrates tune-up of conventional and rotary engines. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**AUT 166-167****Automotive Diagnostics I-II**

5 credits each

Presents the application and operating theory and diagnostic procedures on general engine mechanical and electrical systems. Emphasizes diagnostic procedures using the latest diagnostic equipment. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

**AUT 168-169****Automotive Diagnostics III-IV**

5 credits each

Presents the application and operating theory and diagnostic procedures on engine performance systems, emissions analysis, computer controlled systems, body electronics, and climate control systems. Emphasizes diagnostic procedures using the latest diagnostic equipment. Includes preparation for Refrigerant Certification Test and ASE Tests A6, A7, A8. Prerequisite: AUT 167. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

**AUT 220-221****Automotive Diagnostics V-VI**

5 credits each

Presents the application and operation of diagnostic test equipment to test and inspect steering, suspension, and braking systems. Includes preparation for Virginia State Inspection Exam and ASE Tests A4, A5. Prerequisite: AUT 166. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

**AUT 247-248****Automotive Diagnostics VII-VIII**

5 credits each

Presents the application and operation of diagnostic test equipment to test and inspect power train systems. Includes preparation for ASE Tests A1, A2, and A3. Prerequisite: AUT 166. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

**Biology****BIO 1****Foundations of Biology**

3 credits

Develops a basic understanding of plant and animal form, function and relationships. Prepares students who have a deficiency in high school biology. May be repeated for credit. Lecture 3 hours per week.

**BIO 100****Basic Human Biology**

3 credits

Presents basic principles of human anatomy and physiology. Discusses cells, tissues, and selected human systems. Lecture 3 hours per week.

**BIO 101-102****General Biology I-II**

4 credits each

Explores fundamental characteristics of living matter from the molecular level to the ecological community with emphasis on general biological principles. Introduces the diversity of living organisms, their structure, function and evolution. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.

**BIO 141-142****Human Anatomy and Physiology I-II**

4 credits each

Integrates anatomy and physiology of cells, tissues, organs, and systems of the human body. Integrates concepts of chemistry, physics, and pathology. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.

**BIO 150****Introductory Microbiology**

4 credits

Studies the general characteristics of microorganisms. Emphasizes their relationships to individual and community health. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.

**BIO 270****General Ecology**

4 credits

Studies interrelationships between organisms and their natural and cultural environments with emphasis on populations, communities, and ecosystems. Prerequisites: BIO 101-102 or divisional approval. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.

**BIO 275****Marine Ecology**

4 credits

Applies ecosystem concepts to marine habitats. Includes laboratory and field work. Prerequisite: BIO 101-102 or divisional approval. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.

**BIO 278****Coastal Ecology**

3 credits

Investigates beach, salt marsh, and estuarine ecosystems, including the effects of chemical, geological, and physical factors upon the distribution of organisms. Discusses the effects of pollution and human manipulation of the coastline. Includes observation and identification of coastal plants and animals, and analysis of the dynamics of coastal community structure and function in a field-based setting. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

## Business Management and Administration

### BUS 100

#### Introduction to Business 3 credits

Presents a broad introduction to the functioning of business enterprise within the U.S. economic framework. Introduces economic systems, essential elements of business organization, production, human resource management, marketing, finance, and risk management. Develops business vocabulary. Lecture 3 hours per week.

### BUS 111

#### Principles of Supervision 3 credits

Teaches the fundamentals of supervision, including the primary responsibilities of the supervisor. Introduces factors relating to the work of supervisor and subordinates. Covers aspects of leadership, job management, work improvement, training and orientation, performance evaluation, and effective employee/supervisor relationships. Lecture 3 hours per week.

### BUS 117

#### Leadership Development 3 credits

Covers interpersonal relations in hierarchical structures. Examines the dynamics of teamwork, motivation, handling change and conflict and how to achieve positive results through others. Lecture 3 hours per week.

### BUS 125

#### Applied Business Mathematics 3 credits

Applies mathematical operations to business process and problems such as wages and payroll, sales and property taxes, checkbook records and bank reconciliation, depreciation, overhead, distribution of profit and loss in partnerships, distribution of corporate dividends, commercial discounts, markup, markdown, simple interest, present values, bank discount notes, multiple payment plans, compound interest annuities, sinking funds, and amortization. Prerequisite: MTH 121. Lecture 3 hours per week.

### BUS 130

#### Maritime Logistics Afloat 3 credits

Examines the technician and mid-level management responsibilities required to perform all tasks relative to maritime logistics operations afloat using current occupational standards for Logisticians. Discusses the three major topic areas in the Naval Supply System of Inventory, logistics, and financial management. Lecture 3 hours per week.

### BUS 131

#### Maritime Logistics Ashore 3 credits

Examines the technician and mid-level management responsibilities required to perform all tasks relative to ashore maritime logistics. Focuses on current occupational standards for Logisticians. Discusses the three major topic areas in the Naval Supply System of Inventory, logistics, and financial management. Lecture 3 hours per week.

### BUS 160

#### Legal Aspects of Small Business Operations 1 credit

Covers the functional areas of business law, specifically as it applies to small business. Provides the students with a working knowledge of business contracts, agency relationships, and product liability. Provides a knowledge base for small business owners to overcome problems that are individually within their abilities. Covers selection of professional assistance for problems of a more serious nature. Lecture 1 hour per week.

### BUS 165

#### Small Business Management 3 credits

Identifies management concerns unique to small businesses. Introduces the requirements necessary to initiate a small business, and identifies the elements comprising a business plan. Presents information establishing financial and administrative controls, developing a marketing strategy, managing business

operations, and the legal and government relationships specific to small businesses. Lecture 3 hours per week.

### BUS 200

#### Principles of Management 3 credits

Teaches management and the management functions of planning, organizing, leading and controlling. Focuses on application of management principles to realistic situations managers encounter as they attempt to achieve organizational objectives. Prerequisite: BUS 100. Lecture 3 hours per week.

### BUS 201

#### Organizational Behavior 3 credits

Presents a behaviorally oriented course combining the functions of management with the psychology of leading and managing people. Focuses on the effective use of human resources through understanding human motivation and behavior patterns, conflict management and resolution, group functioning and process, the psychology of decision-making, and the importance of recognizing and managing change. Lecture 3 hours per week.

### BUS 202

#### Applied Management Principles 3 credits

Focuses on management practices and issues. May use case studies and/or management decision models to analyze problems in developing and implementing a business strategy while creating and maintaining competitive advantage. Prerequisite: BUS 200. Lecture 3 hours per week.

### BUS 205

#### Human Resource Management 3 credits

Introduces employment, selection, and placement of personnel, forecasting, job analysis, job descriptions, training methods and programs, employee evaluation systems, compensation, benefits, and labor relations. Lecture 3 hours per week.

**BUS 215**  
**Purchasing and Materials Management**  
3 credits

Teaches the principles of effective purchasing and management of materials and equipment. Includes determination of requirements, source selection, pricing, value analysis, contracting, inventory management, and equipment requisition decisions. Lecture 3 hours per week.

**BUS 216**  
**Probability and Statistics for Business and Economics**  
3 credits

Introduces methods of probability assessment and statistical inference. Includes data collection and presentation; descriptive statistics; basic probability concepts; discrete and continuous probability distributions; decision theory; sampling and estimation; and hypotheses testing. Emphasizes business and economic applications. Utilizes computer software as a tool for problem solving. Prerequisites: ITE 115 and MTH 163. Lecture 3 hours per week.

**BUS 220**  
**Introduction to Business Statistics**  
3 credits

Introduces statistics as a tool in decision-making. Emphasizes ability to collect, present, and analyze data. Employs measures of central tendency and dispersion, statistical inference, index numbers, probability theory, and time series analysis. Prerequisite: MTH 121. Lecture 3 hours per week.

**BUS 223**  
**Distribution and Transportation**  
3 credits

Examines the background and history of transportation, emphasizing the fundamental role and importance the industry plays in companies, society, and the environment in which transportation service is provided. Provides an overview of carrier operations, management, technology, and strategies including transportation regulations and public policy. Lecture 3 hours per week.

**BUS 234**  
**Supply Chain Management**  
3 credits

Examines the process of planning, organizing, and controlling the flow of materials and services from supplier to end users/customers. Focuses on coordinating supply management, operations and integrated logistics into a seamless pipeline to maintain a continual flow of products and services. Lecture 3 hours per week.

**BUS 236**  
**Communication in Management**  
3 credits

Introduces the functions of communication in management with emphasis on gathering, organizing, and transmitting facts and ideas. Teaches the basic techniques of effective oral and written communication. Lecture 3 hours per week.

**BUS 241**  
**Business Law I**  
3 credits

Develops a basic understanding of the US business legal environment. Introduces property and contract law, agency and partnership liability, and government regulatory law. Students will be able to apply these legal principles to landlord/tenant disputes, consumer rights issues, employment relationships, and other business transactions. Lecture 3 hours per week.

**BUS 242**  
**Business Law II**  
3 credits

Focuses on business organization and dissolution, bankruptcy and Uniform Commercial Code. Introduces international law and the emerging fields of E-Commerce and Internet Law. Lecture 3 hours per week.

**BUS 255**  
**Inventory and Warehouse Management**  
3 credits

Emphasizes the relationships of inventory and warehouse management to customer service and profitability of the wholesale distributor. Focuses on the role of computerized systems and resulting

information for effective management of inventory and the warehouse under various conditions. Lecture 3 hours per week.

**BUS 260**  
**Planning for Small Business**  
2 credits

Provides knowledge of the development of a business plan, which can be used to acquire capital and serve as a management guide. Combines knowledge that has been acquired in the areas of planning, management, and finance using Performance statements and marketing. Covers Internet searching techniques. Recommended as a capstone course. Lecture 2 hours per week.

**BUS 265**  
**Ethical Issues in Management**  
3 credits

Examines the legal, ethical, and social responsibilities of management. May use cases to develop the ability to think and act responsibly. Lecture 3 hours per week.

**BUS 280**  
**Introduction to International Business**  
3 credits

Studies the problems, challenges, and opportunities, which arise when business operations or organizations transcend national boundaries. Examines the functions of international business in the economy, international and transnational marketing, production, and financial operations. Lecture 3 hours per week.

## Childhood Development

**CHD 109**  
**Music and Movement for Children**  
3 credits

Emphasizes theory and practice in movement and music education and the integration of these skills in a curriculum. Designed for teachers and aides in child care, preschool, nursery, or primary schools. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**CHD 117****Introduction To Reading Methods**

3 credits

Introduces current practices of teaching reading in the elementary school. Familiarizes students with materials currently in use, emphasizes observation of various reading techniques and trends in the classroom. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**CHD 118****Language Arts for Young Children**

3 credits

Presents techniques and methods for encouraging the development of language and perceptual skills in young children. Stresses improvement of vocabulary, speech, and methods to stimulate discussion. Surveys children's literature, examines elements of quality story telling and story reading, and stresses the use of audio-visual materials. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**CHD 120****Introduction to Early Childhood Education**

3 credits

Introduces early childhood development through activities and experiences in nursery, pre-kindergarten, kindergarten, and primary programs. Investigates classroom organization and procedures, and use of classroom time and materials, approaches to education for young children, professionalism, and curricular procedures. Lecture 3 hours per week.

**CHD 125****Creative Activities for Children**

3 credits

Prepares individuals to work with young children in the arts and other creative age-appropriate activities. Investigates affective classroom experiences and open-ended activities. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**CHD 126****Science and Math Concepts for Children**

3 credits

Covers the selection of appropriate developmental learning materials for developing activities to stimulate logical thinking skills in children. Lecture 3 hours per week.

**CHD 166****Infant and Toddler Programs**

3 credits

Examines the fundamentals of infant and toddler development, including planning and implementing programs in group care. Emphasizes meeting physical, social, emotional, and cognitive needs: scheduling, preparing age-appropriate activities, health and safety policies, record keeping, and reporting to parents. Lecture 3 hours per week.

**CHD 205****Guiding the Behavior of Children**

3 credits

Explores positive ways to build self-esteem in children and help them develop self-control. Presents practical ideas for encouraging pro-social behavior in children and emphasizes basic skills and techniques in classroom management. Lecture 3 hours per week.

**CHD 210****Introduction to Exceptional Children**

3 credits

Reviews the history of education for exceptional children. Studies the characteristics associated with exceptional children. Explores positive techniques for managing behavior and adapting materials for classroom use. Lecture 3 hours per week.

**CHD 220****Introduction to School-Age Child Care**

3 credits

Examines the purposes of school-age child care in today's society, the role of adults within school-age child care, and the state of the profession of school-age child care. Lecture 3 hours per week.

**CHD 225****Curriculum Development for School-Age Child Care**

3 credits

Explores the creative activities, techniques, interactions, and program development that promote positive social and emotional growth in school-age children. Emphasizes positive development through everyday programming and experiences. Lecture 3 hours per week.

**CHD 230****Behavior Management for School-Age Child Care**

3 credits

Discusses the development of social skills that school-age children need for self-management, including self-discipline, self-esteem, and coping with stress and anger. Explores ways to effectively guide and discipline school-age children, focusing on how adults can facilitate positive pro-social and self-management skills. Lecture 3 hours per week.

**CHD 235****Health and Recreation for School-Age Child Care**

3 credits

Examines the physical growth of school-age children and the role of health and recreation in school-age child development. Explores the use of medication, misuse of drugs, health issues of children, and the availability of community resources. Lecture 3 hours per week.

**CHD 270****Administration of Childcare Programs**

3 credits

Examines the skills needed for establishing and managing early childhood programs. Emphasizes professionalism and interpersonal skills, program planning, staff selection and development, creating policies, budgeting, and developing forms for record keeping. Lecture 3 hours per week.

## Chemistry

### CHM 1 Chemistry

4 credits

Presents basic inorganic and organic principles to students with little or no chemistry background. Can be taken in subsequent semesters as necessary until course objectives are completed. Lecture 4 hours per week.

### CHM 111-112 College Chemistry I-II

4 credits each

Explores the fundamental laws, theories, and mathematical concepts of chemistry. Designed primarily for science and engineering majors. Requires a strong background in mathematics. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

### CHM 121-122 Health Science Chemistry I-II

4 credits each

Introduces the health science student to concepts of inorganic, organic, and biological chemistry as applicable to the allied health profession. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

### CHM 241-242 Organic Chemistry I-II

3 credits each

Designed for chemistry and chemical engineering majors. Introduces fundamental chemistry of carbon compounds, including structures, physical properties, syntheses, and typical reactions. Emphasizes reaction mechanism. Co-requisites: CHM 243-244. Lecture 3 hours per week.

### CHM 243-244 Organic Chemistry Laboratory I-II

1 credit each

Includes qualitative organic analysis. Shall be taken concurrently with CHM 241 and CHM 242. Laboratory 3 hours per week.

## Civil Engineering Technology

### CIV 110 Introduction to Civil Engineering Technology

2 credits

Introduces basic skills required for a career in civil engineering technology, focusing on the roles and responsibilities of the engineering team, professional ethics, problem solving with hand calculator and computer applications. Introduces civil engineering materials and analysis, standard laboratory procedures and reporting, and engineering graphics, including instruction in Computer Aided Drafting. Instructs students in oral presentation preparations and delivery. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

### CIV 115 Civil Engineering Drafting

3 credits

Introduces terminology and drafting procedures related to civil engineering. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### CIV 116 Topographic Drafting

3 credits

Focuses on the development of techniques for topographic data computation, topographic map preparation and interpretation. Includes preparation of maps from survey field data, satellite and aerial photography, and techniques for the use of color in topographic presentations. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### CIV 120 Masonry Technology

3 credits

Introduces the ASTM standards and the methodology of concrete masonry technology emphasizing mortar mix designs, field and laboratory testing, and typical field applications. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### CIV 135 Construction Management and Estimating

3 credits

Teaches the equipment and methods used in construction. Includes principles and economics of construction, planning and management, and principles of estimating primarily using highway and building project examples. Lecture 3 hours per week.

### CIV 171 Surveying I

3 credits

Introduces surveying equipment, procedures and computations including adjustment of instruments, distance measurement, leveling, angle measurement, traversing, traverse adjustments, area computations and introduction to topography. Prerequisite: MTH 115. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### CIV 172 Surveying II

3 credits

Introduces surveys for transportation systems, including the preparation and analysis of topographic maps, horizontal and vertical curves, earthwork and other topics related to transportation construction. Prerequisite: CIV 171 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### CIV 225 Soil Mechanics

2 credits

Focuses on soil in its relationship to engineering construction. Includes soil composition and structure, weight-volume relationships, sampling procedures, classification systems, water in soil, stresses, strains, bearing capacity, settlement and expansion, compaction, stabilization, and introduction to foundations and retaining walls. Co-requisite CIV 226. Lecture 2 hours per week.

**CIV 226****Soil Mechanics Laboratory**

1 credit

Introduces practical soil sampling; classification of unified, ASTM and ASSHTO specifications; laboratory testing of soils to predict engineering performance. Co-requisite: CIV 225. Laboratory 2 hours per week.

**CIV 228****Concrete Technology**

2 credits

Introduces properties of Portland cement concrete, methods of mix design and adjustment, transportation, placement and curing in accordance with ACI and PCA recommended procedures. Co-requisite: CIV 229. Lecture 2 hours per week.

**CIV 229****Concrete Laboratory**

1 credit

Focuses on mixing, curing, testing and quality control of concrete. Co-requisite: CIV 228. Laboratory 2 hours per week.

**CIV 235****Asphalt Technology**

2 credits

Introduces properties of bituminous materials with emphasis on asphalt cements used in construction, methods of asphalt cement concrete mix design, transportation, placement and curing. Co-requisite: CIV 236. Lecture 2 hours per week.

**CIV 236****Asphalt Laboratory**

1 credit

Focuses on testing and quality control of bituminous materials, mixing, testing and quality control of asphalt cements. Co-requisite: CIV 235. Laboratory 2 hours per week.

**CIV 240****Fluid Mechanics and Hydraulics**

3 credits

Introduces the principles of fluid flow and development of practical hydraulics resulting from study of fluid Statics, flow of real fluid in pipes, multiple pipe lines, liquid flow in open channels, and fluid measurement techniques. Prerequisite: MEC 131. Lecture 3 hours per week.

**CIV 256****Global Positioning Systems for Land Surveying**

3 credits

Introduces principles of satellite-based surveying and presents Global Positioning System (GPS) as it is utilized in land surveying and the various components of the GPS technology and the techniques through which the GPS technology may be used in land surveys. Utilizes field surveys using the GPS equipment as part of the laboratory activities. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**CIV 257****Mapping Standards, VA Rules and Statutes and Surveying Law**

3 credits

Presents both theory and practical mapping experience in the preparation of subdivision maps, records of surveys, topographic maps, route and rights-of-way maps. Covers the requirements of the Subdivision Map Act and the Land Surveyors Act. Presents techniques for the reduction of field survey notes and the preparation of improvement plans. Prepares students for areas of the Land Surveyors-in-Training and the State Land Surveyors examinations. Lecture 3 hours per week.

**CIV 258****Photogrammetry and Remote Sensing**

1 credit

Introduces principles of photogrammetry, geometry of photographs, flight planning, ground control, single and double image photogrammetry, stereoscopic plot, orthophoto, photogrammetric mapping, applications, and economic factors. Provides the student with the required background

preparation for areas of the State Land Surveyors Examination and the Land Surveyors-in-Training Examination devoted to this topic. Lecture 1 hour per week.

**CIV 259****Virginia Coordinate Systems**

1 credit

Provides an introduction to the theory of the Virginia Coordinate System and its application to modern surveying practices; conversion of geographical coordinates, zone conversion, and transversing of the grid. Provides the student with the required background and preparation for areas of the State Land Surveyors Examination and the Land Surveyors-in-Training Examination devoted to this topic. Lecture 1 hour per week.

**CIV 280****Introduction to Environmental Engineering**

3 credits

Introduces the engineering elements of water and wastewater treatment, water distribution and wastewater collection systems, solid and hazardous waste, erosion control, and storm water management. Lecture 3 hours per week.

**Crafts****CRF 101****Hand Built Pottery**

3 credits

Introduces fundamental concepts and skills related to hand crafted hand-built pottery. Prerequisite: CRF 105. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

**CRF 102****Wheel-Thrown Pottery**

3 credits

Introduces fundamental concepts and skills related to hand crafted wheel-thrown pottery. Prerequisite: CRF 105. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

**CRF 105**

**Introduction to Pottery**

3 credits

Introduces art and design related to pottery. Teaches techniques of hand-building, throwing on the potter's wheel, glaze techniques and experimental firing. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

**CRF 130**

**Glass Blowing I**

4 credits

Introduces a variety of techniques for manipulating molten "hot glass" into vessel or sculptural forms. Teaches studio safety, equipment operation, techniques of forming molten glass, annealing and cold working techniques. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**CRF 131**

**Glass Blowing II**

4 credits

Introduces intermediate glass blowing techniques using progressively more complex forms. Emphasis on design and working from prepared drawings. Prerequisite: CRF 130. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**CRF 230**

**Glass Blowing III**

4 credits

Introduces advanced techniques of producing blown glass pieces with multiple blown forms. Explores advanced design problems and the development of individual styles. Prerequisite: CRF 131. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**Computer Science**

**CSC 110**

**Introduction to Computing**

3 credits

Introduces problem solving through computer applications and a programming language. Examines development of computers, social and ethical implications of computers, and properties of programming languages. Covers input, storage, data manipulation, software and hardware. Lecture 3 hours per week.

**CSC 201**

**Computer Science I**

4 credits

Introduces algorithm and problem solving methods. Emphasizes structured programming concepts, elementary data structures and the study and use of a high level programming language. Prerequisites: CSC 110 or equivalent and MTH 173 or equivalent or divisional approval. Lecture 4 hours per week.

**CSC 205**

**Computer Organization**

3 credits

Examines the hierarchical structure of computer architecture. Focuses on multi-level machine organization used with a simple assembler language. Includes processors, instruction execution, addressing techniques, data representation and digital logic. Prerequisite: CSC 110. Lecture 3 hours per week.

**CSC 210**

**Programming with C++**

4 credits

Includes language syntax, problem solving techniques, top-down refinement, procedure definition, loop invariance, theory of numerical errors and debugging. Covers the syntax of the C++ language. Prerequisite: CSC 201, or EGR 125 or permission of the instructor. Lecture 4 hours per week.

**CSC 215**

**Advanced Computer Organization**

3 credits

Examines advanced topics in Computer Science such as I/O methods, virtual memory, disk management and operating systems. Introduces example of modern machine architecture. Prerequisite: CSC 205. Lecture 3 hours per week.

**Dance**

**DAN 160**

**Modern Dance**

2 credits

Teaches the basic techniques of creative dance. Skills include self-expression, contemporary routines, dance forms, and basic choreography. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week..

**DAN 161-162**

**Dance Production I-II**

2 credits each

Focuses on creating a dance performance. Teaches the basic skills in creating and producing a dance. Includes lighting, costumes, music, and choreography. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**DAN 163-164**

**Jazz I-II**

2 credits each

Introduces dance through contemporary jazz movements. Includes floor stretches, isolations, dance patterns and loco-motor movements. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week..

**DAN 165**

**Tap Dance**

2 credits

Teaches the basic footwork, patterns, and coinciding body movements to various rhythms. Includes development of choreographic routines. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week..

**DAN 166  
Ballet**

2 credits

Teaches ballet as a discipline with correct alignment and ballet form. Expresses movement through traditional dance form with choreographic emphasis. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**DAN 167  
Dance Improvisation**

2 credits

Explores the creation of spontaneous movement experiences with emphasis on self-expression and creature awareness. Includes improvisational techniques utilizing body awareness, use of the environment, and group dynamics. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**DAN 168  
Folk Dance**

2 credits

Introduces the basic step patterns, rhythmic patterns, position, and formations of traditional and ethnic group dances. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Dietetics****DIT 121  
Nutrition I**

3 credits

Studies food composition, dietary guidelines, and nutrients essential to healthy human life. Analyzes nutrient function and metabolism. Lecture 3 hours per week.

**DIT 125  
Current Concepts in Diet and Nutrition**

3 credits

Studies the importance of diet to health and well-being in daily life. Addresses current controversies over food practices and information, food facts and fiction, fad diets, vegetarianism, diet and heart disease, and sound guidelines for maintaining good health with wise food choices. Applies computer technology for nutritional

analysis. Intended especially for the non-dietetic major. Lecture 3 hours per week.

**DIT 130  
Food Management Systems**

3 credits

Studies the principles of food service delivery systems in institutional and other health care facilities. Includes fundamentals of menu planning, recipe standardization, food preparation, equipment, sanitation and safety, role of computers in food service, and concepts of food service management. Lecture 3 hours per week.

**Diagnostic Medical  
Sonography****DMS 206  
Introduction to Sonography**

2 credits

Introduces the diagnostic foundations of diagnostic medical sonography, including terminology, scan plane orientations, anatomical relationships, departmental administrative operations, hospital organization and basic patient care principles. Prerequisite: Admission to program. Lecture 2 hours per week.

**DMS 207  
Sectional Anatomy**

2 credits

Teaches normal sectional anatomy in the transverse, longitudinal and coronal planes, with correlated sonographic images. Emphasis will be placed on abdominopelvic organs and vasculature. Prerequisite: Admission to program. Lecture 2 hours per week.

**DMS 208  
Ultrasound Physics  
and Instrumentation I**

3 credits

Discusses and solves mathematical problems associated with human tissue, basic instrumentation and scanning technology. Prerequisite: Admission to program. Lecture 3 hours per week.

**DMS 209  
Ultrasound Physics  
and Instrumentation II**

3 credits

Focuses on the areas of ultrasonic, instrumentation, image artifacts, biologic effects, quality control, as well as Doppler principles and applications and basic types of equipment through lecture and laboratory exercises. Prerequisite: DMS 208. Lecture 3 hours per week.

**DMS 211  
Ultrasound Imaging I**

4 credits

Examines the clinical applications within the specialty of abdominal sonography including interpretation of normal and abnormal sonographic patterns, pathology, related clinical signs and symptoms, normal variants and clinical laboratory tests. Includes laboratory sessions on basic scanning techniques and protocols. Prerequisite: Admission to program. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**DMS 212  
Ultrasound Imaging II**

4 credits

Presents the clinical applications within the sonographic specialties of obstetrics and gynecology. Includes topics of discussion on normal and abnormal sonographic patterns, related clinical symptoms and associated laboratory tests. Includes laboratory sessions on basic scanning techniques. Prerequisite: DMS 211. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**DMS 221  
Ultrasound Seminar I**

3 credits

Introduces the fundamentals of renal failure and transplantations, small parts sonography, basic echocardiography, neonatal neurosonography, and rare and interesting ultrasonic case presentations. Prerequisite: Instructor permission. Lecture 3 hours per week.

**DMS 222  
Ultrasound Seminar II****3 credits**

Reviews material covered throughout the sonography program to prepare the student for the ultrasound registry examination.

Prerequisite: Instructor permission. Lecture 3 hours per week.

**DMS 223  
Introduction to Vascular Ultrasound****3 credits**

Discusses the principles of vascular ultrasound, the related anatomy and more common pathologies detected as well as the physiology and hemodynamics detected and evaluated with ultrasound. Prerequisite: Admission to program. Lecture 3 hours per week.

**DMS 231  
Clinical Education I****2 credits**

Develops the student's ultrasonic skills in a diagnostic environment; may include on-campus laboratories, private office settings, as well as hospital rotations.

Includes experience in abdominal, pelvic and obstetrical and small parts scanning.

Prerequisite: Admission to program.

Laboratory 10 hours per week.

**DMS 232  
Clinical Education II****4 credits**

Develops the student's ultrasonic skills in a diagnostic environment; may include on-campus laboratories, private office settings, as well as hospital rotations.

Includes experience in abdominal, pelvic and obstetrical and small parts scanning.

Prerequisite: DMS 231. Laboratory 20 hours per week.

**DMS 233  
Clinical Education III****5 credits**

Develops the student's ultrasonic skills in a diagnostic environment; may include on-campus laboratories, private office settings, as well as hospital rotations.

Includes experience in abdominal, pelvic and obstetrical and small parts scanning.

Prerequisite: DMS 232. Laboratory 25 hours per week.

**DMS 234  
Clinical Education IV****6 credits**

Develops the student's ultrasonic skills in a diagnostic environment; may include on-campus laboratories, private office settings, as well as hospital rotations.

Includes experience in abdominal, pelvic and obstetrical and small parts scanning.

Prerequisite: DMS 233. Laboratory 30 hours per week.

**Drafting****DRF 111-112  
Technical Drafting I-II****3 credits each**

Introduces technical drafting from the fundamentals through advanced drafting practices. Teaches lettering, metric construction, technical sketching, orthographic projection, sections, intersections, development, fasteners, theory and applications of dimensioning and tolerances. Includes pictorial drawing, and preparation of working and detailed drawings. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**DRF 151-152  
Engineering Drawing Fundamentals I-II****3 credits each**

Introduces technical drafting from the fundamentals through advanced drafting practices. Includes lettering, geometric construction, technical sketching, orthographic projection, sections, intersections, development, fasteners.

Teaches theory and application of dimensioning and tolerances, pictorial drawing, and preparation of drawings.

Lecture 1 hour. Laboratory 6 hours. Total 7 hours per week.

**DRF 160  
Machine Blueprint Reading****3 credits**

Introduces interpretation of various blueprints and working drawings. Applies basic principles and techniques such as visualization of an object, orthographic projection, technical sketching and drafting terminology. Requires outside preparation.

Lecture 3 hours per week.

**DRF 161  
Blueprint Reading I****2 credits**

Teaches the application of basic principles, visualization, orthographic projection, details of drafting shop processes and terminology, assembly drawings and exploded views. Considers dimensioning, changes and corrections, classes of fits, tolerances and allowances, sections and convention in blueprint reading. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**DRF 162  
Blueprint Reading II****2 credits**

Emphasizes industrial prints, auxiliary views, pictorial drawings, simplified drafting procedures, production drawing, operation sheets, tool drawing, assembly drawings, and detailed prints. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**DRF 165  
Architectural Blueprint Reading****3 credits**

Emphasizes reading, understanding and interpreting standard types of architectural drawings including plans, elevation, sections, and details. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**DRF 201****Computer-Aided Drafting and Design I**  
4 credits

Teaches computer-aided drafting concepts and equipment designed to develop a general understanding of components of a typical CAD system and its operation. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**DRF 202****Computer-Aided Drafting and Design II**  
4 credits

Teaches production drawings and advanced operations in computer aided drafting. Prerequisite: DRF 201. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**DRF 211****Advanced Technical Drafting I**  
3 credits

Teaches use of drafting equipment, with possible CAD applications, emphasizing knowledge and skill required for industrial drawing. Includes piping, gearing, geometric and positional tolerances, drawing layout and lettering of all types. Prerequisites: DRF 201 and DRF 202. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**DRF 212****Advanced Technical Drafting II**  
3 credits

Teaches concepts of sheet metal fabrication including radii, fillets and tolerances, electrical and electronics symbols and drawing, and advanced design drafting techniques. Prerequisites: DRF 201 and DRF 202. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**DRF 238-239****Computer-Aided Modeling and Rendering I-II**  
3 credits each

Focuses on training students in contemporary techniques of three-dimensional modeling, rendering, and animation on the personal computer. Introduces the principles of visualization, sometimes known as photo-realism, which enables the student to create presentation drawings for both architectural and

industrial product design. Uses computer animation to produce walk-throughs that will bring the third dimension to architectural designs. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**DRF 241-242****Parametric Solid Modeling I-II**  
3 credits each

Focuses on teaching students the design of parts by parametric solid modeling. Topics covered will include, but not limited to, sketch profiles; geometric and dimensional constraints; 3-D features; model generation by extrusion, revolution and sweep; and the creation of 2-D drawing views that include sections, details and auxiliary. Lecture 3 hours per week.

**DRF 247****Ship Design Drafting**  
3 credits

Introduces the shipbuilding industry, shop structure design components, and ship drafting to develop skills required in drawing the "lines" of a ship. Prerequisite: DRF 201. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**DRF 280****Design Capstone Project**  
3 credits

Focuses on design projects developed independently and in consultation with the instructor. Topics covered, but not limited to: parametric modeling, civil, mechanical piping, architectural applications, structural, electro-mechanical, 3-D solids, exploration of application software, and the integration of CAD/CAM. Prerequisites: (ARC 122 and ARC 221) or (DRF 201 and DRF 211). Lecture 3 hours per week.

**Diesel****DSL 121****Diesel Engines I**  
6 credits

Studies the basic principles involved in the construction and operation of diesel engines. Examines fuel, air, cooling, and control systems of various designs. Includes an elementary study of performance characteristics of diesel engines and fuel systems. Lecture 3 hours. Laboratory 6 hours. Total 9 hours per week.

**DSL 122****Diesel Engines II**  
5 credits

Continues DSL 121 with emphasis on engine overhaul and repair, including such jobs as grinding valves, gauging cylinder wear, removing and replacing cylinder liners, boring cylinders, replacing and adjusting bearings, gauging proper measuring instruments and tools for these tasks. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

**DSL 133****Diesel Fuel and Injection Systems**  
6 credits

Studies the design, operation, care, and repair of fuel injection systems used on a variety of diesel engines. Includes testing and reconditioning fuel injectors, nozzles, fuel pumps, and transfer pumps. Teaches use of calibrating and reconditioning equipment. Emphasizes care and cleanliness in troubleshooting the fuel system. Lecture 3 hours. Laboratory 6 hours. Total 9 hours per week.

**DSL 143****Diesel Truck Electrical Systems**  
4 credits

Studies the theory and operation of various truck and tractor electrical systems. Covers preheating, starting, generating, and lighting systems. Uses modern test equipment for measurement, adjustment, and troubleshooting. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**DSL 152  
Diesel Power Trains, Chassis,  
and Suspension**

4 credits

Studies the chassis, suspension, steering and brake systems found on medium and heavy-duty diesel trucks. Covers construction features, operating principles and service procedures for such power train components as clutches, multi-speed transmissions, propeller shafts, and rear axles. Teaches operations of modern equipment to correct and adjust abnormalities. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**DSL 161  
Air Brake Systems I**

2 credits

Studies the basic operational theory of pneumatic and air brake systems used in public transportation vehicles. Covers various air control valves, air and test system components, and advanced air system schematics. Lecture 2 hours per week.

**Economics**

**ECO 120  
Survey of Economics**

3 credits

Presents a broad overview of economic theory, history, development, and application. Introduces terms, definitions, policies, and philosophies of market economies. Provides some comparison with other economic systems. Includes some degree of exposure to microeconomic and macroeconomic concepts. Lecture 3 hours per week.

**ECO 201  
Principles of Macroeconomics**

3 credits

Introduces macroeconomics including the study of Keynesian, classical, and monetarist principles and theories, and the study of national economic growth, inflation, recession, unemployment, financial markets, money and banking, the role of government spending and taxation, along with

international trade and investments. Lecture 3 hours per week.

**ECO 202  
Principles of Microeconomics**

3 credits

Introduces the basic concepts of microeconomics. Explores the free market concepts with coverage of economic models and graphs, scarcity and choices, supply and demand, elasticity, marginal benefits and costs, profits, and production and distribution. Lecture 3 hours per week.

**Education**

**EDU 100  
Introduction to Education**

1 credit

Provides an overview of teaching as a career with orientation to theories, practices, responsibilities, guidelines, current trends and issues in education. Lecture 1 hour per week.

**EDU 160  
Observation and Assessment  
in Early Care**

3 credits

Introduces formal and informal methods of gathering data on children. Emphasis on understanding developmental patterns and implications for diagnostic teaching. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**EDU 200  
Introduction to Teaching as a Profession**

3 credits

Provides an orientation to the teaching profession in Virginia, including historical perspectives, current issues, and future trends in education on the national and state levels. Emphasizes information about teacher licensure examinations, steps to certification, teacher preparation and induction programs, and attention to critical shortage areas in Virginia. Includes supervised field placement (recommended: 40 clock hours) in a K-12 school. Prerequisite: Successful completion

of 24 credits of transfer courses. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**EDU 245  
Teaching and Training of  
Language Skills for Disabled**

3 credits

Covers the normal development of language, the identification of deficiencies in language development, and strategies for teaching language skills to individuals with a variety of developmental disabilities. Lecture 3 hours per week.

**EDU 247  
Adult Independent Living and Vocational  
Skills for Disabled**

4 credits

Emphasizes skills required to develop competencies in teaching developmentally disabled individuals ages 16 and older in vocational training settings. Develops competencies related to teaching independent living and mobility skills, occupational behavior skills, and job task performance skills. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**EDU 250  
Introduction to Developmental  
Disabilities**

4 credits

Presents an overview, history, and current philosophy of the developmental disabilities program. Provides descriptions and examines causes of developmental disabilities, identifies intervention strategies, promotes social and legal advocacy, explores employment and career opportunities. Laboratory experiences include a minimum of ten hours of observation of work settings. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**EDU 254****Teaching Basic Academic Skills to Exceptional Children**

3 credits

Develops competencies required to teach readiness and basic skills to children with special needs in private and public school settings. Includes the preparation of lesson plans, instructional units, and Individualized Education Programs (IEP's). Includes child abuse recognition and intervention training. Emphasizes exceptionalities for students ages 2 –21 under Public Law 94-142.

Familiarizes students with the indicators of effective teaching. Lecture 3 hours per week.

**EDU 255****Behavior Technology for Use with Developmental Disabilities**

4 credits

Presents basic principles of behavior modification and behavioral learning theory. Promotes skills in pinpointing, observing, and recording human behavior. Learning objectives include addressing attitude, knowledge, and mental and physical skill competencies needed for implementing behavioral programs. Lecture 3 hours.

Laboratory 2 hours. Total 5 hours per week.

## Engineering

**EGR 110****Engineering Graphics**

3 credits

Presents theories and principles of orthographic projection. Studies multi-view, pictorial drawings and sketches, geometric construction, sectioning, lettering, tolerancing, dimensioning and auxiliary projections. Studies the analysis and graphic presentation of space relationships of fundamental geometric elements; points, lines, planes and solids. Includes instruction in Computer Aided Drafting. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**EGR 120****Introduction to Engineering**

2 credits

Introduces the engineering profession, professional concepts, ethics, and responsibility. Reviews hand calculators, number systems, and unit conversions. Introduces the personal computer and operating systems. Includes engineering problem solving techniques using computer software. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**EGR 125****Introduction to Engineering Methods**

4 credits

Applies problem-solving techniques to engineering problems utilizing computer programming and algorithms in a higher level computer language such as FORTRAN, PASCAL, or C++. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**EGR 140****Engineering Mechanics - Statics**

3 credits

Introduces mechanics of vector forces and space, scalar mass and time, including S.I. and U.S. customary units. Teaches equilibrium, free-body diagrams, moments, couples, distributed forces, centroids, moments of inertia analysis of two-force and multi-force members and friction and internal forces. Lecture 3 hours per week.

**EGR 245****Engineering Mechanics - Dynamics**

3 credits

Presents approach to kinematics of particles in linear and curvilinear motion. Includes kinematics of rigid bodies in plane motion. Teaches Newton's second law, work-energy and power, impulse and momentum, and problem solving using computers. Lecture 3 hours per week.

**EGR 246****Mechanics of Materials**

3 credits

Teaches concepts of stress, strain, deformation, internal equilibrium, and basic properties of engineering materials. Analyzes axial loads, torsion, bending, shear and combined loading. Studies stress transformation and principle stresses, column analysis and energy principles. Lecture 3 hours per week.

**EGR 247****Mechanics of Materials Laboratory**

1 credit

Examines mechanical behavior of bars, rods, shafts, tubes and beams subjected to various types of loading. Introduces experimental stress analysis techniques, such as the use of strain gauges and data reduction. Laboratory 2 hours per week.

**EGR 260****Circuit Analysis**

3 credits

Covers topics in linear circuit analysis, including basic electrical properties, resistive circuits, network equations, operational amplifiers, network reduction techniques, network theorems, two-port parameters and networks, inductors, capacitors, first-order circuits, and second-order circuits and phasor analysis. Prerequisites may be applied locally. Lecture 3 hours per week.

**EGR 261****Signals and Systems**

3 credits

Covers topics including Laplace transforms and Laplace transform analysis of circuits, time and frequency domain representation of linear systems, methods of linear systems analysis including convolution and Laplace transforms, frequency domain representation of signals including frequency response, filters, Fourier series, and Fourier transforms. Prerequisites may be applied locally. Lecture 3 hours per week.

**EGR 262****Fundamental Circuits Laboratory**

2 credits

Covers topics including microprocessor hardware and programming, lab test equipment, lab safety, technical report writing, and using a microprocessor, such as the MicroStamp 11, to control basic electric circuits. Experiments include topics such as resistive circuits, analog-to-digital and digital-to-analog conversion, pulse width modulation, and the design of power supplies. Co-requisite: EGR 261. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**EGR 277****Digital Logic**

3 credits

Presents an introduction to digital logic, including such topics as number systems, Boolean algebra, minimization techniques, implementation of digital functions, sequential machines, state diagrams, state tables, and programmable logic devices. Lecture 3 hours per week.

**EGR 278****Digital Logic Laboratory**

2 credits

Constructs digital logic circuits to verify analysis and design methods. Covers logic gates, combinational and sequential logic circuits, programmable logic devices, measurement techniques, and report writing. Laboratory 4 hours per week.

**Electrical Technology****ELE 127****Residential Wiring Methods**

3 credits

Studies wiring methods and standards used for residential dwellings. Provides practical experience in design, layout, construction, and testing of residential wiring systems by use of scaled mock-ups. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**ELE 131-132****National Electrical Code I-II**

4 credits each

Provides comprehensive study of the purpose and interpretations of the National Electrical Code as well as familiarization and implementation of various charts, code rulings and wiring methods including state and local regulations. Lecture 4 hours per week.

**ELE 145****Transformer Connections and Circuits**

2 credits

Studies transformer theory, symbols, diagrams, connections, terminology and troubleshooting techniques. Prerequisite: ELE 150 or equivalent. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**ELE 146****Electric Motor Control**

4 credits

Studies solid state devices with application and emphasis toward control of power. Includes diodes, SCR's, photoelectric controls, timing, circuits, voltage regulation and three phase rectifiers. Prerequisite: ELE 150 or equivalent. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**ELE 149****Wiring Methods in Industry**

3 credits

Studies the fundamentals of industrial power distribution, circuits, switches, enclosures, panels, fuses, circuit breakers, transformers, and wiring methods using various charts and tables of the National Electrical Code. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**ELE 150****A.C. and D.C. Circuit Fundamentals**

3 credits

Provides an intensive study of the fundamentals of direct and alternating current, resistance, magnetism, inductance and capacitance, with emphasis on practical applications. Focuses on electrical/machine applications. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**ELE 160****Power Controls**

3 credits

Introduces basic electrical and other controls used in home and industry. Includes application of panels, fuse boxes, breakers, and transformers, experiments to develop testing and troubleshooting techniques. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**ELE 233-234****Programmable Logic Controller Systems I-II**

3 credits each

Teaches operating and programming of programmable logic controllers. Covers analog and digital interfacing and communication schemes as they apply to system. Prerequisite: ELE 146 or divisional approval. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Emergency Medical Services****EMS 111****Emergency Medical Technician - Basic**

6 credits

Prepares student for certification as a Virginia and National Registry EMT-Basic. Includes all aspects of pre-hospital basic life support as defined by the Virginia Office of Emergency Medical Services curriculum for Emergency Medicine Technician Basic. Prerequisite: CPR certification at the Health Care Provider level. Co-requisite: EMS 120. Lecture 4 hours. Laboratory 4 hours. Total 8 hours per week.

**EMS 120****Emergency Medical Technician – Basic Clinical**

1 credit

Observes in a program approved clinical/field setting. Includes topics for both EMS 111 and EMS 113, dependant upon the program in which the student is participating and is a co-requisite to both EMS 111 and EMS 113. Lecture 1 hour per week.

**EMS 151****Introduction to Advanced Life Support****4 credits**

Prepares the student for Virginia Enhanced certification eligibility and begins the sequence for National Registry Intermediate and/or Paramedic certification. Includes the theory and application of the following: foundations, human systems, pharmacology, overview of shock, venous access, airway management, patient assessment, respiratory emergencies, allergic reaction, and assessment based management. Conforms at a minimum to the Virginia Office of Emergency Medical Services curriculum. Co-requisite: EMS 170. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**EMS 153****Basic ECG Recognition****2 credits**

Focuses on the interpretation of basic electrocardiograms (ECG) and their significance. Includes an overview of anatomy and physiology of the cardiovascular system including structure, function and electrical conduction in the heart. Covers advanced concepts that build on the knowledge and skills of basic dysrhythmia determination and introduction to 12 lead ECG. Lecture 2 hours per week.

**EMS 155****ALS - Medical Care****4 credits**

Continues the Virginia Office of Emergency Medical Services Intermediate and/or Paramedic curricula. Includes ALS pharmacology, drug and fluid administration with emphasis on patient assessment, differential diagnosis and management of multiple medical complaints. Includes, but is not limited to conditions relating to cardiac, diabetic, neurological, non-traumatic abdominal pain, environmental, behavioral, gynecology, and toxicological disease conditions. Prerequisites: Current EMT-B certification, EMS 151 and EMS 153. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**EMS 157****ALS - Trauma Care****3 credits**

Continues the Virginia Office of Emergency Medical Services Intermediate and/or Paramedic curricula. Utilizes techniques which will allow the student to utilize the assessment findings to formulate a field impression and implement the treatment plan for the trauma patient. Prerequisites: Current EMT-B certification and EMS 151. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**EMS 159****ALS - Special Populations****2 credits**

Continues the Virginia office of Emergency Medical Services Intermediate and/or Paramedic curricula. Focuses on the assessment and management of specialty patients including obstetrical, neonates, pediatric, and geriatrics. Prerequisites: EMS 151 and EMS 153. Pre or co-requisite: EMS 155. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**EMS 170****ALS Internship I****1 credit**

Begins the first in a series of clinical experiences providing supervised direct patient contact in appropriate patient care facilities in and out of hospitals. Includes, but not limited to, patient care units such as the Emergency Department, Critical Care units, Pediatric, Labor and Delivery, Operating Room, Trauma centers and various advanced life support units. Laboratory 3 hours per week.

**EMS 172****ALS Clinical Internship II****1 credit**

Continues with the second in a series of clinical experiences providing supervised direct patient contact in appropriate patient care facilities in and out of hospitals. Includes, but not limited to, patient care units such as the Emergency Department, Critical Care units, Pediatric, Labor and Delivery, Operating Room and Trauma

Centers. Co-requisite: EMS 151. Laboratory 3 hours per week.

**EMS 173****ALS Field Internship II****1 credit**

Continues with the second in a series of field experiences providing supervised direct patient care in out-of-hospital advanced life support units. Laboratory 3 hours per week.

**EMS 201****EMS Professional Development****2 credits**

Prepares students for Paramedic certification at the National Registry Level by fulfilling community activism, personal wellness, resource management, ethical considerations in leadership and research objectives in the Virginia Office of Emergency Medical Services Paramedic curriculum. Lecture 2 hours per week.

**EMS 205****Advanced Pathophysiology****3 credits**

Focuses on the pathological processes of disease with emphasis on the anatomical and physiological alterations of the human body by systems. Includes diagnosis and management appropriate to the advanced health care provider in and out of the hospital environment. Lecture 3 hours per week.

**EMS 207****Advanced Patient Assessment****3 credits**

Focuses on the principles of normal and abnormal physical exam. Emphasizes the analysis and interpretation of physiological data to assist in patient assessment and management. Applies principles during the assessment and management of trauma, medical, and specialty patients in laboratory environment. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**EMS 209**  
**Advanced Pharmacology**

4 credits

Focuses on the principles of pharmacokinetics, pharmacodynamics and drug administration. Includes drug legislation, techniques of medication administration, and principles of math calculations. Emphasizes drugs used to manage respiratory, cardiac, neurological, gastrointestinal, fluid and electrolyte and endocrine disorders and includes classification, mechanism of action, indications, contraindications, precautions, and patient education. Incorporates principles related to substance abuse and hazardous materials. Applies principles during the assessment and management of trauma, medical, and specialty patients in a laboratory environment. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**EMS 211**  
**Operations**

2 credits

Prepares the student in the theory and application of the following: medical incident command, rescue awareness and operations, hazardous materials incidents, and crime scene awareness. (Conforms to the current Virginia Office of Emergency Medical Services curriculum for EMT-Paramedics.) Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**EMS 242**  
**ALS Clinical Internship III**

1 credit

Continues with the third in a series of clinical experiences providing supervised direct patient contact in appropriate patient care facilities in-and-out of hospitals. Includes, but not limited to patient care units such as the Emergency Department, Critical Care units, Pediatric, Labor and Delivery, Operating Room, Trauma Centers and various advanced life support units. Laboratory 3 hours per week.

**EMS 243**  
**ALS Field Internship III**

1 credit

Continues with the third in a series of field experiences providing supervised direct patient care in out-of-hospital advanced life support units. Laboratory 3 hours per week.

**EMS 244**  
**ALS Clinical Internship IV**

1 credit

The fourth in a series of clinical experiences providing supervised direct patient contact in appropriate patient care facilities in-and-out of hospitals. Includes, but not limited to patient care units such as the Emergency Department, Critical Care units, Pediatric, Labor and Delivery, Operating Room and Trauma Centers. May be repeated as necessary. Laboratory 3 hours per week.

**EMS 245**  
**ALS Field Internship IV**

1 credit

Continues with the fourth in a series of field experiences providing supervised direct patient care in out-of-hospital advanced life support units. May be repeated as necessary. Laboratory 3 hours per week.

**EMS 255**  
**Concepts in Critical Care**

5 credits

Prepares the paramedic or RN to become a critical care specialist, capable of managing the care of a critical care patient both in a hospital setting or during a high risk inter-facility transfer. Includes advanced concepts that build on the knowledge and skills of the paramedic and/or nursing curricula, as well as topics need to trouble shoot complex monitoring devices and equipment. Includes anatomy and physiology based clinical assessment, advanced airway management to include mechanical ventilators, diagnostics data interpretation, bedside hemodynamic monitoring, 12 lead EKG interpretation and hemodialysis care. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

**EMS 256**  
**12 Lead ECG Interpretation**

2 credits

Prepares student to interpret 12 lead electrocardiograms and recognize acute myocardial injury as well as infarct imitators. Includes lead placement, collection of the 12 lead ECG, review of cardiac anatomy and physiology, electrical conduction through the heart, common dysrhythmias, pathophysiology of AMI and infarct imitators. Includes field treatment of the acute coronary syndrome. Lecture 2 hours per week.

**English**

**ENG 1**  
**Preparing for College Writing I**

4 credits

Helps students discover and develop writing processes needed to bring their proficiency to the level necessary for entrance into their respective curricula. Guides students through the process of starting, composing, revising, and editing. Prerequisite: Placement Test. Lecture 4 hours per week.

**ENG 3**  
**Preparing for College Writing II**

4 credits

Emphasizes strategies within the writing process to help students with specific writing situations. Develops techniques to improve clarity of writing and raise proficiency to the level necessary for entrance into particular curricula. Prerequisite: Placement Test or ENG 1. Lecture 4 hours per week.

**ENG 4**  
**Reading Improvement I**

4 credits

Helps students improve their reading processes to increase their understanding of reading materials. Includes word forms and meanings, comprehension techniques, and ways to control reading pace. Prerequisite: Placement Test. Lecture 4 hours per week.

**ENG 5  
Reading Improvement II****4 credits**

Helps students read critically and increase appreciation of reading. Guides students in making inferences, drawing conclusions, detecting relationships between generalizations and supporting details. Includes interpreting graphic aids and basic library skills. Prerequisite: Placement Test or ENG 4. Lecture 4 hours per week.

**ENG 8  
Writing and Reading Improvement II****6 credits**

Emphasizes strategies within the writing and critical reading processes to help students with specific writing and reading assignments. Encourages an appreciation for clear writing and practical reading applications. Lecture 6 hours per week.

**ENG 108  
Critical Reading and Study Skills****3 credits**

Helps students improve their reading and learning processes. Includes advanced comprehension strategies and study skills such as time management, note-taking, studying from textbooks and other reading materials, taking examinations, and using the library. Lecture 3 hours per week.

**ENG 111  
College Composition I****3 credits**

Introduces students to critical thinking and the fundamentals of academic writing. Through the writing process, students refine topics; develop and support ideas; investigate, evaluate, and incorporate appropriate resources; edit for effective style and usage; and determine appropriate approaches for a variety of contexts, audiences, and purposes. Writing activities will include exposition and argumentation with at least one researched essay. Prerequisite: Placement Test. Lecture 3 hours per week.

**ENG 112  
College Composition II****3 credits**

Continues to develop college writing with increased emphasis on critical essays, argumentation, and research, developing these competencies through the examination of a range of texts about the human experience. Requires students to locate, evaluate, integrate, and document sources and effectively edit for style and usage. Prerequisite: ENG 111 or equivalent and ability to use word processing software. Lecture 3 hours per week.

**ENG 115  
Technical Writing****3 credits**

Develops ability in technical writing through extensive practice in composing technical reports and other documents. Guides students in achieving voice, tone, style, and content in formatting, editing, and graphics. Introduces students to technical discourse through selected reading. Lecture 3 hours per week.

**ENG 121-122  
Introduction to Journalism I-II****3 credits each**

Introduces students to all news media, especially news gathering and preparation for print. Prerequisite: ENG 111 or 112 or divisional approval. Lecture 3 hours per week.

**ENG 131  
Technical Report Writing I****3 credits**

Offers a review of organizational skills including paragraph writing and basic forms of technical communications, various forms of business correspondence, and basic procedures for research writing. Includes instruction and practice in oral communication skills. Prerequisite: ENG 111. Lecture 3 hours per week.

**ENG 139  
College Grammar****3 credits**

Studies formal English grammar and effective expression with attention to recognizing and employing appropriately the various levels of English usage, thinking logically, speaking and writing effectively, editing, evaluating content and intent of both spoken and written English, and punctuating correctly. Lecture 3 hours per week.

**ENG 210  
Advanced Composition****3 credits**

Helps students refine skills in writing non-fiction prose. Guides development of individual voice and style. Introduces procedures for publication. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**ENG 211-212  
Creative Writing I-II****3 credits each**

Introduces the student to the fundamentals of writing imaginatively. Students write in forms to be selected from poetry, fiction, drama, and essays. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**ENG 241-242  
Survey of American Literature I-II****3 credits each**

Examines American literary works from colonial times to the present, emphasizing the ideas and characteristics of our national literature. Involves critical reading and writing. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**ENG 243-244  
Survey of English Literature I-II****3 credits each**

Studies major English works from the Anglo-Saxon period to the present, emphasizing ideas and characteristics of the British literary tradition. Involves critical reading and writing. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**ENG 246**  
**Major American Writers**

3 credits

Examines major writers of American literary history. Involves critical reading and writing. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**ENG 251-252**  
**Survey of World Literature I-II**

3 credits

Examines major works of world literature. Involves critical reading and writing. Prerequisite ENG 112 or divisional approval. Lecture 3 hours per week.

**ENG 253-254**  
**Survey of African-American Literature I-II**  
3 credits each

Examines selected works by Black American writers from the colonial period to the present. Involves critical reading and writing. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**ENG 255**  
**Major Writers in World Literature**  
3 credits

Examines major writers selected from a variety of literary traditions. Involves critical reading and writing. Prerequisite ENG 112 or divisional approval. Lecture 3 hours per week.

**ENG 261-262**  
**Advanced Creative Writing I-II**  
3 credits each

Guides the student in imaginative writing in selected genres on an advanced level. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**ENG 276**  
**Southern Literature**  
3 credits

Examines the themes and techniques of selected writers dealing with the American South as a distinctive cultural entity. Involves critical reading and writing. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**ENG 279**  
**Film and Literature**

3 credits

Examines the translation of literature into film viewing and writing. Prerequisite ENG 112 or divisional approval. Lecture 3 hours per week.

**English As A Second Language**

**ESL 2**  
**English as a Second Language II**

12 credits

Provides intensive instruction and practice at the low intermediate level. Provides an introduction to the sound system, stress, and national and rhythmic patterns of English through listening and speaking exercises. Includes individualized instruction to improve basic reading comprehension. Requires practice in writing with emphasis on building basic sentence structures, grammar and sentence-level writing. Prerequisite: ESL Placement Test. Lecture 12 hours per week.

**ESL 5**  
**English as a Second Language: Reading I**

4 credits

Helps students to acquire and improve English reading and vocabulary skills. Includes practice in these skill areas: vocabulary building, prefixes and suffixes, predicting, reading by phrases, using context clues, skimming, scanning, reading maps. Also includes library orientation, reading literature, reading the newspaper. Prerequisite: ESL 2 or ESL Placement Test. Lecture 4 hours per week.

**ESL 6**  
**English as a Second Language: Reading II**

4 credits

Helps students improve their reading processes for academic and business reading by building skills such as finding and remembering facts, making inferences, drawing conclusions, getting meaning from context, increasing vocabulary, increasing reading speed; also includes library work, reading novels, and newspaper reading. Prerequisite: ESL 5 or ESL Placement Test. Lecture 4 hours per week.

**ESL 7**  
**Oral Communication I**

4 credits

Provides opportunities for students to acquire or improve listening skills and fluency in speaking English. Includes assessment of students' oral skills, provides exercises and practice in pronunciation, rhythm, stress, intonation, linking, pausing, and reductions. Prerequisite: ESL 2 or ESL Placement Test. Lecture 4 hours per week.

**ESL 8**  
**Oral Communication II**

4 credits

Helps students develop or improve speaking and listening skills for academic, business, and social settings. Includes review of pronunciations, rhythm, and intonation. Emphasizes clear communication in large or small groups through formal and informal presentations. Prerequisite: ESL 8 or ESL Placement Test. Lecture 4 hours per week.

**ESL 9**  
**Accent Reduction**

3 credits

Provides contextualized practice at the high intermediate/ advanced level to improve the speech intelligibility of non-native speakers of English. Focuses on problems of American English sound/spelling patterns, word endings, syllables, stress, rhythm and intonation common to speakers of different language backgrounds. May include individualized practice in consonant and vowel production. Lecture 3 hours per week.

**ESL 11****English as a Second Language:  
Composition I**  
4 credits

Provides instruction and practice in the writing process, emphasizing development of fluency in sentence level and paragraph writing and competence in structural and grammatical patterns of written English. Prerequisite: ESL 2 or ESL Placement Test. Lecture 4 hours per week.

**ESL 12****English as a Second Language:  
Composition II**  
4 credits

Provides further instruction and practice in the writing process, emphasizing short and longer paragraphs and introducing advanced language patterns. Includes word processing orientation, writing business letters, and extensive practice in developing and improving writing strategies. Prerequisite: ESL 11 or ESL Placement Test. Lecture 4 hours per week.

**ESL 13****English as a Second Language:  
Composition III**  
4 credits

Prepares for college-level writing by practice in the writing process, emphasizing development of thought in essays of greater length and complexity, and use of appropriate syntax and diction. Prerequisite: ESL 12 or ESL Placement Test. Lecture 4 hours per week.

**ESL 17****English as a Second Language:  
Reading III**  
4 credits

Helps students improve their reading comprehension and vocabulary development. Improves students' reading proficiency to a level which would allow students to succeed in certificate and degree programs. Emphasizes applying and synthesizing ideas. Includes ways to detect organization, summarize, make inferences, draw conclusions, evaluate generalizations, recognize differences between facts and opinions, and other advanced

comprehension strategies. May also include comprehensive library skills. Prerequisite: ESL 6 or ESL Placement Test. Lecture 4 hours per week.

**Electronics Technology****ETR 104****Electronic Fundamentals with  
Computer Applications**  
4 credits

Provides an introduction to the fundamentals of DC and AC circuit analysis and computer applications. Includes the study of electrical units and components, series, parallels, series-parallels, DC and AC circuits, inductive and capacitive reactance, impedance and use of circuit analysis software. Co-requisite: MTH 166. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**ETR 113-114****DC and AC Fundamentals I-II**  
4 credits each

Studies DC and AC circuits, basic electrical components, instruments, network theorems, and techniques used to predict, analyze and measure electrical quantities. Prerequisite: ETR 104 and MTH 166. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**ETR 115****DC and AC Circuits**  
3 credits

Studies current flow in direct and alternating current circuits with emphasis upon practical problems. Reviews mathematics used in circuit calculations. Introduces concepts of resistance, capacitance, inductance and magnetism. Focuses on electronics/circuits application. Lecture 3 hours per week.

**ETR 116****DC and AC Circuit Analysis**  
4 credits

Covers background information required by the Electronics Engineering Technology program but not covered in military electronic schools. Includes DC and AC

circuit analysis techniques such as Thevenin, Norton, Mesh, Nodal, branch current, three phase power, two port parameters, etc. Co-requisite: MTH 166. Lecture 4 hours per week.

**ETR 148****Amplifiers and Integrated Circuits**  
4 credits

Studies amplifiers, solid state and thermionic devices with emphasis on analysis and design of the time and frequency domain. Included also are linear and non-linear op-amps circuits. May include summing and integrating amplifiers, choppers, modulators and other new devices. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**ETR 166****Fundamentals of Computer Technology**  
3 credits

Introduces computer use and literacy. Includes operating systems, high level language programming, word processors, spreadsheets and other generic software. Uses engineering terms, standards and methods. Lecture 3 hours per week.

**ETR 168****Digital Circuit Fundamentals**  
3 credits

Covers the fundamentals of digital logic and the study of digital circuits and their applications. Lecture 3 hours per week.

**ETR 203****Electronic Devices I**  
3 credits

Studies active devices and circuits such as diodes, power supplies, transistors, amplifiers, and others. Prerequisite: Knowledge of D.C./A.C. theory. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**ETR 241****Electronic Communications I**  
4 credits

Studies noise, information and band-width, modulation and demodulation, transmitters and receivers, wave propagation, antennas and transmission lines. Include broad

band communication systems, microwave, both terrestrial and satellite, fiber optics, multiplexing and associated hardware. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**ETR 248**  
**Test Instruments and Measurements**  
2 credits

Studies circuits used in electronics measurement and application of these circuits to test instruments such as oscilloscopes, electronic meters, and bridges. Stresses the accuracy of measurements, how instruments work, proper use of instruments, and calibration techniques. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**ETR 250**  
**Solid State Circuits**  
4 credits

Teaches theory and application of amplifiers and oscillators. Includes amplifier circuit configurations, amplifier classes, operational amplifiers, power amplifiers, band-width distortion, and principles of feedback. Prerequisite: ETR 148. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**ETR 261**  
**Microprocessor Applications I**  
4 credits

Teaches the fundamentals of microprocessors, including architecture, internal operations, memory, I/O devices, machine level programming and interfacing. Emphasizes instrumentation and microprocessor. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**ETR 279**  
**Digital Principles, Terminology and Applications**  
4 credits

Studies digital principles, terminology and applications covering number systems, arithmetic, Boolean algebra, Karnaugh maps and advanced logic circuits. Includes the study of registers, encoding and decoding, and multiplexing; A/D, D/A displays and others. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**ETR 281**  
**Digital Systems**  
3 credits

Includes basic numbering systems, Boolean algebra, logic circuits and systems, pulse circuits and pulse logic systems as applied to computer and microprocessor technology. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

## Financial Services

**FIN 107**  
**Personal Finance**  
3 credits

Presents a framework of personal money management concepts, including establishing values and goals, determining sources of income, managing income, preparing a budget, developing consumer buying ability, using credit, understanding savings and insurance, providing for adequate retirement, and estate planning. Lecture 3 hours per week.

**FIN 110**  
**Principles of Banking**  
3 credits

Presents nearly every aspect of banking, providing a comprehensive introduction to the diversified services and operations of the banking industry. Focuses on new trends gaining attention in banking circles. Recommended for all banking students. (AIB Approved). Lecture 3 hours per week.

**FIN 115**  
**Personal Investments**  
2 credits

Examines personal financial investments, money management and risk reward strategies. Covers most widely employed investment instruments, including current information on stocks, bonds, mutuals, real estate, limited partnerships and tax sheltering devices. Lecture 2 hours per week.

**FIN 215**  
**Financial Management**  
3 credits

Introduces basic financial management topics including statement analysis, working capital, capital budgeting, and long-term financing. Focuses on net present value and internal rate of return techniques, lease vs. buy analysis, and cost of capital computations. Uses problems and cases to enhance skills in financial planning and decision making. Prerequisite: ACC 212. Lecture 3 hours per week.

**FIN 260**  
**Financial Management for Small Business**  
2 credits

Provides the tools of financial planning for the small business owner. Includes areas such as financial statements, ratio analysis, forecasting profit, cash flow, pricing, and obtaining capital. Prerequisite: ACC 220 (or ACC 211) and BUS 165. Lecture 2 hours per week.

## Funeral Services

**FNS 110**  
**Introduction to Funeral Service**  
2 credits

Presents a comprehensive study of the history of funeral service, commencing with the practices of the Egyptians, early Christians, Romans, and Hebrews. Traces funeral practice from its early pagan origins to the modern practices of today. Prerequisite: Instructor permission. Lecture 2 hours per week.

**FNS 111**  
**Theory of Embalming I**  
3 credits

Introduces the purpose and historical background of embalming. Teaches the ethics and sanitary consideration in the handling of human remains, signs and tests of deaths, and postmortem changes in the body. Prerequisite: Instructor permission. Co-requisite: FNS 113. Lecture 3 hours per week.

**FNS 112****Theory of Embalming II**

3 credits

Presents pre-embalming diagnosis, positioning the body and posing the features, linear and anatomical guides for selected blood vessels, and factors that influence fluid distribution and blood drainage. Prerequisites: FNS 111 and FNS 113. Co-requisite: FNS 114. Lecture 3 hours per week.

**FNS 113****Theory of Embalming Laboratory I**

1 credit

Teaches the basic procedures of embalming. Presents instruments, equipment, and the types of preservatives and disinfectant chemicals used in embalming. Prerequisite: Instructor Permission. Co-requisite: FNS 111. Laboratory 3 hours per week.

**FNS 114****Theory of Embalming Laboratory II**

1 credit

Teaches through practice and demonstration of various embalming techniques. May include clinical experiences in area funeral homes. Prerequisites: FNS 111 and FNS 113. Co-requisite: FNS 112. Laboratory 3 hours per week.

**FNS 121****Anatomy for Funeral Service I**

3 credits

Introduces anatomy and physiology and basic terminology. Presents information about wills, tissues, and organs. Discusses the reproductive, urinary, and endocrine body system. Lecture 3 hours per week.

**FNS 125****Microbiology for Funeral Service**

3 credits

Focuses on microscopic forms of life from a morphological, cultural, and staining viewpoint. Studies in detail causative agents of disease and their importance to a scientific approach to sanitation. Stresses the need for scientific knowledge concerning disease and its cause. Prerequisite: Admission to program. Lecture 3 hours per week.

**FNS 126****Pathology for Funeral Service**

3 credits

Introduces the general processes of disease, stressing their importance to the scientific embalmer and funeral director as health guardians. Studies diseases of specific organs and organ systems with emphasis on the significant structural changes involved and the embalming problems they present. Prerequisite: Instructor permission. Lecture 3 hours per week.

**FNS 211****Restorative Art I**

3 credits

Presents surface contour; the influence of the bone structure on facial form; and the effect of the facial muscles on the wrinkles, grooves, and folds of the face. Teaches the treatments and techniques for restorations. Introduces wax and non-wax treatments such as swellings, feature corrections, and hair restoration. Studies lip- waxing techniques and the modeling of various forms of the mouth and eyes. Teaches the rudiments of cosmetic knowledge and techniques through lectures, demonstrations, and student participation. Prerequisite: Instructor Permission. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**FNS 212****Restorative Art II**

3 credits

Studies color principles and their application to funeral work and the funeral establishment. Teaches the basic principles employed in recreating the personalized form and dimensions of each facial feature when restoration is necessary. Focused on problem cases which require illusory corrections, matching wax color skin, and the masking of small and extensive discolorations. Teaches feature construction with restorative wax through demonstrations and laboratory practice. Prerequisite: FNS 211. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**FNS 231****Principles of Funeral Management I**

4 credits

Introduces the basic social, religious, ethical, and psychological factors that influence funeral service. Teaches telephone techniques and etiquette and acceptable funeral terminology. Studies the various types of religious, fraternal, and military funeral services. Prerequisite: Instructor permission. Lecture 4 hours per week.

**FNS 232****Principles of Funeral Management II**

4 credits

Teaches merchandising, the principles of buying and selling and the techniques of making funeral arrangements. Studies the construction and proper selection of casket, room arrangement, and Social Security and veterans' benefits. Focuses on modern funeral establishment management techniques and procedures. Prerequisite: FNS 231. Lecture 4 hours per week.

**FNS 236****Funeral Service Law**

2 credits

Focuses on the duties, rights, responsibilities, and liabilities of the funeral director and embalmer. Teaches building and zoning ordinances relating to the funeral establishment, tort liability, cemetery law, wills, and the administration of estates. Introduces students to the basic principles of business law and ethical conduct as it pertains to the practice of funeral service. Prerequisite: Instructor permission. Lecture 2 hours per week.

**FNS 270****Funeral Service Review**

3 credits

Prepares the student for national and state licensing examination in funeral service. Reviews all materials that will be covered by funeral service licensing examinations. Teaches modern test-taking techniques. Requires the writing of a detailed outline of one funeral service subject which determines the final grade. This is a capstone course designed to prepare students for the National

Board Examination (NBE). Completion of the NBE is a requirement for successful completion of this course. FEE: \$350 for NBE Exam. Prerequisite: Instructor permission. Lecture 3 hours per week.

## French

### **FRE 101-102** **Beginning French I-II** 4 credits each

Introduces understanding, speaking, reading, and writing skills and emphasizes basic French sentence structure. Lecture 4 hours per week. May include one additional hour of oral practice per week.

### **FRE 203-204** **Intermediate French I-II** 3 credits each

Continues to develop understanding, speaking, reading, and writing skills. Prerequisite: FRE 102 or equivalent. Lecture 3 hours per week.

## Fire Science Technology

### **FST 100** **Principles of Emergency Services** 3 credits

Provides an overview to fire protection; career opportunities in fire protection and related fields; philosophy and history of fire protection/service; fire loss analysis; organization and function of public and private fire protection services; fire departments as part of local government; laws and regulations affecting the fire service; fire service nomenclature; specific fire protection functions; basic fire chemistry and physics; introduction to fire protection systems; introduction to fire strategy and tactics. Lecture 3 hours per week.

### **FST 110** **Fire Behavior and Combustion** 3 credits

Explores the theories and fundamentals of how and why fires start, spread, and how they are controlled. Lecture 3 hours per week.

### **FST 112** **Hazardous Materials Chemistry** 3 credits

Provides basic fire chemistry relating to the categories of hazardous materials including problems of recognition, reactivity, and health encountered by firefighters. Lecture 3 hours per week.

### **FST 115** **Fire Prevention** 3 credits

Provides fundamental information regarding the history and philosophy of fire prevention, organization and operation of a fire prevention bureau, use of fire codes, identification and correction of fire hazards, and the relationships of fire prevention with built-in fire protection systems, fire investigation, and fire and life-safety education. Lecture 3 hours per week.

### **FST 120** **Occupational Safety and Health for the Fire Service** 3 credits

Introduces the basic concepts of occupational health and safety as it relates to emergency service organizations. Includes risk evaluation and control procedures for fire stations, training sites, emergency vehicles, and emergency situations involving fire, EMS, hazardous materials, and technical rescue. Upon completion of this course, students should be able to establish and manage a safety program in an emergency service organization. Lecture 3 hours per week.

### **FST 205** **Fire Protection Hydraulics and Water Supply** 3 credits

Provides a foundation of theoretical knowledge in order to understand the principles of the use of water in fire protection and to apply hydraulic principles to analyze and to solve water supply problems. Lecture 3 hours per week.

### **FST 210** **Legal Aspects of Fire Service** 3 credits

Introduces the Federal, State, and local laws that regulate emergency services, national standards influencing emergency services, standard of care, tort, liability, and a review of relevant court cases. Lecture 3 hours per week.

### **FST 215** **Fire Protection Systems** 3 credits

Provides information relating to the features of design and operation of fire detection and alarm systems, heat and smoke control systems, special protection and sprinkler systems, water supply for fire protection and portable fire extinguishers. Lecture 3 hours per week.

### **FST 220** **Building Construction for Fire Protection** 3 credits

Provides the components of building construction that relate to fire and life safety. Focuses on firefighter safety. Covers the elements of construction and design of structures and how they are key factors when inspecting buildings, preplanning fire operations, and operating at emergencies. Lecture 3 hours per week.

**FST 230****Fire Investigation**

3 credits

Provides the student with the fundamentals and technical knowledge needed for proper fire scene interpretations, including recognizing and conducting origin and cause, preservation of evidence and documentation, scene security, motives of the firesetter, and types of fire causes. Lecture 3 hours per week.

**FST 235****Strategy and Tactics**

3 credits

Provides an in-depth analysis of the principles of fire control through utilization of personnel, equipment, and extinguishing agents on the fire ground. Lecture 3 hours per week.

**FST 237****Emergency Service Supervision**

3 credits

Teaches the history of modern management theories, including scientific management and behavioral scientist approach. Introduces concepts of group dynamics, leadership, communication, stress and time management, and personnel evaluation techniques. Discusses the legal and ethical considerations of personnel management in the emergency service. Lecture 3 hours per week.

**FST 240****Fire Administration**

3 credits

Introduces the student to the organization and management of a fire department and the relationship of government agencies to the fire service. Emphasizes fire service leadership from the perspective of the company officer. Lecture 3 hours per week.

**FST 245****Fire and Risk Analysis**

3 credits

Presents a study of current urban fire problems with emphasis on solutions based upon current available technology. Includes master planning, as well as methods of identifying, analyzing and measuring

accompanying risk and loss possibilities.

Prerequisite: FST 240. Lecture 3 hours per week.

## Geography

**GEO 200****Introduction to Physical Geography**

3 credits

Studies major elements of the natural environment including earth sun relationship, land forms, weather and climate, natural vegetation and soils. Introduces the student to types and uses of maps. Lecture 3 hours per week.

**GEO 210****People and the Land: Introduction to Cultural Geography**

3 credits

Focuses on the relationship between culture and geography. Presents a survey of modern demographics, landscape modification, material and non-material culture, language, race and ethnicity, religion, politics, and economic activities. Introduces the student to types and uses of maps. Lecture 3 hours per week.

**GEO 220****World Regional Geography**

3 credits

Studies physical and cultural characteristics of selected geographical regions of the world. Focuses upon significant problems within each of the regions, and examines the geographical background of those problems. Introduces the student to types and uses of maps. Lecture 3 hours per week.

**GEO 221 - 222****Regions of the World I-II**

3 credits each

Presents an overview of physical and cultural characteristics of selected geographical regions of the world. Focuses upon significant problems within each of the regions. Studies the European cultural sphere including Europe, Soviet Union, the Americas and Australia and the emerging

nations in Africa, Southwest Asia and the Orient. Introduces the student to types and uses of maps. Lecture 3 hours per week.

**GEO 230****Political Geography**

3 credits

Emphasizes the influence of geography on political systems and nation states. Discusses historic and current events including campaigns, wars, and treaties as functions of land, resources and energy requirements. Introduces the student to types and uses of maps. Lecture 3 hours per week.

## German

**GER 101-102****Beginning German I-II**

4 credits each

Introduces understanding, speaking, reading, and writing skills and emphasizes basic German sentence structure. Lecture 4 hours per week. May include one additional hour oral practice per week.

**GER 201-202****Intermediate German I-II**

3 credits each

Continues to develop understanding, speaking, reading, and writing skills. Classes conducted in German. Prerequisite: GER 102 or equivalent. Lecture 3 hours per week. May include one additional hour oral practice per week.

## Geographical Information Systems

**GIS 200****Geographical Information Systems I**

4 credits

Provides hands-on introduction to a dynamic desktop GIS (Geographic Information System). Introduces the components of a desktop GIS and their functionality. Emphasizes manipulation of data for the purpose of analysis,

presentation, and decision-making.  
Prerequisite: ITE 115 or instructor approval.  
Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

### **GIS 201** **Geographical Information Systems II** 4 credits

Provides a continuation of GIS 200, with emphasis on advanced topics in problem solving, decision-making, modeling, programming, and data management. Covers map projections and data formats, and methods for solving the problems they create. Prerequisite: GIS 200. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

## Geophysical Sciences

### **GOL 105** **Physical Geology** 4 credits

Introduces the composition and structure of the earth and modifying agents and processes. Investigates the formation of minerals and rocks, weathering, erosion, earthquakes, and crustal deformation. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

### **GOL 106** **Historical Geology** 4 credits

Traces the evolution of the earth and life through time. Presents scientific theories of the origin of the earth and life and interprets rock and fossil records. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

### **GOL 110** **Earth Science** 4 credits

FOR NON-SCIENCE MAJORS.  
Examines the dynamics of the earth and its relation to the solar system. Applies the principles of geology, oceanography, meteorology and astronomy in a multi-disciplinary science environment. Stresses the effects of geologic processes on the environment. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

### **GOL 111-112** **Oceanography I-II** 4 credits each

Examines the dynamics of the oceans and ocean basins. Applies the principles of physical, chemical, biological, and geological oceanography. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

### **GOL 135** **Field Studies in Geology** 2 credits

Investigates geologic phenomena. Includes activities such as observation of regional geology and landforms, collection of samples, and measurement and interpretation of geologic structures. Field studies 6 hours per week.

### **GOL 225** **Environmental Geology** 4 credits

Explores the interaction between man and his physical environment. Stresses geologic hazards and environmental pollution utilizing case histories. Prerequisite: GOL 105. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

## History

### **HIS 101-102** **History of Western Civilization I-II** 3 credits each

Examines the development of western civilization from ancient times to the present. HIS 101 ends with the seventeenth century; HIS 102 continues through modern times. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

### **HIS 111-112** **History of World Civilization I-II** 3 credits each

Surveys Asian, African, Latin American, and European civilizations from the ancient period to the present. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

### **HIS 121-122** **United States History I-II** 3 credits each

Surveys United States history from its beginning to the present. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

### **HIS 141-142** **African-American History I-II** 3 credits each

Surveys the history of black Americans from their African origins to the present. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

### **HIS 155** **Life in Colonial Virginia** 3 credits

Studies life in Virginia before the American Revolution, including politics, economics, customs, culture, and the slave plantation system. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

### **HIS 262** **United States History in Film** 3 credits

Examines selected topics in the United States history which shaped the American experience. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

### **HIS 265** **History of the Old South** 3 credits

Examines the unique society that existed in the southern United States between 1815 and 1860. Emphasizes political, economic, social, and cultural characteristics that developed in the South before the Civil War. Prerequisites: HIS 121-122. Lecture 3 hours per week.

### **HIS 266** **Military History of the Civil War** 3 credits

Analyzes military campaigns of the Civil War, including factors contributing to the defeat of the Confederacy and problems created by the war. May include field trips to Civil War sites in the region. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

**HIS 269****Civil War and Reconstruction**

3 credits

Studies factors that led to the division between the States. Examines the war, the home fronts, and the era of Reconstruction. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

**HIS 280****American Foreign Policy Since 1890**

3 credits

Examines American foreign policy since 1890 with an emphasis on current events and diverse points of view. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

**HIS 281-282****History of Virginia I-II**

3 credits each

Examines the cultural, political, and economic history of the Commonwealth from its beginning to the present. Prerequisite: Placement into ENG 111. Lecture 3 hours per week.

## Health Information Technology

**HIT 101****Health Information Technology I**

4 credits

Introduces values, uses and content of the medical record. Defines numbering, filing and retention policies and practices. Prerequisite: Admission into the Health Information Technology program. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**HIT 103****Health Information Technology II**

2 credits

Introduces principles of data quality and validation types and uses of health databases. Lecture 1 hour. Laboratory 3 hours. Prerequisite: Instructor permission. Total 4 hours per week.

**HIT 110****Introduction to Human Pathology**

3 credits

Introduces the basic concepts, terminology, etiology, and characteristics of pathological processes. Prerequisite: Instructor permission. Lecture 3 hours per week.

**HIT 143****Managing Electronic Billing in a Medical Practice**

2 credits

Presents practical knowledge on use of computer technology in medical practice management. Develops basic skills in preparation of universal billing claim. Explores insurance claim processing issues. Lecture 2 hours per week.

**HIT 151****Reimbursement Issues in Medical Practice Management**

2 credits

Introduces major reimbursement systems in the United States. Focuses on prospective payment systems, managed care, and documentation necessary for appropriate reimbursement. Emphasizes management of practice to avoid fraud. Lecture 2 hours per week.

**HIT 215****Health Data Classification Systems**

5 credits

Focuses on disease and procedure classification systems currently utilized for collecting health data for the purposes of statistical research and financial reporting. Prerequisite: Instructor permission. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

**HIT 220****Health Statistics**

2 credits

Introduces the students to basic statistical principles and calculations as applied in the health care environment, procedures for collection and reporting vital statistics, and quality control basics. Prerequisite: Instructor permission. Lecture 2 hours per week.

**HIT 226****Legal Aspects of Health Record Documentation**

2 credits

Presents the legal requirements associated with health record documentation. Emphasizes the policies and procedures concerning the protection of the confidentiality of the patient's health record. Lecture 2 hours per week.

**HIT 229****Performance Improvement in Health Care Settings**

2 credits

Focuses on concepts of facility-wide performance improvement, resource management, and risk management. Applies tools for data collection and analysis. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**HIT 230****Information Systems and Technology in Health Care**

3 credits

Explores computer technology and system application in health care. Introduces the information systems life cycle. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**HIT 249****Supervision and Management Practices**

3 credits

Introduces supervision and management principles with emphasis on application of these principles in the health information setting. Lecture 3 hours per week.

**HIT 253****Health Records Coding**

4 credits

Examines the development of coding classification systems. Introduces ICD-9-CM coding classification system, its format and conventions. Stresses basic coding steps and guidelines according to body systems. Provides actual coding exercises in relation to each system covered. Prerequisites: HLT 143 and 220 or equivalent. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**HIT 254****Advanced Coding and Reimbursement**  
4 credits

Stresses advanced coding skills through practical exercises using actual medical records. Introduces CPT-4 coding system and guidelines for out-patient/ambulatory surgery coding. Introduces prospective payment system and its integration with ICD-9-CM coding. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**HIT 260****Pharmacology for Health Information Technology**  
2 credits

Introduces the general study of drug classifications, uses, and effects as required to perform health data collection and retrieval tasks. Lecture 2 hours per week.

**Health****HLT 100****First Aid and Cardiopulmonary Resuscitation**  
3 credits

Focuses on the principles and techniques of safety, first aid, and cardiopulmonary resuscitation. Lecture 3 hours per week.

**HLT 105****Cardiopulmonary Resuscitation**  
1 credit

Provides training in coordinated mouth-to-mouth artificial ventilation and chest compression, choking, life-threatening emergencies, and sudden illness. Lecture 1 hour per week.

**HLT 106****First Aid and Safety**  
2 credits

Focuses on the principles and techniques of safety and first aid. Lecture 2 hours per week.

**HLT 110****Concepts of Personal and Community Health**  
3 credits

Studies the concepts related to the maintenance of health, safety, and the prevention of illness at the personal and community level. Lecture 3 hours per week.

**HLT 116****Introduction to Personal Wellness Concepts**  
3 credits

Introduces students to the dimensions of wellness including the physical, emotional, environmental, spiritual, occupational, and social components. Explores the relationship between personal health and physical fitness as they apply to individuals in today's society. Includes nutrition, weight control, stress, conditioning, and drugs. Lecture 3 hours per week.

**HLT 121****Introduction to Drug Use and Abuse**  
3 credits

Explores the use and abuse of drugs in contemporary society with emphasis upon sociological, physiological and psychological effects of drugs. Lecture 3 hours per week.

**HLT 122****Introduction to Alcohol Abuse and Control**  
1 credit

Explores the physiological, psychological, sociological effects of alcohol. Studies why people drink, disease concepts, alcohol tolerance curves, and alcohol's effect on the operation of a motor vehicle. Lecture 1 hour per week.

**HLT 130****Nutrition and Diet Therapy**  
1 credit

Studies nutrients, sources, functions, and requirements with an introduction to diet therapy. Lecture 1 hour per week.

**HLT 135****Child Health and Nutrition**  
3 credits

Focuses on the physical needs of the preschool child and the methods by which

these are met. Emphasizes health routines, hygiene, nutrition, feeding and clothing habits, childhood diseases, and safety as related to health, growth and development. Lecture 3 hours per week.

**HLT 138****Principles of Nutrition**  
2 credits

Studies nutrient components of food, including carbohydrates, fats, proteins, vitamins, minerals and water. Provides a behavioral approach to nutrient guidelines for the development and maintenance of optimum wellness. Lecture 2 hours per week.

**HLT 143-144****Medical Terminology I-II**  
3 credits each

Provides an understanding of medical abbreviations and terms. Includes the study of prefixes, suffixes, word stems, and technical terms with emphasis on proper spelling, pronunciation, and usage. Emphasizes more complex skills and techniques in understanding medical terminology. Lecture 3 hours per week.

**HLT 155****Current Issues in Health Care**  
2 credits

Focuses on current issues in the health care industry. Lecture 2 hours per week.

**HLT 156****Health Care for Athletic Injuries**  
3 credits

Teaches prevention and care of athletic injuries, recognition and management of head and spinal injuries, fractures, strains, sprains, as well as cardiac emergencies. Discusses taping, protective equipment, and medical referral. Lecture 3 hours per week.

**HLT 200****Human Sexuality**  
3 credits

Provides a basic understanding of human sexuality. Includes anatomy, physiology, pregnancy, family planning, venereal diseases, and sexual variations. Lecture 3 hours per week.

**HLT 204****Women's Health**

3 credits

Explores current issues related to women's health and wellness with an emphasis upon prevention of disease and optimum well being. Takes a multi-ethnic approach to exploring the most up-to-date findings, diagnostic tools, and treatments for breast cancer, reproductive tract illness, heart, and other common diseases faced by women from puberty through menopause. Lecture 3 hours per week.

**HLT 215****Personal Stress and Stress Management**

3 credits

Provides a basic understanding of stress and its physical, psychological, and social effects. Includes the relationships between stress and change, self-evaluation, sources of stress, and current coping skills for handling stress. Lecture 3 hours per week.

**HLT 226****AIDS Awareness**

2 credits

Provides basic understanding of Acquired Immune Deficiency Syndrome (AIDS), AIDS-Related Complex (ARC), and Human Immunodeficiency Virus (HIV) Infection. Includes information on the etiology of AIDS, historical perspectives, signs and symptoms, HIV antibody testing, safer sex guidelines, AIDS in the workplace (including health care settings), psychosocial issues, death and dying issues, homophobia, and HIV transmission and prevention. Lecture 2 hours per week.

**HLT 270****Health and Well-Being of the Older Adult**

3 credits

Focuses on the health of the older adult. Teaches health promotion, preventive health techniques and accident prevention. Prerequisite: Admission to the program. Lecture 3 hours per week.

**HLT 271****Physical Care Management of the Older Adult**

3 credits

Introduces physiology of aging. Integrates caretaker guidelines. Demonstrates skills to care for aging at a variety of functional levels. Prerequisite: Admission to the program. Lecture 3 hours per week.

**HLT 272****Medical Management of the Older Adult**

3 credits

Introduces common medical problems associated with the aging; Examines preventive and restorative care associated with common illnesses. Focuses on assessments, evaluation, and safe administration of medications. Includes emergency care and CPR. Prerequisite: Admission to the program. Lecture 3 hours per week.

**Human Services****HMS 100****Introduction to Human Services**

3 credits

Introduces human service agencies, roles and careers. Presents an historical perspective of the field as it relates to human services today. Additional topics include values clarification and needs of target populations. Lecture 3 hours per week.

**HMS 225****Functional Family Intervention**

3 credits

Provides an understanding of functions and dysfunctions within the family. Emphasizes the development of effective skills through an interpersonal/interactional approach to family intervention. Lecture 3 hours per week.

**HMS 231-232****Gerontology I-II**

3 credits each

Examines characteristics of the aging process and problems for the elderly. Considers both theoretical and applied perspectives on the following issues: biological, psychological, sociological, economic and political. Lecture 3 hours per week.

**HMS 233****Psycho and Socio Aspects of Older Adult Care**

3 credits

Provides psychological and sociological perspectives on aging. Examines changes in social roles and relationships, social aspects of individual aging, economics, and the politics of aging. Lecture 3 hours per week.

**HMS 238****Selected Topics in Aging**

3 credits

Provides students with an opportunity to explore a variety of major current issues in aging. Topics may include care giving and the elderly, elderly drug use and misuse, protective services, crisis interventions, homecare, elder-abuse, and other current topics. Lecture 3 hours per week.

**Hotel-Restaurant-Institutional Management****HRI 101-102****Hotel-Restaurant Organization and Management I-II**

3 credits each

Introduces the history, opportunities, problems and trends of the hospitality industry. Covers the organization of the various sectors of the hospitality industry including human resources, general business considerations, and management theory. Lecture 3 hours per week.

**HRI 106-107****Principles of Culinary Arts I-II****3 credits each**

Introduces the fundamental principles of food preparation and basic culinary procedures. Stresses the use of proper culinary procedures combined with food science, proper sanitation, standards of quality for food items that are made, and proper use and care of kitchen equipment. Lecture 3 hours per week.

**HRI 128****Principles of Baking****3 credits**

Instructs the student in the preparation of breads, pastries, baked desserts, candies, frozen confections, and sugar work. Applies scientific principles and techniques of baking. Promotes the knowledge/skills required to prepare baked items, pastries and confections. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**HRI 134****Food and Beverage Service Management****3 credits**

Provides a conceptual and technical framework for managing the service of meals in a variety of commercial settings. Studies the integration of production and service delivery, guest contact dynamics, reservations management and point-of-sale systems. Lecture 3 hours per week.

**HRI 145****Garde Manger****3 credits**

Studies garde manger, the art of decorative cold food preparation and presentation. Provides a detailed practical study of cold food preparation and artistic combination and display of cold foods. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**HRI 150****Introduction to Hospitality Ownership****3 credits**

Presents growth, development, present status and trends of the food and lodging industry. Includes special problems of operating small and medium sized establishments.

Introduces credit and accounting procedures, management of staff, marketing, advertising, and security, as well as personal attitudes, qualifications, and ethics. Lecture 3 hours per week.

**HRI 158****Sanitation and Safety****3 credits**

Covers the moral and legal responsibilities of management to insure a sanitary and safe environment in a food service operation. Emphasizes the causes and prevention of food borne illnesses in conformity with federal, state and local guidelines. Focuses on OSHA standards in assuring safe working conditions. Lecture 3 hours per week.

**HRI 160****Executive Housekeeping****3 credits**

Studies the housekeeping department with emphasis on organization, staffing and scheduling, staff development, work methods improvements, equipment, cleaning materials and cleaning procedures, maintenance and refurbishing, room design and safety engineering. Lecture 3 hours per week.

**HRI 180****Convention Management and Service****3 credits**

Examines the scope and different segments that make up the convention market, explains what is required to meet individual needs, and explores methods and techniques for better service. Lecture 3 hours per week.

**HRI 206****International Cuisine****3 credits**

Introduces the concepts of cultural differences and similarities and the preparation of the food specialties of the major geographical areas of the world. Focuses on emerging cuisines as they become popular. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**HRI 207****American Regional Cuisine****3 credits**

Studies the distinct regional cooking styles of America and its neighbors. Emphasizes the indigenous ingredients as well as the cultural aspect of each region's cooking style. Includes the preparation of the various regional foods. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**HRI 215****Food Purchasing****3 credits**

Presents the method and procedures for purchasing food for hotels, restaurants and institutions. Deals with markets, federal and trade grades, governmental regulations, packaging, comparative versions, price buying, yields and quality control. Lecture 3 hours per week.

**HRI 224****Recipe and Menu Management****3 credits**

Presents a comprehensive framework for creating and evaluating recipes and menus for commercial and non-commercial food service operations. Requires students to use microcomputer software to design recipes, recipe files, and menus. Teaches students menu engineering analysis and methods for optimizing menu contribution margin. Lecture 3 hours per week.

**HRI 225****Menu Planning and Dining Room Service****3 credits**

Covers fundamentals of menu writing, types of menus, layout, design and food merchandising, and interpreting a profit and loss statement as it relates to menu pricing. Analyzes menus for effectiveness. Instructs on proper dining room service, customer seating, and dining room management. Emphasizes use of a computer in management of food service operations. Lecture 3 hours per week.

**HRI 235****Marketing of Hospitality Services**

3 credits

Studies principles and practices of marketing the services of the hotel and restaurant industry. Emphasizes the marketing concept with applications leading to customer satisfaction. Reviews methods of external and internal stimulation of sales. May include a practical sales/marketing exercise and computer applications. Lecture 3 hours per week.

**HRI 251****Food and Beverage Cost Control I**

3 credits

Presents methods of pre-cost and pre-control as applied to the menu, purchasing, receiving, storing, issuing, production, sales and service which result in achievement of an operation's profit potential. Emphasizes both manual and computerized approaches. Prerequisite: MTH 121 or equivalent. Lecture 3 hours per week.

**HRI 255****Human Resources Management and Training for Hospitality and Tourism**

3 credits

Prepares the students for interviewing, training and developing employees. Covers management skills (technical, human, and conceptual) and leadership. Covers the establishment and use of effective training and evaluative tools to improve productivity. Emphasizes staff and customer relations. Lecture 3 hours per week.

**HRI 256****Principles and Applications of Catering**

3 credits

Analyzes and compares the principles of on-premise and off-premise catering. Includes student presentations in a series of catered functions where they assume typical managerial/employee positions emphasizing planning, organizing, operating, managing and evaluating. Prerequisite: Divisional approval. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**HRI 265****Hotel Front Office Operations**

3 credits

Analyzes hotel front office positions and the procedures involved in reservations, registration, accounting for and checking out guests, and principles and practices of night auditing. Covers the complete guest operation in both traditional and computerized operations. Lecture 3 hours per week.

**HRI 275****Hospitality Law**

3 credits

Studies legal principles governing hospitality operations. Includes applications of common law and statutory decisions, discussion of legal theory, and regulations governing management of hospitality enterprise. Lecture 3 hours per week.

## Horticulture

**HRT 110****Principles of Horticulture**

3 credits

Introduces concepts of plant growth and development. Covers horticultural practices, crops and environmental factors affecting plant growth. Lecture 3 hours per week.

**HRT 115****Plant Propagation**

3 credits

Teaches principles and practices of plant propagation. Examines commercial and home practices. Provides experience in techniques using seed-spores, cuttings, grafting, budding, layering, and division. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 121-122****Greenhouse Crop Production I-II**

3 credits each

Covers commercial practices related to production of floricultural crops. Considers production requirements, environmental control and management, and cultural

techniques. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 125****Chemicals in Horticulture**

3 credits

Emphasizes basic chemical principles and their application to horticulture. Introduces principles of inorganic and organic chemicals. Studies chemical activities of insecticides, fungicides, herbicides, fertilizers, and growth regulators. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 150****Theory of Landscape Design**

3 credits

Presents the theoretical aspects of landscape planning and design. Uses theory to analyze and solve design problems. Lecture 3 hours per week.

**HRT 155****Plants and Society**

3 credits

Covers the relationship between plants and people and the uses of plants as sources of food, medicine, drugs, spices, beverages, poisons, fibers, oils and plants exudates. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 201-202****Landscape Plants I-II**

3 credits each

Studies landscape use of plants. Considers ornamental value, growth habit, identification, and limitations. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 205****Soils**

3 credits

Teaches theoretical and practical aspects of soils and other growing media. Examines media components, chemical and physical properties, and soil organisms. Discusses management and conservation. Prerequisites: HRT 110 and HRT 125. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 206****Pesticides in Horticulture**

2 credits

Discusses pesticide selection, mixing, application, storage, and disposal. Stresses safety, environmental considerations, and legal restrictions. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**HRT 207****Plant Pest Management**

3 credits

Teaches principles of plant pest management. Covers morphology and life cycles of insects and other small animal pests and plant pathogens. Laboratory stresses diagnosis, chemical and non-chemical control of specific pests, and pesticide safety. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 225****Nursery and Garden Center Management**

3 credits

Covers aspects of nursery management, including culture, plant handling, and facilities layout. Discusses aspects of garden center management, including planning and layout, purchasing, product selection, marketing, merchandising, and display. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 226****Greenhouse Management**

3 credits

Discusses the theoretical and applied practices of managing a greenhouse facility. Emphasizes greenhouse construction and design, environmental control, energy conservation, and related topics. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 227****Professional Landscape Management**

3 credits

Focuses on basic practices and techniques involving landscape management. Includes development of a year round management calendar and preparation of bid and contract proposals. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 228****Turfgrass Management I**

3 credits

Applies scientific principles for the establishment and maintenance of intensely managed turfgrass. Topics covered include cultivation selection, seeding, sprigging and sodding techniques, fertilization, watering, weed identification and control, insect identification and control, fungus identification and control, soil structure, drainage, topdressing, and mowing frequency and height. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 229****Turfgrass Management II**

3 credits

Continuation of HRT 228. Applies scientific principles for the establishment and maintenance of intensely managed turfgrass. Topics covered include cultivator selection, seeding, sprigging and sodding techniques, fertilization, watering, weed identification and control, insect identification and control, fungus identification and control, soil structure, drainage, and mowing frequency and height. Prerequisite: HRT 228. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 231****Planting Design I**

3 credits

Applies landscape theory and principles of drawing to the planning of residential and small scale commercial landscape designs. Prerequisites: HRT 150, 235, 201, and 202 or instructor permission. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 235****Landscape Drawing**

3 credits

Teaches students the use of drafting equipment. Emphasizes drawing techniques and use of media. Includes hard line and free-style landscape drawing. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 240****Principles of Weed Science**

3 credits

Provides in-depth knowledge and expertise in handling the critical tasks of identifying and determining appropriate methods of controlling weeds of turfgrass, landscapes, and greenhouses. Lecture 2 hours. Laboratory 2 hours. Total 4 hour per week.

**HRT 259****Arboriculture**

3 credits

Studies the techniques of tree care. Covers surgery, pruning, insect and disease recognition and control, fertilization, cabling, and lightening rod installation. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**HRT 275****Landscape Construction and Maintenance**

3 credits

Examines practical applications of commercial landscape construction techniques and materials used. Covers construction, planting, and maintenance. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

## Humanities

### HUM 150

#### Introduction to Viet Nam

3 credits

Introduces the culture, history, religion, literature and poetry of Viet Nam. Lecture 3 hours per week.

### HUM 165

#### Controversial Issues in Contemporary American Culture

3 credits

Introduces students to selected issues in contemporary American culture. Includes topic areas ranging from welfare reform, economic development, privacy, environmental protection and conservation, to evolution vs. creation, family values, and special interest lobbying in state and national governments. Focuses on the development of the student's critical thinking skills by analyzing, evaluating, and reflecting on opposing sides of the same issue as expressed by public leaders, special interest groups and academicians. Lecture 3 hours per week.

### HUM 201

#### Survey of Western Culture I

3 credits

Studies thought, values, and arts of Western culture, integrating major developments in art, architecture, literature, music, and philosophy. Covers the following periods: Ancient and Classical, Early Christian and Byzantine, Medieval, and Early Renaissance. Lecture 3 hours per week.

### HUM 202

#### Survey of Western Culture II

3 credits

Studies thought, values, and arts of Western culture, integrating major developments in art, architecture, literature, music, and philosophy. Covers the following periods: Renaissance, Baroque, Enlightenment, Romantic, and Modern. Lecture 3 hours per week.

### HUM 210

#### Introduction to Women's Studies

3 credits

Introduces interdisciplinary and cross-cultural theories that explore gender, race, and class issues relating to women's lives, past and present. Prerequisite: ENG 111. Lecture 3 hours per week.

### HUM 220

#### Introduction to African-American Studies

3 credits

Presents an interdisciplinary approach to the study of African-American life, history, and culture. Examines the specific events, ideologies, and individuals that have shaped the contours of African-American life. Studies the history, sociology, economics, religion, politics, psychology, creative productions, and culture of African-Americans and their impact on white America. Lecture 3 hours per week.

### HUM 235

#### Filipino-American Culture

3 credits

Surveys the cultural history of the Filipinos in the United States from early immigration until the present. Studies history, cultural values, social and economic life, music, dance, art, and literature, including acculturation and assimilation. Lecture 3 hours per week.

### HUM 241-242

#### Interdisciplinary Principles of the Humanities I-II

3 credits each

Integrates unifying principles of the humanities and related fields of study. Emphasizes the expansion of student's intellectual perspective and development of concepts enabling the integration of knowledge from diverse fields into a unified whole. Lecture 3 hours per week.

### HUM 246

#### Creative Thinking

3 credits

Examines and analyzes creative and effective thinking processes with applications in individual and group projects to solve

business, scientific, environmental, and other practical problems. Lecture 3 hours per week.

### HUM 247

#### Chronicles of the Sea

3 credits

Studies the ocean and man's relationship with it. Covers the study of selected readings about the sea from a literary, historical and social/political perspective. May include field trips, reports, and a sea voyage. Lecture 3 hours per week.

### HUM 256

#### Mythology in Literature and the Arts

3 credits

Studies cultural expressions of mythology in literature and the arts. Considers several of the following mythologies, with emphasis on parallels and divergences: Egyptian, Near-Eastern, Greek, Roman, Celtic, Norse, Asian, and African. Lecture 3 hours per week.

### HUM 259

#### Greek Mythology

3 credits

Surveys and analyzes major stories from Greek Mythology. Explores psychological, anthropological, and historical interpretations of the myths. Acquaints students with recurring mythological themes in language, art, music, and literature. Lecture 3 hours per week.

### HUM 260

#### Survey of Twentieth-Century Culture

3 credits

Explores literature, visual arts, philosophy, music, and history of our time from an interdisciplinary perspective. Lecture 3 hours per week.

## Interior Design

### IDS 100

#### Theory and Techniques of Interior Design

3 credits

Introduces drafting and presentation, color theory, and coordination, space planning and arrangement of furnishings. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### IDS 105

#### Architectural Drafting for Interior Design

3 credits

Introduces tools and equipment, lettering, methods of construction, designing and delineation of architecture. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### IDS 106

#### Three-Dimensional Drawing and Rendering

3 credits

Provides instruction in graphic presentation of three-dimensionally drawn interiors. Presents the use of colored media to render three-dimensional drawings. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### IDS 109

#### Styles of Furniture and Interiors

3 credits

Teaches history of furnishings and interiors from the ancient world to the present. Lecture 3 hours per week.

### IDS 116

#### Period Residential Design

4 credits

Plans a period-inspired interior. May use field trips and visual materials to enhance this project. Presents problems and their solutions found in this kind of project. May require a final visual presentation with all necessary furnishings, materials, and color boards with rendered perspectives. Prerequisites: 217. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

### IDS 120

#### Estimation for Interior Coverings

3 credits

Provides instruction in estimation of yardages for window treatments, carpet, custom carpet designs, wall coverings, tile, etc. Covers fixturing, labor costing, procedures of fabrication and styling options. May require site/research visits to fabricators. Lecture 3 hours per week.

### IDS 205

#### Materials and Sources

3 credits

Presents textiles, floor and wall coverings, and window treatments. Emphasizes construction, fiber, finish, and code applications. May use research and field trips to trade sources representing these elements. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### IDS 206

#### Lighting and Furnishings

3 credits

Provides instruction in lighting terminology and calculations and instructions in techniques of recognizing quality of construction in furnishings and related equipment. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### IDS 215

#### Theory and Research in Commercial Design

3 credits

Teaches graphic standards and specifications in interior design. Explains handicap codes and fire codes for large scale spaces. Provides programming and space planning with emphasis on systems furniture. Prerequisite: IDS 105. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### IDS 217

#### Advanced Rendering and Presentation

3 credits

Gives advanced problems in rendering and visual presentation. Teaches methods of presentation and development of completed interior design projects with rendered perspectives and presentation boards of

furnishings, fixtures, finishes, schedules, and related materials. Prerequisite: IDS 106.

Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

### IDS 222

#### Designing Commercial Interiors II

4 credits

Presents problems in designing and developing presentations with emphasis on office spaces. Prerequisite: IDS 217. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

### IDS 225

#### Business Procedures

3 credits

Provides instruction in preparation of contracts, purchase orders, specifications, and other business forms used in the interior design field. Lecture 3 hours per week.

### IDS 235

#### Antiques

3 credits

Involves process of research, authentication, and determining provenance. Covers examples of furnishings, fixtures, textiles, glass, and ceramics. May provide field trips, lectures, examination, and discussion to assist in determining age, condition, and other properties. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### IDS 245

#### Computer Aided Drafting for Interior Designers

3 credits

Instructs in the use of the computer for drafting of floor plans, elevations, perspectives, shadowing, lighting, and color applications using Auto Cad software and the architectural and engineering software. Prerequisite: IDS 105. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

## Industrial Engineering Technology

### IND 101-102

#### Quality Assurance Technology I-II 3 credits each

Studies principles and techniques of quality engineering for the management, design, engineering, economics, production, and assurance of quality. Emphasizes fundamentals of total quality assurance for product and process control. May include design review, fundamentals of statistics, procurement control, sampling and control chart systems, quality reporting, process capability analysis, tool and gauge control, document control, or troubleshooting quality control. Lecture 3 hours per week.

### IND 105

#### Nondestructive Inspection (NDI) and Testing 3 credits

Studies nondestructive inspection and testing methods as they relate to industry. May include radiographic (RT), ultrasonic (UT), eddy current (ET), magnetic particle (MT), and liquid penetrant (PT) or other methods of testing. Lecture 3 hours per week.

### IND 106

#### Industrial Engineering Technology 3 credits

Introduces basic skills required for a career in industrial engineering technology. Includes basic statistics for engineering technicians, the SI system, graphic analysis, and careers as an industrial engineering technician. Lecture 3 hours per week.

### IND 109

#### Force, Mass, & Torque Measurement 2 credits

Introduces the basic concepts, theories, and applications of Force, Mass, and Torque measurement. Includes a history of Force, Mass, and Torque measurement and the concepts of the transducers and measuring systems used to make such measurements. Incorporates traceability, documentation, and uncertainty analysis into the measurement process as required

for laboratory accreditation to ISO 17025. Prerequisite: MTH 115 or equivalent. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

### IND 115

#### Materials and Processes of Industry 4 credits

Studies materials and processes for the manufacture of products. Investigates the nature of various materials. Examines the manufacturing processes of industry and their effects on materials. Lecture 4 hours per week.

### IND 121

#### Industrial Supervision I 3 credits

Introduces the concept of the supervisor as a leader. Discusses the role of the Industrial Supervisor in the face of technology advances. Discusses the role of the Industrial Supervisor in leading organizational change and helping employees through transitions. Defines leadership styles and the selection of the appropriate style. Introduces the Industrial Supervisor as a motivator in terms of job satisfaction, morale, job design, competition, communication, and promotions. Presents ethical behavior and dilemmas in organizations. Lecture 3 hours per week.

### IND 122

#### Industrial Supervision II 3 credits

Introduces the concept of the supervisor as a manager. Discusses the primary management functions and the differences between supervision and management. Discusses the planning process and scheduling techniques. Introduces concepts in organizing both formally and informally, accountability, span of control and delegation. Discusses the staffing process including legal considerations, forecasting, job analysis techniques, recruiting, interviewing and selection. Introduces the control process including what the Industrial Supervisor should control, control strategies, and how to control costs. Defines the decision making process and how to use

employees, information and creativity in decision making. Lecture 3 hours per week.

### IND 135

#### Standards of Quality and Auditing 3 credits

Presents general requirements of industrial, military and international quality standards. Reviews quality audit principles relative to products, processes and systems. Includes the design of an approach to the audit and audit standards, procedures, methods, facilities control, personnel, and reporting methods. Includes case studies and in-plant audits. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### IND 137

#### Team Concepts and Problem Solving 3 credits

Studies team concepts and problem solving techniques to assist project teams in improving quality and productivity. Provides knowledge of how to work as a team, plan and conduct good meetings, manage logistics and details, gather useful data, communicate the results and implement changes. Lecture 3 hours per week.

### IND 145

#### Introduction to Metrology 3 credits

Studies principles of measurement and calibration control, application of statistics to measurement processes, and standards of measurements in calibration. May include the use of gauges and instruments in modern production and dimensional control concepts. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### IND 146

#### Statistical Quality Control 3 credits

Studies essentials and application of statistics in quality control function. May include definitions and uses of averages, standard deviations, ranges, and sampling plans. May discuss dependent and independent variables and distribution probabilities. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**IND 150****Industrial Management****3 credits**

Studies planning, organizing, directing, and influencing industrial activities. May include research, product design, methods and time management, quality assurance and current manufacturing methodologies. Lecture 3 hours per week.

**IND 159****Precision Dimensional Measurement****3 credits**

Introduces the basic concepts, theories, and applications of Precision Dimensional measurement. Includes a history of Precision Dimensional measurement and the concepts of the transducers and measuring systems used to make such measurements. Incorporates traceability, documentation, and uncertainty analysis into the measurement process as required for laboratory accreditation to ISO 17025. Prerequisite: MTH 115 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**IND 160****Introduction to Robotics****3 credits**

Studies evolution and history of robotics with an emphasis on automated and flexible manufacturing. Presents advantages and limitations of present robot systems. Lecture 3 hours per week.

**IND 165****Principles of Industrial Technology I****4 credits**

Introduces principle concepts of technology involving mechanical, fluid, electrical, and thermal power as they relate to force, work, and rate. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**IND 166****Principles of Industrial Technology II****4 credits**

Introduces principle concepts of technology involving mechanical, fluid, electrical, and thermal power as they relate to resistance, energy, power, and force transformers. Places an emphasis on mechanical and advantage

systems. Prerequisite: IND 165. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**IND 175****Pressure Measurement****2 credits**

Introduces the basic concepts, theories, and applications of Pressure measurement. Includes a history of Pressure measurement and the concepts of the transducers and measuring systems used to make such measurements. Incorporates traceability, documentation and uncertainty analysis into the measurement process as required for laboratory accreditation to ISO 17025. Prerequisite: MTH 115 or equivalent. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**IND 203****Temperature and Humidity Measurement****2 credits**

Introduces the basic concepts, theories, and applications of Temperature and Humidity measurement. Includes a history of Temperature and Humidity measurement and the concepts of transducers and measuring systems used to make such measurements. Incorporates traceability, documentation, and uncertainty analysis in the measurement process as required for laboratory accreditation to ISO 17025. Prerequisite: Mth 115 or equivalent. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**IND 204****Opto-Mechanical Measurement of Angles and Surfaces****2 credits**

Introduces the basic concepts, theories, and applications of Optical and Mechanical measurement of angles and surfaces. Includes a history of angle and surface measurement and the concepts of the transducers and measuring systems used to make angle and surface measurements. Incorporates traceability, documentation, and uncertainty analysis into the measurement process as required

for laboratory accreditation to ISO 17025.

Prerequisite: Mth 115 or equivalent. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**IND 205****Flow, Viscosity, and Specific Gravity Measurement****2 credits**

Introduces the basic concepts, theories, and applications of Flow, Viscosity, and Specific Gravity measurement. Includes a history of Flow, Viscosity, and Specific Gravity measurements and the concepts of the transducers and measuring systems used to make such measurements. Incorporates traceability, documentation, and uncertainty analysis into the measurement process as required for laboratory accreditation to ISO 17025. Prerequisite: Mth 115 or equivalent. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**IND 216****Plant Layout and Materials Handling****3 credits**

Examines arrangement and layout of physical facilities. Explains material handling and modern techniques for efficient utilization of space. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**IND 236****Total Quality Concepts****3 credits**

Discusses the fundamentals of Total Quality. Compares and contrasts the philosophies of the recognized experts on the subject. Discusses cultural change, continuous process improvement, and strategic planning. Introduces team skills and concepts. Emphasizes the systems approach to Total Quality philosophy. Lecture 3 hours per week.

**IND 237****Fundamentals of ISO 9000**

3 credits

Presents the basics of ISO 9000 standards. Focuses on the latest improvements of the standards and the redesigned quality concepts set forth by the International Organization for Standardization (ISO). Includes an historical overview of the evolution of quality systems and explains the purpose of ISO quality systems certification. Discusses implementation approaches. Lecture 3 hours per week.

**IND 245****Time and Motion Study**

3 credits

Studies principles and applications of motion analysis, process, operations, and micro-motion study; methods of improvement, work simplification, standardization, rating, allowance and analysis of time data. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**IND 251****Automated Manufacturing Systems I**

3 credits

Presents basic principles used in the design and implementation in manufacturing work cells. Includes selection of the robot system, worksite, application cell sensors, development of cycle times, and economic analysis. P Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

## Interpreter Education

**INT 105-106****Interpreting Foundations I-II**

3 credits each

Develops fundamental skills of interpreting, including cognitive processes and intralingual language development in English and ASL. Reviews Process Models of Interpreting, and uses one to analyze interpretations. Develops feedback skills essential to the team interpreting process. Prerequisite: Placement into ASL 261 and ENG 111. Lecture 3 hours per week.

**INT 107****Translation Skills**

3 credits

Further develops fundamental skills needed for the task of interpreting. Targets comprehending source language (either ASL or English), transferring content into memory store (breaking from original form), restructuring into target language, maintaining message equivalence, conveying implicit and inferred information, and applying appropriate discourse structure. Reviews Process Models of Interpreting, and uses it to analyze translations. Further develops feedback skills essential to the team interpreting process. Prerequisite: INT 105. Lecture 3 hours per week.

**INT 130****Interpreting: An Introduction to the Profession**

3 credits

Introduces basic principles and practices of interpreting, focusing on the history of the profession, logistics of interpreting situations, regulatory and legislative issues, resources, and the Code of Ethics. Describes the state quality assurance screening and national certification exam systems, including test procedures. Lecture 3 hours per week.

**INT 133****ASL-to-English Interpretation I**

3 credits

Begins consecutively interpreting monologues from the source language (ASL) to the target language (English). Watch entire ASL monologues, process them, analyze them, and then choose appropriate English to match the message. Eventually interpret the monologue into English. Puts interpreting theory into practice in a lab environment. Conducts research in the field of interpretation. Develops team interpreting techniques. Interacts with consumers of ASL-English interpretation. Prerequisite: INT 107. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**INT 134****English-to-ASL Interpretation I**

3 credits

Begins consecutively interpreting monologues from the source language (English) to the target language (ASL). Listen to entire English monologues, process them, analyze them, then choose appropriate ASL to match the message. Puts interpreting theory into practice in a lab environment. Conducts research into the field of interpretation. Develops team interpreting techniques. Encourages interaction with consumers of ASL-English interpretation. Prerequisite: INT 107. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**INT 233****ASL-to-English Interpretation II**

3 credits

Perform simultaneous interpretations of monologues in the source language (ASL) to the target language (English). Process an incoming ASL monologue while simultaneously producing an appropriate interpretation in English. Conduct research in the field of interpretation. Apply team interpreting techniques. Interact with consumers of interpretation. Prerequisite: INT 133 and INT 134. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**INT 234****English-to-ASL Interpretation II**

3 credits

Perform simultaneous interpretations of monologues in the source language (English) into the target language (ASL). Process an incoming English monologue while simultaneously producing an appropriate interpretation in ASL. Conduct research in the field of interpretation. Apply team interpreting techniques. Interact with consumers of interpretation. Prerequisite: INT 133 and INT 134. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**INT 235****Interpreting in the Educational Setting**  
3 credits

Examines the roles, responsibilities, and communication techniques of the educational setting. Provides information on the nature and needs of the deaf student and methods used in working with students who are deaf and hard of hearing. Describes various communication systems used for a variety of educational environments. Prerequisite: ASL 102 and INT 130. Lecture 3 hours per week.

**INT 236****Interpreting in Special Situations**  
3 credits

Studies roles, responsibilities, and qualifications involved in interpreting in specific settings, such as medical, legal, conference, religious, and performing arts. Addresses specific linguistic and ethical concerns for each. Prerequisite: ASL 102 and INT 130. Lecture 3 hours per week.

**INT 250****Dialogic Interpretation I**  
3 credits

Apply interpreting fundamentals. Interpret dialogs between spoken English and ASL users. Analyze interpretations by using a Process Model of Interpreting. Conduct research. Practice team interpreting skills in an interactive interpreting environment. Prepare for the interactive nature of standard interpreting evaluations. Prerequisites: INT 233 and INT 234. Lecture 3 hours per week.

**Information Technology  
Design & Database****ITD 110****Web Page Design**  
4 credits

Stresses a working knowledge of web site designs, construction, and management using HTML or XHTML. Includes headings, lists, links, images, image maps, tables, forms, and frames. Lecture 4 hours per week.

**ITD 112****Designing Web Page Graphics**  
4 credits

Explores the creation of digital graphics for web design. Basic design elements such as color and layout will be explored utilizing a computer graphics program(s). Lecture 4 hours per week.

**ITD 132****Structured Query Language**  
4 credits

Incorporates a working introduction to commands, functions and operators used in SQL for extracting data from standard databases. Lecture 4 hours per week.

**ITD 134****PL/SQL Programming**  
4 credits

Presents a working introduction to PL/SQL programming within the Oracle RDBMS environment. Includes PL/SQL fundamentals of block program structure, variables, cursors and exceptions, and creation of program units of procedures, functions, triggers and packages. Prerequisite: ITD 132 or SQL knowledge. Lecture 4 hours per week.

**ITD 136****Database Management Software**  
4 credits

Covers an introduction to relational database theory and how to administer and query databases using multiple commercial database systems. Lecture 4 hours per week.

**ITD 152****Oracle Forms Developer**  
4 credits

Provides a working introduction to building and testing interactive Oracle applications. Includes customizing forms with user input items such as check boxes, list items, and radio groups for use in a graphical user interface (GUI) environment. Includes modification of data access by creating event-related triggers. Prerequisite: ITD 134 or SQL and PL/SQL knowledge. Lecture 4 hours per week.

**ITD 210****Web Page Design II**  
4 credits

Incorporates advanced techniques in web site planning, design, usability, accessibility, advanced site management, and maintenance utilizing web editing software(s). Prerequisite: ITD 110. Lecture 4 hours per week.

**ITD 212****Interactive Web Design**  
4 credits

Provides techniques in interactive design concepts to create cross-platform, low-bandwidth animations utilizing a vector based application. Emphasizes the importance of usability, accessibility, optimization and performance. Prerequisite: ITD 112. Lecture 4 hours per week.

**ITD 250****Database Architecture and Administration**  
4 credits

Involves in-depth instruction about the underlying architecture of databases and the handling of database administration. Prerequisite: ITD 132 and ITN 171. Lecture 4 hours per week.

**ITD 251****Database System Development**

3 credits

Provides the student the opportunity to solve a business problem from identification of the problem through the logical design and implementation on a database. Makes use of the knowledge that was gained in the prerequisite courses. Lecture 3 hours per week.

**ITD 260****Data Modeling and Design**

4 credits

Introduces life cycle application development methodologies in a systematic approach to developing relational databases and designing applications. This course presents content introducing functional and business process modeling, using modeling information to produce application designs, analyzing data requirements as entities, attributes, and relationships and map an entity relationship diagram to an initial database design. Identifies the available automated development tools and utilizes Oracle Developer software to perform practical applications of these concepts. Co-requisite: ITD 132 should be taken prior to or with ITD 260. Lecture 4 hours per week.

**ITD 295****Database Backup and Recovery and Performance Tuning**

4 credits

Teaches the key tasks required to plan and implement a database backup and recovery strategy. Includes instruction in multiple strategies to recover from multiple types of failure. Provides instruction to optimize the performance of a database management system. Includes methods for tuning data access and storage and discussions of resolving database performance problems. Prerequisites: ITD 250 and ITN 171. Lecture 4 hours per week.

**Information Technology Essentials****ITE 55****Certification Preparation**

1 credit

Serves as a review of objectives for a specific Certification. Uses certification test preparation software, when available, in conjunction with a faculty resource person. May be repeated for credit. Lecture 1 hour per week.

**ITE 101****Introduction to Microcomputers**

2 credits

Examines concepts and terminology related to microcomputers and introduces specific uses of microcomputers. Lecture 2 hours per week.

**ITE 109****Information Systems for Legal Assistants**

3 credits

Presents terminology and concepts of computer-based systems, an introductory coverage of operating systems and business application software to conduct legal research for litigation and other application programs traditionally used in the practice of law. Lecture 3 hours per week.

**ITE 115****Introduction to Computer Applications and Concepts**

4 credits

Covers computer concepts and internet skills and uses a software suite which includes word processing, spreadsheet, database, and presentation software to demonstrate skills. Lecture 4 hours per week.

**ITE 127****Microcomputer Software: Beginning Windows**

1 credit

Imparts first-time users with sufficient information to make practical use of the Windows software package. Presents the basics of the features and applications included in the Windows operating system package. Lecture 1 hour per week.

**ITE 130****Introduction to Internet Services**

4 credits

Provides students with a working knowledge of Internet terminology and services including e-mail, WWW browsing, search engines, ftp, file compression, and other services using a variety of software packages. Provides instruction for basic web page construction. Lecture 4 hours per week.

**ITE 131****Survey of Internet Services**

1 credit

Introduces students to basic Internet terminology and services including e-mail, WWW browsing, search engines, ftp, telnet, and other services. Lecture 1 hour per week.

**ITE 140****Spreadsheet Software**

4 credits

Covers the use of spreadsheet software to create spreadsheets with formatted cells and cell ranges, control pages, multiple sheets, charts, and macros. Topics include type and edit text in a cell, enter data on multiple worksheets, work with formulas and functions, create charts, pivot tables, and styles, insert headers and footers, and filter data. Covers MOS Excel objectives. Lecture 4 hours per week.

**ITE 141****Microcomputer Software: Spreadsheets**

1 credit

Provides first-time users sufficient information to make practical use of spreadsheet software using the basics of building spreadsheets. Lecture 1 hour per week.

**ITE 150****Desktop Database Software**

4 credits

Incorporates instruction in planning, defining, and using a database; performing queries; producing reports; working with multiple files; and concepts of database programming. Includes database concepts, principles of table design and table relationships, entering data, creating and

using forms, using data from different sources, filtering, creating mailing labels. Covers MOS Access certification objectives. Lecture 4 hours per week.

**ITE 151**  
**Microcomputer Software: Database Management**  
1 credit

Presents first-time users with sufficient information to make practical use of database management software using the basics of building databases. Covers specific business applications. Lecture 1 hour per week.

**ITE 200**  
**Technology for Teachers (TSIP)**  
3 credits

Provides K-12 classroom teachers with the knowledge and skills needed to fulfill the Commonwealth of Virginia's Technology Standards for Instructional Personnel. Students will finish the course with a solid understanding of educational technology, including how to use computers, how to access information on the World Wide Web, and how to integrate computers and educational technology into classroom curriculum. Students will learn how to base technology integration decisions on contemporary learning theories. Prerequisite: ITE 115. Lecture 3 hours per week.

**ITE 215**  
**Advanced Computer Applications and Integration**  
4 credits

Incorporates advanced computer concepts including the integration of a software suite. Prerequisite: ITE 115. Lecture 4 hours per week.

## Information Technology Networking

**ITN 101**  
**Introduction to Network Concepts**  
4 credits

Provides instruction in networking media, physical and logical topologies, common networking standards and popular networking protocols. Emphasizes the TCP/IP protocol suite and related IP addressing schemes, including CIDR. Includes selected topics in network implementation, support and LAN/WAN connectivity. Prerequisite: ITN 106 or ITN 171 or ITN 114, in some programs. Lecture 4 hours per week.

**ITN 106**  
**Microcomputer Operating Systems**  
4 credits

Teaches use of operating system utilities and multiple-level directory structures, creation of batch files, and configuration of microcomputer environments. May include a study of graphical user interfaces. Maps to A+ Software certification. Lecture 4 hours per week.

**ITN 107**  
**Personal Computer Hardware and Troubleshooting**  
4 credits

Includes specially designed instruction to give students a basic knowledge of hardware and software configurations. Includes the installation of various peripheral devices as well as basic system hardware components. Maps to A+ Hardware Certification. Lecture 4 hours per week.

**ITN 109**  
**Internet and Network Foundations**  
4 credits

Provides a basic comprehension of Internet and network technologies including IT job roles, connection methods, TCP/IP functionality and DNS. Explores web server technologies with security and project management concepts. Introduces network creation, physical and logical topologies including media properties, server types, IP addressing and network security. Lecture 4 hours per week.

**ITN 114**  
**Windows XP Professional**  
4 credits

Consists of instruction in installation, configuration, administration, and troubleshooting of Windows XP Professional as a desktop operating system in a networked data communications environment. Lecture 4 hours per week.

**ITN 115**  
**Windows 2003 Server (SER)**  
4 credits

Consists of instruction that teaches students how to manage and maintain a Microsoft Windows Server 2003 environment. Lecture 4 hours per week.

**ITN 116**  
**Windows 2003 Network Infrastructure Implementation, Management and Maintenance (NI-IMM)**  
4 credits

Provides instruction on how to implement, manage, and maintain a Microsoft Windows Server 2003 network infrastructure. Lecture 4 hours per week.

**ITN 117**  
**Windows 2003 Network Infrastructure Planning and Maintenance (NI-PIM)**  
4 credits

Includes instruction on how to plan and maintain a Microsoft Windows Server 2003 network infrastructure. Lecture 4 hours per week.

**ITN 118**  
**Windows 2003 Active Directory Infrastructure Planning**  
4 credits

Encompasses instruction on how to plan, implement, and maintain a Microsoft Windows Server 2003 Active Directory infrastructure. Lecture 4 hours per week.

**ITN 131****Novell Fundamentals of Networking Network 6.X**

4 credits

Provides instruction in basic knowledge of the layers of the OSI model and the features/functions of the components that make up a network. Includes installation, configuration, and troubleshooting of basic networking hardware peripherals and protocols. Prerequisite: ITN 101. Lecture 4 hours per week.

**ITN 150****Networking Fundamentals and Introductory Routing – Cisco**

4 credits

Contains an introduction to the functions of the layers of the OSI reference model, data link and network addresses, data encapsulation, different classes of IP addresses and subnetting, and the functions of the TCP/IP network-layer protocols. Includes features of the Cisco IOS software, including login, context-sensitive help, command history and editing, loading software, configuring and verifying IP addresses, preparing the initial configuration of a router, and adding routing protocols to the router configuration. Prerequisite: ITN 101. Lecture 4 hours per week.

**ITN 151****Introductory Routing and Switching – Cisco**

4 credits

Encompasses instruction in the advantages of LAN segmentation using bridges, routers, and switches. Includes Spanning Tree Protocol and Virtual LANs as well as multiprotocol support and traffic filtering. Includes network design issues and differences between the following WAN services: LAPB, Frame Relay, ISDN, HDLC, and PPP. Prerequisite: ITN 150. Lecture 4 hours per week.

**ITN 170****Linux System Administration**

4 credits

Focuses instruction on the installation, configuration and administration of the Linux operating system and emphasizes the use of Linux as a network client and workstation. Prerequisite: ITN 171. Lecture 4 hours per week.

**ITN 171****Unix I**

4 credits

Provides an introduction to UNIX operating systems. Teaches login procedures, file creation, UNIX file structure, input/output control, and the UNIX shell. Lecture 4 hours per week.

**ITN 224****Web Server Management**

4 credits

Focuses on the Web Server as a workhorse of the World Wide Web (WWW). Teaches how to set up and maintain a Web server and provides in-depth instruction in Web server operations and provides hands-on experience in installation and maintenance of a Web server. Prerequisite: ITN 109. Lecture 4 hours per week.

**ITN 240****Windows 2003 Active Directory and Network Infrastructure Design (AD-NID)**

4 credits

Includes instruction that teaches students how to design a Microsoft Windows Server 2003 Active Directory and network infrastructure. Prerequisite: ITN 115. Lecture 4 hours per week.

**ITN 241****Windows 2003 Security Design (SD)**

4 credits

Provides instruction that shows students how to gather and analyze business requirements for a secure network infrastructure and design a security solution that meets those requirements. Prerequisite: ITN 115. Lecture 4 hours per week.

**ITN 242****Windows Microsoft Exchange 2003 Server (ES03)**

4 credits

Incorporates instruction on how to implement, manage, and troubleshoot an Exchange Server 2003 organization. Prerequisite: ITN 115. Lecture 4 hours per week.

**ITN 243****Windows 2003 Security Implementation and Administration (S-IA)**

4 credits

Consists of instruction on how to implement, manage, maintain, and troubleshoot security in a Windows Server 2003 network infrastructure and also plan and configure a Windows Server 2003 PKI. Prerequisite: ITN 115. Lecture 4 hours per week.

**ITN 250****Advanced Routing – Cisco**

4 credits

Includes the characteristics of various Routing Protocols used in the TCP/IP networking environment, static routing, OSPF, IGRP, EIGRP, BGP, advanced IP addressing, and security. Examines various strategies for optimizing network routing performance. Prerequisite: ITN 150. ITN 151 should be taken prior to or with ITN 250. Lecture 4 hours per week.

**ITN 251****Remote Access Networking – Cisco**

4 credits

Focuses on in-depth instruction to a variety of wide area networking technologies and their implementation. Includes POTS and analog network connectivity, ISDN (both BRI and PRI), PPP, Cisco, AAA Security System, and Frame Relay. Prerequisite: ITN 151. Lecture 4 hours per week.

**ITN 252****Advanced Switching – Cisco**

4 credits

Provides in-depth instruction in switching as a core technology in today's networking environment. Includes VLANs, trunking protocols, spanning-tree protocol, HSRP, and multi-layer switching. Prerequisite: ITN 151. Lecture 4 hours per week.

**ITN 253****Network Troubleshooting – Cisco**

4 credits

Provides instruction in troubleshooting tools and techniques appropriate to the network communications environment. Includes workstation troubleshooting software, communication equipment troubleshooting options, and typical problems related to Switching, WAN, and routing technologies. Prerequisites: ITN 250, ITN 251, and ITN 252. Lecture 4 hours per week.

**ITN 260****Network Security Basics**

4 credits

Provides instruction in the basics of network security in depth. Includes security objectives, security architecture, security models and security layers, risk management, network security policy, and security training. Includes the give security keys, confidentiality integrity, availability, accountability, and audit ability. Prerequisite: ITN 101 or substantial networking experience. Lecture 4 hours per week.

**ITN 261****Network Attacks, Computer Crime and Hacking**

4 credits

Encompasses in-depth exploration of various methods for attacking and defending a network. Explores network security concepts from the viewpoint of hackers and their attack methodologies. Includes topics about hackers, attacks, Intrusion Detection Systems (IDS), malicious code, computer crime and industrial espionage. Prerequisite: ITN 260. Lecture 4 hours per week.

**ITN 262****Network Communication, Security and Authentication**

4 credits

Covers an in-depth exploration of various communication protocols with a concentration on TCP/IP. Explores communication protocols from the point of view of the hacker in order to highlight protocol weaknesses. Includes Internet architecture, routing, addressing, topology, fragmentation and protocol analysis, and the use of various utilities to explore TCP/IP. Prerequisite: ITN 260. Lecture 4 hours per week.

**ITN 263****Internet/Intranet Firewalls and e-Commerce Security**

4 credits

Conveys an in-depth exploration of firewall, Web security, and e-commerce security. Explores firewall concepts, types, topology and the firewall's relationship to the TCP/IP protocol. Includes client/server architecture, the Web server, HTML and HTTP in relation to Web security, and digital certification, D.509, and public key infrastructure (PKI). Prerequisite: ITN 260. Lecture 4 hours per week.

**ITN 266****Network Security Layers**

4 credits

Provides an in-depth exploration of various security layers needed to protect the network. Explores network security from the viewpoint of the environment in which the network operates and the necessity to secure that environment to lower the security risk to the network. Includes physical security, personnel security, operating system security, software security and database security. Prerequisite: ITN 260. Lecture 4 hours per week.

**ITN 267****Legal Topics in Network Security**

3 credits

Conveys an in-depth exploration of the civil and common law issues that apply to network security. Explores statutes, jurisdictional, and constitutional issues related to computer crimes and privacy. Includes rules of evidence, seizure and evidence handling, court presentation and computer privacy in the digital age. ITN 260 should be taken prior to or with ITN 267. Lecture 3 hours per week.

**ITN 270****Advanced Linux Network Administration**

4 credits

Focuses instruction on the configuration and administration of the Linux operating system as a network server. Emphasizes the configuration of common network services such as routing, http, DNS, DHCP, ftp, telnet, SMB, NFS, and NIS. Prerequisite: ITN 170. Lecture 4 hours per week.

**ITN 275****Incident Response and Computer Forensics**

4 credits

Prepares the student for a role on an organizational IT support staff where the need for resolving computer incidents is becoming increasingly common. Includes legal and ethical issues of search and seizure of computer and peripheral storage media leading to laboratory exercises examining computers configured with mix of both simulated criminal and other activities which are not criminal in nature, but do violate scenario-driven organizational policy. Requires the student to make choices/recommendations for further pursuit of forensics evidence gathering and analysis. Students will select and gather the utilities and procedures necessary for a court-acceptable forensics toolkit which will then be used to gather and examine specially configured desktop computers. Students will then participate in a mock court proceeding using the collected evidence. Prerequisite: ITN 260. Lecture 4 hours per week.

**ITN 293**  
**Windows SQL Server**  
 4 credits

Stresses instruction in planning, installing, configuring, administering, maintaining, optimizing, auditing, and troubleshooting Windows SQL Server. Prerequisite: ITN 115 or instructor permission. Lecture 4 hours per week.

## Information Technology Programming

**ITP 100**  
**Software Design**  
 4 credits

Introduces principles and practices of software development. Includes instruction in critical thinking, problem solving skills, and essential programming logic in structured and object-oriented design using contemporary tools. Lecture 4 hours per week.

**ITP 112**  
**Visual Basic.NET I**  
 4 credits

Concentrates instruction in fundamentals of object-oriented programming using Visual Basic.NET and the .NET Framework. Emphasizes program construction, algorithm development, coding, debugging, and documentation of graphical user interface applications. Prerequisite: ITP 100 or programming experience. Lecture 4 hours per week.

**ITP 120**  
**Java Programming I**  
 4 credits

Entails instruction in fundamentals of object-oriented programming using Java. Emphasizes program construction, algorithm development, coding, debugging, and documentation of console and graphical user interface applications. Prerequisite: ITP 100 or programming experience. Lecture 4 hours per week.

**ITP 132**  
**C++ Programming I**  
 4 credits

Centers instruction in fundamentals of object-oriented programming and design using C++. Emphasizes program construction, algorithm development, coding, debugging, and documentation of C++ applications. Prerequisite: ITP 100 or programming experience. Lecture 4 hours per week.

**ITP 136**  
**C# Programming I**  
 4 credits

Presents instruction in fundamentals of object oriented programming and design using C#. Emphasizes program construction, algorithm development, coding, debugging, and documentation of applications within the .NET Framework. Prerequisite: ITP 100 or programming experience. Lecture 4 hours per week.

**ITP 193**  
**Introduction to Modeling and Simulation**  
 3 credits

Introduces the student to the concepts and terminology of the modeling and simulation field. Familiarizes the student with the types of software used. Exposes student to simulation software through projects. Includes analysis of project results. Discusses distributed simulation techniques and simulation protocols. Prerequisite: ITE 115. Lecture 3 hours per week.

**ITP 212**  
**Visual Basic.NET II**  
 4 credits

Includes instruction in application of advanced event-driven techniques to application development. Emphasizes database connectivity, advanced controls, web forms, and web services using Visual Basic.NET. Prerequisite: ITP 112. Lecture 4 hours per week.

**ITP 220**  
**Java Programming II**  
 4 credits

Imparts instruction in application of advanced object-oriented techniques to application development using Java. Emphasizes database connectivity, inner classes, collection classes, networking, and threads. Prerequisite: ITP 120. Lecture 4 hours per week.

**ITP 232**  
**C++ Programming II**  
 4 credits

Presents in-depth instruction of advanced object-oriented techniques for data structures using C++. Prerequisite: ITP 132. Lecture 4 hours per week.

**ITP 236**  
**C# Programming II**  
 4 credits

Focuses instruction in advanced object-oriented techniques using C# for application development. Emphasizes database connectivity and networking using the .NET Framework. Prerequisite: ITP 136. Lecture 4 hours per week.

**ITP 240**  
**Server Side Programming**  
 4 credits

Centers around instruction in fundamentals of Internet application design, development, and deployment. Includes implementation of server component models, security, and database connectivity using server-side programming. Prerequisites: ITD 132 and ITD 110. Lecture 4 hours per week.

**ITP 242**  
**ASP Server Side Scripting**  
 4 credits

Provides instruction in creation of ASP.NET Web applications to deliver dynamic content to a Web site utilizing server controls, web forms, and web services to accomplish complex data access tasks. Prerequisite: ITD 132. Lecture 4 hours per week.

**ITP 251****Systems Analysis and Design**

3 credits

Focuses on application of information technologies (IT) to system life cycle methodology, systems analysis, systems design, and system implementation practices. Covers methodologies related to identification of information requirements, feasibility in the areas of economic, technical and social requirements, and related issues are included in course content. Software applications may be used to enhance student skills. Prerequisite: ITP 100 and one semester of an approved programming language. Lecture 3 hours per week.

**ITP 293****Modeling and Simulation Protocols**

4 credits

Expands techniques of object-oriented programming. Familiarizes the student with the fundamentals of distributed simulation. Presents a historical perspective of modeling and simulation network communication protocols and utilizes these protocols in sample applications. Prerequisite: ITP 193 (Introduction to Modeling and Simulation) and ITP 120. Lecture 4 hours per week.

**ITP 293****Modeling and Simulation Applications**

4 credits

Expands understanding of protocols within distributed applications. Utilizes modeling and simulation protocols for network communication in distributed simulations. Presents programming of behavioral and physical models in current industry distributed simulation applications. Prerequisite: ITP 293 (Modeling and Simulation Protocols). Lecture 4 hours per week.

**Japanese****JPN 15 - 16****Japanese for Business I-II**

2 credits each

Introduces students with little or no prior instruction in the Japanese language to the basic vocabulary and conversation skills needed for various situations in business settings, including cultural mores and customs. Prerequisite: JPN 15 for JPN 16 or previous experience with the language. Lecture 2 hours per week.

**JPN 17 - 18****Japanese for the Tourist I-II**

2 credits each

Introduces spoken Japanese to people intending to travel to a Japanese speaking country. Lecture 2 hours per week.

**Legal Administration  
(Paralegal Studies)****LGL 110****Introduction to Law and the Legal Assistant**

3 credits

Introduces various areas of law in which a legal assistant may be employed. Includes study of court systems (Virginia and federal) as well as a brief overview of criminal law, torts, domestic relations, evidence, ethics, the role of the legal assistant, and other areas of interest. Prerequisite: ENG 3 and ENG 5 or placement scores indicating readiness for ENG 111. Lecture 3 hours per week.

**LGL 115****Real Estate Law for Legal Assistants**

3 credits

Studies law of real property and gives in-depth survey of the more common types of real estate transactions and conveyances such as deeds, contracts, leases, and deeds of trust. Focuses on drafting these various instruments and studies the system of recording and search of public documents. LGL 110 should be taken prior to or with LGL 115. Lecture 3 hours per week.

**LGL 117****Family Law**

3 credits

Studies elements of a valid marriage, grounds for divorce and annulment, separation, defenses, custody, support, adoptions, and applicable tax consequences. Includes property settlement, pre- and ante-nuptial agreements, pleadings, and rules of procedure. May include specific federal and Virginia consumer laws. LGL 110 should be taken prior to or with LGL 117. Lecture 3 hours per week.

**LGL 118****Family Mediation**

3 credits

Explores concepts in the resolution of family disputes, such as a comparison of family mediation with general mediation, custody and visitation, divorce and separation, parenting issues and parenting arrangements, support and property issues, tax consequences of divorce, and ethics of family mediation. Focuses on experiential learning as informed by role-play, demonstration, and critique. Introduces students to the variety of settings in which family mediation processes are utilized, and the ethical and unauthorized practice of law opinions encountered in family mediation practice. Prerequisite: LGL 150. Lecture 3 hours per week.

**LGL 125****Legal Research**

3 credits

Provides an understanding of various components of a law library, and emphasizes research skills through the use of digests, encyclopedias, reporter systems, codes, Shepard's Citations, ALR, and other research tools. May include overview of computer applications and writing projects. Prerequisite: LGL 110. Lecture 3 hours per week.

**LGL 126****Legal Writing**

3 credits

Studies proper preparation of various legal documents, including legal memoranda, letters, and pleadings. Involves practical applications. May include case and appellate briefs. Prerequisites: ENG 111 and LGL 125. Lecture 3 hours per week.

**LGL 130****Law Office Administration and Management**

3 credits

Introduces management principles and systems applicable to law firms, including record keeping, disbursements, escrow accounts, billing, and purchasing. May include accounting methods and software packages applicable to law firms. Lecture 3 hours per week.

**LGL 150****Law and Mediation**

3 credits

Explores concepts, such as conflict resolution, communication and problem solving, as the basis for the exploration of the mediation process. Significant focus is on experiential learning, as informed by initial introduction to the theoretical basis. Students will also be introduced to the variety of settings in which mediation processes are utilized and the utilization of mediation within the Commonwealth of Virginia. Co-requisite: LGL 110. Lecture 3 hours per week.

**LGL 200****Ethics for the Legal Assistant**

1 credit

Examines general principles of ethical conduct applicable to legal assistants. Includes the application of rules of ethics to the practicing legal assistant. LGL 110 should be taken prior to or with LGL 200. Lecture 1 hour per week.

**LGL 210****Virginia and Federal Procedure**

3 credits

Examines the rules of procedure in the Virginia and federal court systems, including the Federal Rules of Civil Procedure and the Rules of Practice and Procedure in the District Court, Circuit Court, Court of Appeals, and Supreme Court of Virginia. Lecture 3 hours per week.

**LGL 215****Torts**

3 credits

Studies fundamental principles of the law of torts. May include preparation and use of pleadings and other documents involved in the trial of a civil action. Emphasizes personal injury, products liability, and malpractice cases. Prerequisite: LGL 110. Lecture 3 hours per week.

**LGL 216****Trial Preparation and Discovery Practice**

3 credits

Examines the trial process, including the preparation of a trial notebook, pretrial motions, and orders. May include preparation of interrogatories, depositions, and other discovery tools used in assembling evidence in preparation for the trial or an administrative hearing. Prerequisite: LGL 110. Lecture 3 hours per week.

**LGL 218****Criminal Law**

3 credits

Focuses on major crimes, including their classification, elements of proof, intent, conspiracy, responsibility, parties, and defenses. Emphasizes Virginia law. May include general principles of applicable constitutional law and criminal procedure. Prerequisite: LGL 110. Lecture 3 hours per week.

**LGL 225****Estate Planning and Probate**

3 credits

Introduces various devices used to plan an estate, including wills, trusts, joint ownership and insurance. Considers various plans in light of family situations and estate objectives. Focuses on practices involving administration of an estate, including taxes and preparation of forms. Prerequisite: LGL 110. Lecture 3 hours per week.

**LGL 226****Real Estate Abstracting**

3 credits

Reviews aspects of abstracting title to real estate, recordation of land transactions, liens, grantor-grantee indices, warranties, covenants, restrictions, and easements. Prerequisite: LGL 115. Lecture 3 hours per week.

**LGL 230****Legal Transactions**

3 credits

Presents an in-depth study of general contract law, including formation, breach, enforcement, and remedies. May include an overview of UCC sales, commercial paper, and collections. LGL 110 should be taken prior to or with LGL 230. Lecture 3 hours per week.

**LGL 234****Intellectual Property Law**

3 credits

Presents outline of federal copyright and federal and state trademark law. Examines the functions of legal assistants in preparing registrations as well as infringement litigation. Covers related areas of law including trade secrecy and differences between various types of intellectual property. Examines the basics of patent law. Prerequisite: LGL 235. Lecture 3 hours per week.

**LGL 235****Legal Aspects of Business Organizations**  
3 credits

Studies fundamental principles of agency law and the formation of business organizations. Includes sole proprietorships, partnerships, corporations, limited liability companies, and other business entities. Reviews preparation of the documents necessary for the organization and operation of businesses. Prerequisite: LGL 110. Lecture 3 hours per week.

**LGL 238****Bankruptcy**  
3 credits

Provides a practical understanding of non-bankruptcy alternatives and the laws of bankruptcy including Chapters 7, 11, 12 and 13 of the Bankruptcy Code. Emphasis will be placed on preparing petitions, schedules, statements and other forms. LGL 110 should be taken prior to or with LGL 238. Lecture 3 hours per week.

## Medical Assisting

**MDA 100****Introduction to Medical Assisting**  
1 credit

Introduces the student to the medical practice environment. Stresses the responsibilities of the humanistic approach in the rendering of health care. Lecture 1 hour per week.

**MDA 101****Medical Assistant Science I**  
4 credits

Provides an in-depth study of medical terminology, anatomy and physiology and pathology for the medical assistant. Focuses on clinical application and decision making in the health care environment. Prerequisite: Instructor permission. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**MDA 102****Medical Assistant Science II**  
2 credits

Prepares students to perform patient care procedures including but not limited to respiratory care procedures, basic nursing arts, equipment maintenance, and patient teaching. Prerequisite: Instructor permission. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**MDA 103****Medical Assistant Science III**  
2 credits

Prepares students to perform clinical assistant skills and emergency care procedures, including basic life support, bandage application, physical assessment of patient, surgical asepsis, and basic diagnostic techniques. Prerequisite: Instructor permission. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**MDA 104****Medical Assistant Science IV**  
3 credits

Prepares students to perform diagnostic tests and assist with physical examinations including basic radiologic procedures, ECG administration, basic pulmonary functions, and allergy testing. Prerequisite: Instructor permission. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**MDA 107****Pharmacology for Medical Assistants**  
2 credits

Focuses on the administration of medications by the medical assistant. Introduces general principles of drug action, pharmacology of the major drug classifications, and drug side effects. Prerequisite: Instructor permission. Lecture 2 hours per week.

**MDA 203****Medical Office Procedures**  
3 credits

Instructs students in the practice of the management of a medical office in areas such as receptionist duties, telephone techniques, appointment scheduling, verbal and written communications, medical and

non-medical record management. Explains library and editorial duties, inventory, care of equipment and supplies, security, office maintenance, management responsibilities, placement, and professional ethics and professionalism. Prerequisite: Instructor permission. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**MDA 207****Medical Law and Ethics**  
2 credits

Instructs students in the legal relationship of the physician, patient, and medical assistant; professional liabilities, Medical Practice Acts, professional attitudes and behavior and the types of medical practice. Also includes a basic history of medicine. Prerequisite: Instructor permission. Lecture 2 hours per week.

**MDA 208****Medical Office Coding**  
2 credits

Introduces students to ICD-9 and CPT-4 classification coding systems used in physician offices, hospitals, and ambulatory care settings. Prerequisite: Instructor permission. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**MDA 209****Medical Office Insurance**  
2 credits

Focuses on various medical insurance policies with in-depth study of health insurance and managed care including capitation versus fee for service in the HMO area. Discusses managed care companies in this area and their requirements. Prerequisite: Instructor permission. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**MDA 210****Medical Office Software Applications**  
1 credit

Instructs students in the use of software in the medical office including billing, scheduling appointments, and patient records. Laboratory 2 hours per week.

**MDA 221  
Diagnostic Laboratory Procedures**

4 credits

Instructs students in the practice of laboratory procedures commonly performed in a physician's office. Includes the use and care of equipment and supplies, the processing of reports and requisitions, terminology, and the safety of patient and student. Includes urinalysis and hematology testing. Prerequisite: Instructor permission. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**Mechanical  
Engineering Technology****MEC 111  
Materials for Industry**

3 credits

Studies the nature, structure, properties, and typical applications of metallic, polymeric, ceramic, and composite materials. Promotes job entry understanding of basic material concepts. Focuses on applications of materials as well as the behavior of materials subjected to external stresses. Addresses as required the earth's limited material resources, energy efficient materials, dependence on foreign sources of materials, material systems, thermal processing, and electronic-related materials. Lecture 3 hours per week.

**MEC 120  
Principles of Machine Technology**

3 credits

Studies fundamental machine operations and practices, including layout, measuring devices, hand tools, drilling, reaming, turning between centers, cutting tapers and threads, and milling; fabrication of mechanical parts on drill press, lathe and mill. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**MEC 126  
Computer Programming for  
Technologists**

3 credits

Includes computer software and programming. Covers programming for the microcomputer using high level languages such as BASIC, FORTRAN, C, or PASCAL. Teaches computer solutions of mathematical problems in applications such as circuit analysis and static equilibrium. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**MEC 131  
Mechanics I - Statics for  
Engineering Technology**

3 credits

Teaches Newton's laws, resultants and equilibrium of force systems, trusses and frames, determination of centroids, and distributed loads and moments of inertia. Introduces dry friction and force systems in space. Prerequisite: MTH 116 or MTH 164. Lecture 3 hours per week.

**MEC 132  
Mechanics II - Strength of Materials for  
Engineering Technology**

3 credits

Teaches the concepts of stress and strain. Provides an analysis of stresses and deformations in loaded members, connectors, shafts, beams, columns, and combined stress. Prerequisite: MTH 116 and MEC 131. Lecture 3 hours per week.

**MEC 268  
Fluid Power - Hydraulic Systems**

3 credits

Studies hydraulic components and their integration into complex systems including system analysis and trouble-shooting. Introduces design considerations necessary for repair and modification. Covers closed loop control and proportional valves with electronic control. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**MEC 269  
Fluid Power - Pneumatic Systems**

3 credits

Teaches pneumatic components, systems and trouble analysis. Introduces basic design for modification and repair. Covers open loop control, fluidics, robotics and computer controls. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Marketing****MKT 100  
Principles of Marketing**

3 credits

Presents principles, methods, and problems involved in marketing to consumers and organizational buyers. Discusses problems and policies connected with distribution and sale of products, pricing, promotion, and buyer motivation. Examines variations of marketing research, legal, social, ethical, e-commerce, and international considerations in marketing. Lecture 3 hours per week.

**MKT 110  
Principles of Selling**

3 credits

Presents a fundamental, skills-based approach to selling and relationship building. Emphasizes learning effective interpersonal communication skills in all areas of the sales process through skill-building activities. Examines entry-level sales careers in retailing, wholesaling, services and industrial selling. Lecture 3 hours per week.

**MKT 160  
Marketing for Small Business**

3 credits

Presents the development of the marketing mix for a small business. Includes areas such as product development, pricing, promotion, salesmanship, customer relations, and consumer behavior. Lecture 3 hours per week.

**MKT 216****Retail Organization and Management**

3 credits

Examines the organization of the retail establishment to accomplish its goals in an effective and efficient manner. Includes study of site location, internal layout, store operations, and security. Examines the retailing mix, the buying or procurement process, pricing, and selling. Studies retail advertising, promotion, and publicity as a coordinated effort to increase store traffic. Lecture 3 hours per week.

**MKT 220****Principles of Advertising**

3 credits

Emphasizes the role of advertising in the marketing of goods, services, and ideas. Discusses the different uses of advertising; types of media; how advertising is created; agency functions; and legal, social, and economic aspects of the industry. Introduces advertising display, copy and art work preparation, printing and selection of media. Lecture 3 hours per week.

**MKT 260****Customer Service Management**

3 credits

Examines the role of customer service in achieving a firm's long-term goals; discusses the basic principles of effective customer service; explores the tasks and responsibilities of a customer service manager. Includes such topics as purpose of customer service; establishment of customer service goals and policies; recruitment, selection and training of customer service employees motivation techniques; empowering employees for better decision making; and evaluation of customer service employees and program. Lecture 3 hours per week.

**MKT 271****Consumer Behavior**

3 credits

Examines the various influences affecting consumer buying behavior before, during, and after product purchases. Describes personal, societal, cultural, environmental, group, and economic determinants on consumer buying. Lecture 3 hours per week.

**MKT 276****International Marketing Management**

3 credits

Presents the process of marketing and management and applies it to the marketing of products within the global marketplace. Introduces the student to activities involving the gathering and analyzing of information in the development and implementation of an international marketing plan. Lecture 3 hours per week.

**MKT 282****Principles of E-Commerce**

3 credits

Studies on-line business strategies, and the hardware and software tools necessary for Internet commerce. Includes the identification of appropriate target segments, the development of product opportunities, pricing structures, distribution channels and execution of marketing strategies. Lecture 3 hours per week.

**Military Science****MSC 111-112****Military Science I-II**

2 credits each

Covers the first year of general military science: organization of the Army and ROTC, U.S. Army and national security, individual weapons, marksmanship, and leadership laboratory. Courses offered only in cooperation with four-year colleges authorized to offer Army ROTC programs. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**MSC 211-212****Military Science III-IV**

2 credits each

Focuses on the second year of general military science: American military history, introduction to operations and basic tactics, map and aerial photo reading, and leadership laboratory. Courses offered only in cooperation with four-year colleges authorized to offer Army ROTC programs. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Mathematics****MTH 1****Developmental Mathematics**

1 credit

Designed to bridge the gap between a weak mathematical foundation and the knowledge necessary for the study of mathematics courses in technical, professional, and transfer programs. Topics may include arithmetic, algebra, geometry, and trigonometry. Lecture 1 hour per week.

**MTH 2****Arithmetic**

4 credits

Covers arithmetic principles and computations including whole numbers, fractions, decimals, percents, measurement, graph interpretation, geometric forms, and applications. Develops the mathematical proficiency necessary for selected curriculum entrance. Credits not applicable toward graduation. Lecture 4 hours per week.

**MTH 3****Algebra I**

5 credits

Covers the topics of Algebra I including real numbers, equations and inequalities, exponents, polynomials, Cartesian coordinate system, rational expressions, and applications. Develops the mathematical proficiency necessary for selected curriculum entrance. Credits not applicable toward graduation. Prerequisites: A placement recommendation for MTH 03 and Arithmetic or equivalent. Lecture 5 hours per week.

**MTH 4****Algebra II**

5 credits

Expands upon the topics of Algebra I including rational expressions, radicals and exponents, quadratic equations, systems of equations, and applications. Develops the mathematical proficiency necessary for selected curriculum entrance. Credits not applicable toward graduation. Prerequisites: A placement recommendation for MTH 04 and Algebra I or equivalent. Lecture 5 hours per week.

**MTH 103-104****Applied Technical Mathematics I-II**

3 credits each

Presents a review of arithmetic, elements of algebra, geometry, and trigonometry.

Directs applications to specialty areas.

Prerequisites: A placement recommendation for MTH 103 and one unit of high school mathematics or equivalent. Lecture 3 hours per week.

**MTH 115-116****Technical Mathematics I-II**

3 credits each

Presents algebra through exponential and logarithmic functions, trigonometry, vectors, analytic geometry, and complex numbers.

Prerequisites: A placement recommendation for MTH 115 and Algebra I and Geometry, or Algebra I and Algebra II, or equivalent.

Lecture 3 hours per week.

**MTH 121****Fundamentals of Mathematics I**

3 credits

Covers concepts of numbers, fundamental operations with numbers, formulas and equations, graphical analysis, binary numbers, Boolean and matrix algebra, linear programming, and elementary concepts of statistics. Prerequisites: A placement recommendation for MTH 121 and one unit of high school mathematics or equivalent. (Intended for occupational/technical programs.) Lecture 3 hours per week.

**MTH 126****Mathematics for Allied Health**

3 credits

Presents scientific notation, precision and accuracy, decimals and percents, ratio and proportion, variation, simple equations, techniques of graphing, use of charts and tables, logarithms, and the metric system.

Prerequisites: A placement recommendation for MTH 126 and one unit of high school mathematics or equivalent. Lecture 3 hours per week.

**MTH 150****Topics in Geometry**

3 credits

Presents the fundamentals of plane and solid geometry and introduces non-Euclidean geometries and current topics. Prerequisites: A placement recommendation for MTH 150 and Algebra I and Geometry or equivalent. Lecture 3 hours per week.

**MTH 152****Mathematics for the Liberal Arts II**

3 credits

Presents topics in functions, combinations, probability, statistics and algebraic systems.

Prerequisites: A placement recommendation for MTH 152 and Algebra I, Algebra II, and Geometry or equivalent. Lecture 3 hours per week.

**MTH 158****College Algebra**

3 credits

Covers the structure of complex number systems, polynomials, rational expressions, graphing, systems of equations and inequalities and functions, quadratic and rational equations and inequalities.

Prerequisites: A placement recommendation for MTH 158 and Algebra I, Algebra II and Geometry or equivalent. Lecture 3 hours per week.

**MTH 163****Precalculus I**

3 credits

Presents college algebra, matrices, and algebraic, exponential, and logarithmic functions. Prerequisites: A placement recommendation for MTH 163 and Algebra I, Algebra II, and Geometry or equivalent. (Credit will not be awarded for both MTH 163 and MTH 166.) Lecture 3 hours per week.

**MTH 164****Precalculus II**

3 credits

Presents trigonometry, analytic geometry, and sequences and series. Prerequisite: MTH 163 or equivalent. (Credit will not be awarded for both MTH 164 and MTH 166.) Lecture 3 hours per week.

**MTH 166****Precalculus with Trigonometry**

5 credits

Presents college algebra, analytic geometry, trigonometry, and algebraic, exponential, and logarithmic functions. Prerequisites: A placement recommendation for MTH 166 and Algebra I, Algebra II, and Geometry or equivalent. (Credit will not be awarded for both MTH 163-164 and MTH 166.) Lecture 5 hours per week.

**MTH 173****Calculus with Analytic Geometry I**

5 credits

Presents analytic geometry and the calculus of algebraic and transcendental functions including the study of limits, derivatives, differentials, and introduction to integration along with their applications. Designed for mathematical, physical, and engineering science programs. Prerequisites: A placement recommendation for MTH 173 and four units of high school mathematics including Algebra I, Algebra II, Geometry, and Trigonometry or equivalent. (Credit will not be awarded for more than one of MTH 173, MTH 175, or MTH 273.) Lecture 5 hours per week.

**MTH 174****Calculus with Analytic Geometry II**

4 credits

Continues the study of analytic geometry and the calculus of algebraic and transcendental functions including rectangular, polar, and parametric graphing, indefinite and definite integrals, methods of integration, and power series along with their applications. Designed for mathematical, physical, and engineering science programs. Prerequisite: MTH 173 or equivalent. (Credit will not be awarded for more than one of MTH 174, MTH 176 or MTH 274.) Lecture 4 hours per week.

**MTH 240  
Statistics****3 credits**

Presents an overview of statistics, including descriptive statistics, elementary probability, probability distributions, estimation, hypothesis testing, and correlation and regression. Prerequisites: A placement recommendation for MTH 240, Algebra I and II or equivalent. (Credit will not be awarded for both MTH 240 and MTH 241.) Lecture 3 hours per week.

**MTH 270  
Applied Calculus****3 credits**

Introduces limits, continuity, differentiation and integration of algebraic and transcendental functions, techniques of integration, and partial differentiation. Prerequisite: MTH 163 or MTH 166 or equivalent. (Credit will not be awarded for both MTH 270 and MTH 271.) Lecture 3 hours per week.

**MTH 277  
Vector Calculus****4 credits**

Presents vector valued functions, partial derivatives, multiple integrals, and topics from the calculus of vectors. Designed for mathematical, physical, and engineering science programs. Prerequisite: MTH 174 or equivalent. Lecture 4 hours per week.

**MTH 279  
Ordinary Differential Equations****4 credits**

Introduces ordinary differential equations. Includes first order differential equations, second and higher order ordinary differential equations with applications. Designed for mathematical, physical, and engineering science programs. Prerequisite: MTH 174 or equivalent. Lecture 4 hours per week.

**Music****MUS 101-102****Basic Musicianship I-II****3 credits each**

Provides exercises leading to knowledge and skill in the rudiments of music. Includes rhythmic notation as well as scales, keys, and intervals along with exercises in sight reading and ear training. Lecture 3 hours per week.

**MUS 111-112****Music Theory I-II****4 credits each**

Discusses elements of musical construction of scales, intervals, triads, and chord progressions. Develops ability to sing at sight and write from dictation. Introduces the analysis of the Bach chorale style. Expands facility with harmonic dictation and enables the student to use these techniques at the keyboard. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**MUS 121-122****Music Appreciation I-II****3 credits each**

Increases the variety and depth of the student's interest, knowledge, and involvement in music and related cultural activities. Acquaints the student with traditional and twentieth century music literature, emphasizing the relationship music has as an art form with man and society. Increases the student's awareness of the composers and performers of all eras through listening and concert experiences. Lecture 3 hours per week.

**MUS 131-132****Class Voice I-II****2 credits each**

Introduces the many aspects of singing from the physical act through the aesthetic experience. The course is designed for the beginning singer who desires vocal improvement, and for the voice major as an addition to and extension of skills and knowledge necessary for artistic development. Introduces appropriate repertoire. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**MUS 136****Applied Music - Voice****2 credits**

Teaches singing, proper breath control, diction, and development of tone. Studies the standard vocal repertoire. Two half-hour lessons per week. 4 hours practice required. Prerequisite: Divisional approval.

**MUS 137****Chorus Ensemble****1 credit**

Ensemble consists of performance from the standard repertoire, including study of ensemble techniques and interpretation. Prerequisite: Divisional approval. May be repeated for credit. Laboratory 3 hours per week.

**MUS 141-142****Class Piano I-II****2 credits each**

Offers the beginning piano student activities in learning musical notation, accomplishing sight reading skills, and in mastering techniques of keyboard playing. Presents appropriate literature. Open to all students and may be used to fulfill applied minor instrument requirement for music major. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**MUS 145****Applied Music - Keyboard****2 credits**

Teaches piano, organ, harpsichord, or synthesizer. Studies the standard repertoire. Two half-hour lessons per week. 4 hours practice required. Prerequisite: Divisional approval.

**MUS 155****Applied Music - Woodwinds****2 credits**

Teaches fundamentals of the woodwind instruments. Studies the standard repertoire. Two half-hour lessons per week. 4 hours practice required. Prerequisite: Divisional approval.

**MUS 159****Improvisational Techniques**

3 credits

Introduces the principles of improvisation using harmonic structures and progressions from the period of common practice.

Includes listening to and performing music of the standard jazz and popular repertoire. Develops performance skills utilizing specific improvisational devices employed in different historical periods. Prerequisite: selected Applied Music or freshman level proficiency. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**MUS 165****Applied Music - Strings**

2 credits

Teaches fundamentals of string instruments, harp or guitar. Studies the standard repertoire. Two half-hour lessons per week. 4 hours practice required. Prerequisite: Divisional approval.

**MUS 175****Applied Music - Brass**

2 credits

Teaches fundamentals of brass instruments. Studies the standard repertoire. Two half-hour lessons per week. 4 hours practice required. Prerequisite: Divisional approval.

**MUS 185****Applied Music - Percussion**

2 credits

Teaches fundamentals of percussion instruments. Studies the standard repertoire. Two half-hour lessons per week. 4 hours practice required. Prerequisite: Divisional approval.

**MUS 211-212****Advanced Music Theory I-II**

4 credits each

Increases facility in the analysis and usage of diatonic and chromatic harmonies. Continues harmonic analysis of Bach style. Includes exercises in sight-singing, ear-training, and keyboard harmony. Prerequisite: MUS 111-112 or equivalent. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**MUS 221-222****History of Music I-II**

3 credits each

Presents the chronology of musical styles from antiquity to the present time. Relates the historical development of music to parallel movements in art, drama, and literature. Develops techniques for listening analytically and critically to music. Lecture 3 hours per week.

**MUS 236****Advanced Applied Music - Voice**

2 credits

Continues MUS 136. Two half-hour lessons per week. 4 hours practice required. Prerequisite: Divisional approval.

**MUS 237****Chorus Ensemble**

1 credit

Continues MUS 137. Laboratory 3 hours per week.

**MUS 245****Advanced Applied Music - Keyboard**

2 credits

Continues MUS 145. Two half-hour lessons per week. 4 hours practice required. Prerequisite: Divisional approval.

**MUS 265****Advanced Applied Music - Strings**

2 credits

Continues MUS 165. Two half-hour lessons per week. 4 hours practice required. Prerequisite: Divisional approval.

**Natural Science****NAS 115****Science in the Workplace**

3 credits

Explores concepts of basic physical sciences as they apply to the workplace. Presents scientific methods, energy, heat, and temperature as related to various materials used in the workplace. Designed for trade workers that work with a variety of materials in many different applications. Assists workers with the physical properties of materials as they relate to various manufacturing methods. Lecture 3 hours per week.

**NAS 120****Introductory Meteorology**

3 credits

Studies cloud formation, weather maps, forecasting, and wind systems with emphasis on local weather patterns. Lecture 3 hours per week.

**NAS 125****Meteorology**

4 credits

Presents a non-technical survey of fundamental meteorology. Focuses on the effects of weather and climate on humans and their activities. Serves for endorsement or recertification of earth science teachers. Lecture 3 hours. Recitation and laboratory 2 hours. Total 5 hours per week.

**NAS 130****Elements of Astronomy**

4 credits

Covers history of astronomy and its recent developments. Stresses the use of astronomical instruments and measuring techniques and includes the study and observation of the solar system, stars, and galaxies. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.

**NAS 131-132****Astronomy I-II**

4 credits each

Studies the major and minor bodies of the solar system, stars and nebulae of the milky way, and extragalactic objects. Examines life

and death of stars, origin of the universe, history of astronomy, and instruments and techniques of observation. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.

**NAS 177**  
**Upper Extremity Anatomy and Kinesiology**  
2 credits

Focuses on the upper extremity anatomy to include the entire shoulder girdle and the impact of pathology and injury related to the skeletal, nervous and muscular systems. Covers planes of movement of the upper extremity associated with basic physics and types of levers. Lecture 2 hours per week.

**NAS 215**  
**Man in His Environment**  
6 credits

Analyzes ecological and technological forces at work in today's world including air and water pollution, pesticides, and land use. Lecture 4 hours per week. Recitation and laboratory 6 hours per week. Total 10 hours per week.

## Nursing

**NUR 27**  
**Nurses Aide I**  
4 credits

Teaches care of older patients with emphasis on the social, emotional, and spiritual needs. Covers procedures; communication and interpersonal relations; observation, charting and reporting; safety and infection control; anatomy and physiology; personal care, nutrition and patient feeding; death and dying. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**NUR 108**  
**Nursing Principles and Concepts**  
6 credits

Introduces principles of nursing, health and wellness concepts, and the nursing process. Identifies nursing strategies to meet the multidimensional needs of individuals. Includes math computational skills, basic

computer instruction related to the delivery of nursing care, introduction to the profession of nursing, nursing process, documentation; basic needs related to integumentary system, teaching/learning, stress, psychosocial, safety, nourishment, elimination, oxygenation, circulation, rest, comfort, sensory, fluid and electrolyte and mobility needs in adult clients. Also includes care of the pre/post operative client. Provides supervised learning experience in college nursing laboratories and/or cooperating agencies. Prerequisite: Admission to the Nursing Program. Lecture 3 hours. Laboratory 9 hours. Total 12 hours per week.

**NUR 115**  
**LPN Transition**  
6 credits

Introduces the role of the registered nurse through concepts and skill development in the discipline of professional nursing. This course serves as a bridge course for licensed practical nurses and is based upon individualized articulation agreements, mobility exams, or other assessment criteria as they relate to local programs and service areas. Includes math computational skills and basic computer instruction related to the delivery of nursing care. Lecture 4 hours. Laboratory 6 hours. Total 10 hours per week.

**NUR 130**  
**Physical Assessment and Basic Pharmacology**  
3 credits

Teaches a systematic approach to performing physical assessment skills and basic pharmacological concepts. Includes basic principles of data collection and basic analysis using skills of interviewing and techniques of inspection, palpation, percussion and auscultation. Principles of pharmacology include dosage calculations, major drug classifications, drug legislation, legal aspects of medication administration, drug action on specific body systems, and basic computer applications. Provides supervised learning experiences in a college laboratory. Lecture 1 hour. Laboratory 6 hours. Total 7 hours per week.

**NUR 170**  
**Essentials of Medical/Surgical Nursing**  
4 credits

Focuses on the care of individuals/families requiring medical or surgical treatment. Uses all components of the nursing process with increasing degrees of skill. Includes mathematical computational skills and basic computer instruction related to the delivery of nursing care. Provides supervised learning experiences in college nursing laboratories and/or cooperating agencies. Prerequisites: NUR 108 and NUR 130. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

**NUR 180**  
**Essentials of Maternal/Newborn Nursing**  
4 credits

Utilizes the concepts of the nursing process in caring for families in the antepartum, intrapartum, and postpartum periods. Includes math computational skills and basic computer instruction related to the delivery of nursing care. Provides supervised learning experiences in college nursing laboratories and/or cooperating agencies. Prerequisites: NUR 108 and NUR 130. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

**NUR 201**  
**Psychiatric Nursing**  
4 credits

Focuses on the care of individuals/families requiring clinical treatment. Uses all components of the nursing process with increasing degrees of skill. Includes math computational skills and basic computer instruction related to the delivery of nursing care, alterations in behavior, eating disorders, mood disorders, anxiety, chemical dependency and dementias. Provides supervised learning experiences in college nursing laboratories and/or cooperating agencies. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

**NUR 255****Nursing Organization and Management**  
3 credits

Addresses management and organizational skills as they relate to nursing. Emphasizes group dynamics, resolution of conflicts, and leadership styles. Prerequisite: NUR 271. Lecture 3 hours per week.

**NUR 270****Essential Nursing Concepts II**  
4 credits

Focuses on complex nursing care of individuals, families and/or groups in various stages of development who are experiencing alterations related to their biopsychosocial needs. Uses all components of the nursing process with increasing degrees of skill. Includes math computation skills, basic computer instruction related to the delivery of nursing care with patients having fluid & electrolyte imbalance related to inflammatory bowel disease, intestinal obstruction, peptic ulcer disease and cirrhosis; altered regulatory hormonal mechanism related to endocrine disorders; altered inflammatory process related to STD/AIDS, endocarditic, rheumatic fever/valvular disorders and pancreatitis. Provides supervised learning in college nursing laboratories and/or cooperating agencies. Prerequisite: NUR 201. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

**NUR 271****Essential Nursing Concepts III**  
4 credits

Focuses on complex nursing care of individuals, families and/or groups in various stages of development who are experiencing alterations related to their biopsychosocial needs. Uses all components of the nursing process with increasing degrees of skill. Includes math computation skills, basic computer instruction related to the delivery of nursing care with patients having altered transport to and from cells related to anemia, hemophilia, hypertension, coronary artery disease, heart failure, cystic fibrosis; abnormal proliferation and maturation of cells related to cancer. Provides supervised learning experience

in college nursing laboratories and/or cooperating agencies. Prerequisite: NUR 270. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

**NUR 272****Essential Nursing Concepts IV**  
4 credits

Focuses on complex nursing care of individuals, families and/or groups with multidimensional needs in a variety of settings. Uses all components of the nursing process with increasing degrees of skill. Includes math computation skills, basic computer instruction related to the delivery of nursing care with patients having altered transport to and from cells related to tuberculosis, chronic obstructive pulmonary disease, croup, congenital heart defects, peripheral vascular disease, brain attack, chest injuries; altered neural regulatory mechanisms related to meningitis, spinal cord injury, spina bifida, myelomeningocele, scoliosis, seizure disorder, Parkinson's disease; altered sensory motor function related to multiple sclerosis. Provides supervised learning experience in college nursing laboratories and/or cooperating agencies. Prerequisite: NUR 271. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

**NUR 273****Essential Nursing Concepts V**  
4 credits

Focuses on complex nursing care of individuals, families and/or groups with multidimensional needs in a variety of settings. Uses all components of the nursing process with increasing degrees of skill. Includes math computation skills, basic computer instruction related to the delivery of nursing care with patients having abnormal proliferation and maturation of cells related to cancer; altered fluid and electrolyte imbalance related to burns, renal failure, nephritic syndrome, glomerulonephritis; multi-system disorders. Provides supervised learning experience in college nursing laboratories and/or cooperating agencies. Prerequisite: NUR 272. Co-requisite: NUR 255. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

**NUR 274****Nursing Civic Responsibility**  
1 credit

Focuses upon critical reflective learning that integrates the core components of the associate degree nurse through community services that enhance civic and social responsibilities. Prerequisite: NUR 271. Co-requisite: NUR 272. Laboratory 3 hours per week.

**Occupational Therapy****OCT 100****Introduction to Occupational Therapy**  
3 credits

Introduces the concepts of occupational therapy as a means of directing a person's participation in tasks selected to develop, maintain or restore skills in daily living. Examines the role of the assistant for each function of occupational therapy, and for various practice settings in relationship to various members of the health care team. Prerequisite: Admission into the Occupational Therapy Program. Lecture 3 hours per week.

**OCT 201****Occupational Therapy with Psychosocial Dysfunction**  
3 credits

Focuses on the theory and application of occupational therapy in the evaluation and treatment of psychosocial dysfunction. Includes a survey of conditions which cause emotional, mental, and social disability, as well as the role of the occupational therapy assistant in the assessment, planning and implementation of treatment programs. Prerequisite: Instructor permission. Lecture 3 hours per week.

**OCT 202**  
**Occupational Therapy with Physical Disabilities**  
 4 credits

Focuses on the theory and application of occupational therapy in the evaluation and treatment of physical dysfunction. Includes a survey of conditions which cause physical disability as well as the role of the occupational therapy assistant in assessment, planning and implementation of treatment programs. Prerequisite: Instructor permission. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**OCT 203**  
**Occupational Therapy with Developmental Disabilities**  
 4 credits

Focuses on the theory and application of occupational therapy in the evaluation and treatment of developmental dysfunction. Includes a survey of conditions which cause developmental disability across the life span, with particular emphasis on children and the elderly. Investigates the role of the occupational therapist in assessment, planning and implementation of treatment programs. Prerequisite: Instructor permission. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**OCT 205**  
**Therapeutic Media**  
 2 credits

Develops proficiency in various crafts used as treatment modalities in occupational therapy. Emphasizes how to analyze, adapt and teach select activities as well as how to equip and maintain a safe working environment. Prerequisite: Instructor permission. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**OCT 206**  
**Dyadic and Group Dynamics**  
 3 credits

Provides theory and activity to develop positive interpersonal relationships and effective communication ability. Includes non-verbal communication, listening, observation, interviewing and documentation. Covers group process and its application to occupational therapy, including types of therapeutic groups, group membership roles, leadership skills and forces which affect group function and decision making. Prerequisite: Instructor permission. Lecture 3 hours per week.

**OCT 207**  
**Therapeutic Skills**  
 4 credits

Presents techniques used in the treatment of a variety of conditions frequently seen across the life span. Emphasizes the activities of self-care, work, and leisure as they relate to the development/resumption of normal social role functioning. Prerequisite: Instructor permission. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**OCT 208**  
**Occupational Therapy Service Management**  
 3 credits

Presents principles and techniques of management appropriate to the occupational therapy assistant. Includes roles and functions of the supervisor and the supervisee, scheduling, billing, quality improvement. Issues relevant to professional practice and patient care will be discussed with similarities and differences between various facilities highlighted. Prerequisite: Instructor permission. Lecture 3 hours per week.

**OCT 210**  
**Assistive Technology in Occupational Therapy**  
 2 credits

Explores the assistive technologies available for persons with physical, sensory and cognitive disabilities. Provides instruction in the process of assessment, selection

adaptation and training of assistive technology to persons with a disability. Presents information on funding and maintenance of devices. Exposes students to technology in clinical practice and equipment companies. Prerequisites: OCT 202 and 203 or instructor permission. Lecture 2 hours per week.

**OCT 220**  
**Occupational Therapy for the Adult**  
 2 credits

Reviews normal changes related to aging and factors contributing to dysfunction. Analyzes intervention strategies for common problems, including wellness programs and home modifications. Reviews relevant legislation, continuum of care and caregiver issues. Prerequisite: Instructor permission. Lecture 2 hours per week.

## Physical Education

**PED 100**  
**Pilates**  
 2 credits

Provides a method of mind-body exercise and physical movement designed to stretch, strengthen, balance the body, and improve posture and core stabilization while increasing body awareness. Lecture 1 hour. Lab 2 hours. Total 3 hours per week.

**PED 101**  
**Fundamentals of Physical Activity I**  
 2 credits

Presents principles underlying the components of physical fitness. Utilizes conditioning activities involving cardiovascular strength and endurance, respiratory efficiency, muscular strength, and flexibility. May include fitness assessment, nutrition and weight control information, and concepts of wellness. Lecture 2 hours per week.

**PED 103  
Aerobic Fitness I****2 credits**

Develops cardiovascular fitness through activities designed to elevate and sustain heart rates appropriate to age and physical condition. Lecture 2 hours per week.

**PED 105  
Aerobic Dance I****2 credits**

Focuses on physical fitness through dance exercises. Emphasizes the development of cardiovascular endurance, muscular endurance, and flexibility. Lecture 2 hours per week.

**PED 109  
Yoga****2 credits**

Focuses on the forms of yoga training emphasizing flexibility. Special emphasis given to cardiovascular endurance. Lecture 2 hours per week.

**PED 111  
Weight Training I****2 credits**

Focuses on muscular strength and endurance training through individualized workout programs. Teaches appropriate use of weight training equipment. Lecture 2 hours per week.

**PED 113  
Lifetime Activities I****2 credits**

Presents lifetime sports and activities. Teaches skills and methods of lifetime sports and activities appropriate to the local season and facilities available. Lecture 2 hours per week.

**PED 117  
Fitness Walking****1 credit**

Teaches content and skills needed to design, implement, and evaluate an individualized program of walking, based upon fitness level. Laboratory 2 hours per week.

**PED 123  
Tennis I****2 credits**

Teaches tennis skills with emphasis on stroke development and strategies for individual and team play. Includes rules, scoring, terminology, and etiquette. Lecture 2 hours per week.

**PED 127  
Cycling****2 credits**

Introduces cycling techniques, equipment selection, care and maintenance, safety, and physical conditioning. Lecture 2 hours per week.

**PED 129  
Self Defense****2 credits**

Examines history, techniques, and movements associated with self-defense. Introduces the skills and methods of self-defense emphasizing mental and physical discipline. Lecture 2 hours per week.

**PED 133-134  
Golf I-II****2 credits each**

Teaches basic skills of golf, rules, etiquette, scoring, terminology, equipment selection and use, and strategy. Lecture 2 hours per week.

**PED 135  
Bowling I****2 credits**

Teaches basic bowling skills and techniques, scoring, rules, etiquette, and terminology. Lecture 2 hours per week.

**PED 137-138  
Martial Arts I-II****2 credits each**

Emphasizes forms, styles, and techniques of body control, physical and mental discipline, and physical fitness. Presents a brief history of development of martial arts theory and practice. Lecture 2 hours per week.

**PED 141-142  
Swimming I-II****2 credits each**

Introduces skills and methods of swimming strokes. Focuses on safety and physical conditioning. Lecture 2 hours per week.

**PED 154  
Volleyball****2 credits**

Introduces volleyball skills, techniques, strategies, rules, and scoring. Lecture 2 hours per week.

**PED 156  
Softball****2 credits**

Emphasizes softball skills, techniques, strategies, and rules. Lecture 2 hours per week.

**PED 181  
Downhill Skiing I****2 credits**

Teaches basic skills of downhill skiing; selection and use of equipment; terminology and safety rules. Includes field experience. Lecture 2 hours per week.

**Philosophy****PHI 101-102  
Introduction to Philosophy I-II****3 credits each**

Introduces a broad spectrum of philosophical problems and perspectives with an emphasis on the systematic questioning of basic assumptions about meaning, knowledge, reality, and values. Lecture 3 hours per week.

**PHI 111  
Logic I****3 credits**

Introduces inductive and deductive reasoning with an emphasis on common errors and fallacies. Lecture 3 hours per week.

**PHI 115**  
**Practical Reasoning**

3 credits

Studies informal logic and language techniques as they relate to reasoning and argument. Provides practice in analyzing arguments and constructing sound arguments. Lecture 3 hours per week.

**PHI 220**  
**Ethics**

3 credits

Provides a systematic study of representative ethical systems. Lecture 3 hours per week.

**PHI 226**  
**Social Ethics**

3 credits

Provides a critical examination of moral problems and studies the application of ethical concepts and principles to decision-making. Topics may include abortion, capital punishment, euthanasia, man and the state, sexuality, war and peace, and selected issues of personal concern. Lecture 3 hours per week.

**PHI 260**  
**Studies in Eastern Thinking**

3 credits

Introduces an in-depth study of the East through a variety of approaches which include music, literature, drama and cinema. Places special emphasis on Chinese and Japanese philosophy and religion, especially Buddhism. Lecture 3 hours per week.

**Photography**

**PHT 101-102**  
**Photography I-II**

3 credits each

Teaches principles of photography and fundamental camera techniques. Requires outside shooting and laboratory work. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

**PHT 110**  
**History of Photography**

3 credits

Surveys important photographers, processes, and historical influences of the nineteenth and twentieth centuries. Lecture 3 hours per week.

**PHT 135**  
**Electronic Darkroom**

3 credits

Teaches students to create and manipulate digital photographs. Covers masking, color corrections, and merging of illustrations with photographs. Examines the ethical and property-rights issues which are raised in the manipulation of images. Prerequisite: PHT 101 or equivalent. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

**PHT 201**  
**Advanced Photography I**

3 credits

Provides weekly critiques of students' work. Centers on specific problems found in critiques. Includes working procedures and critical skills in looking at photographs. Prerequisite: PHT 102 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**PHT 205**  
**Zone System in Photography**

3 credits

An advanced course designed for users of all photographic formats. Teaches control of image quality through calibration and testing of film, exposure, and development and negative printing. Teaches creative "pre-visualization" techniques. Prerequisite: PHT 102 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**PHT 221-222**  
**Studio Lighting I-II**

3 credits each

Examines advanced lighting and camera techniques under controlled studio conditions. Includes view camera use, electronic flash, advanced lighting techniques, color temperature and filtration, and lighting ratios. Requires outside shooting. Prerequisite: PHT 102 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**PHT 231-232**  
**Photojournalism I-II**

3 credits each

Introduces equipment, techniques, skills, and concepts of photojournalism. Teaches photography for features, spot news, and photo essays. Emphasizes editing, captioning, and layout. May require individual projects. Prerequisite PHT 102 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**PHT 247**  
**Alternative Photographic Processes**

3 credits

Explores manipulated imagery including traditional and non-traditional processes such as non-silver and electronic imaging. Uses enlarged film negatives in order to investigate a variety of methods. Prerequisite: PHT 102 or equivalent. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

**Physics**

**PHY 100**  
**Elements of Physics**

4 credits

Covers basic concepts of physics, including Newtonian mechanics, properties of matter, heat and sound, fundamental behavior of gases, ionizing radiation, and fundamentals of electricity. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**PHY 130****Survey of Applied Physics**

3 credits

Surveys topics such as heat, electricity, and light with emphasis on practical applications. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**PHY 201-202****General College Physics I-II**

4 credits each

Teaches fundamental principles of physics. Covers mechanics, thermodynamics, wave phenomena, electricity and magnetism, and selected topics in modern physics. Prerequisite: MTH 163 or equivalent. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**PHY 241-242****University Physics I-II**

4 credits each

Teaches principles of classical and modern physics. Includes mechanics, wave phenomena, heat, electricity, magnetism, relativity, and nuclear physics. Prerequisite for PHY 241: MTH 173 or MTH 273 or divisional approval. Prerequisite for PHY 242: MTH 174 or divisional approval. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**Political Science****PLS 130****Basics of American Politics**

3 credits

Teaches basics of the operations of Congress, the presidency, and the federal court system. Includes civil liberties, citizenship, elections, political parties, and interest groups. Lecture 3 hours per week.

**PLS 211-212****U.S. Government I-II**

3 credits each

Teaches structure, operation, and process of national, state, and local governments. Includes in-depth study of the three branches of the government and of public policy. Lecture 3 hours per week.

**PLS 241****International Relations I**

3 credits

Teaches geographic, demographic, economic, ideological, and other factors conditioning the policies of countries and discusses conflicts and their adjustment. Lecture 3 hours per week.

**PLS 242****International Relations II**

3 credits

Teaches foreign policies of the major powers in the world community with an emphasis on the role of the United States in international politics. Lecture 3 hours per week.

**Polysomnographic Technology****PSG 101****Polysomnography I**

4 credits

Surveys the dynamics of normal and abnormal human sleep and the practice of sleep diagnosis and treatment. Studies methods of acquisition, diagnosis, and treatment of sleep disorders. Includes the practice in the use of polysomnographic equipment. Familiarizes students with medical terminology, instrumentation setup and calibration, recording and monitoring techniques, documentation, professional issues, and patient-technologist interactions related to polysomnographic technology. Lecture 3 hours per week.

**PSG 103****Polysomnography Record Evaluation**

3 credits

Presents the general principles of analyzing and scoring polysomnographic records. Studies sleep staging, recognition and analysis of various abnormal respiratory and neurophysiologic events, and recognition and elimination of artifact. Includes scoring and analyzing raw data for the purpose of generating full reports. Lecture 3 hours per week.

**PSG 164****Polysomnography Clinical Procedures I**

4 credits

Offers a practicum in a functioning Sleep Disorders Center. Provides practice in patient set-up, machine calibrations, equipment usage, Nocturnal Polysomnographs, BiPAP and CPAP Titration Trials, and patient education under the supervision of Polysomnographic Technicians. Co-requisite: PSG 103. Clinicals 16 hours per week.

**Psychology****PSY 105****Psychology of Personal Adjustment**

3 credits

Introduces psychological principles that contribute to well-adjusted personality. Considers the effects of stress and coping with the problems of everyday life. Lecture 3 hours per week.

**PSY 116****Psychology of Death and Dying**

3 credits

Focuses on psychological aspects of death and dying. Teaches the meaning of death and ways of handling its personal and social implications. Includes psychological, sociological, cultural, and religious views of death. Lecture 3 hours per week.

**PSY 125****Interpersonal Relationships**

3 credits

Studies individual behavior as it affects the individual's relationships. Considers such topics as attitudes, needs, values, leadership, communication, and group dynamics. Teaches constructive methods of interpersonal problem solving. Lecture 3 hours per week.

**PSY 126**  
**Psychology for Business and Industry**  
3 credits

Focuses on the application of psychology to interpersonal relations and the working environment. Includes topics such as group dynamics, motivation, employee-employer relationships, interpersonal communications and techniques for selection and supervision of personnel. Lecture 3 hours per week.

**PSY 165**  
**Psychology of Human Sexuality**  
3 credits

Focuses on scientific investigation of human sexuality and psychological and social implications of such research. Considers socio-cultural influences, the physiology and psychology of sexual response patterns, sexual dysfunctions, and development of relationships. Lecture 3 hours per week.

**PSY 166**  
**Psychology of Marriage**  
3 credits

Analyzes personality interactions in marriage and other intimate relationships. Examines theories of personal development and types of relationships resulting from interactions. Lecture 3 hours per week.

**PSY 200**  
**Principles of Psychology**  
3 credits

Surveys the basic concepts of psychology. Covers the scientific study of behavior, behavioral research methods and analysis, and theoretical interpretations. Includes topics that cover physiological mechanisms, sensation/perception, motivation, learning, personality, psychopathology, therapy, and social psychology. Lecture 3 hours per week.

**PSY 201-202**  
**Introduction to Psychology I-II**  
3 credits each

Examines human and animal behavior, relating experimental studies to practical problems. Includes topics such as sensation/perception, learning, memory, motivation, emotion, stress, development, intelligence, personality, psychopathology, therapy, and social psychology. Lecture 3 hours per week.

**PSY 215**  
**Abnormal Psychology**  
3 credits

Explores historical views and current perspectives of abnormal behavior. Emphasizes major diagnostic categories and criteria, individual and social factors of maladaptive behavior, and types of therapy. Includes methods of clinical assessment and research strategies. Prerequisites: PSY 200, 201, or 202. Lecture 3 hours per week.

**PSY 216**  
**Social Psychology**  
3 credits

Examines individuals in social contexts, their social roles, group processes and inter-group relations. Includes topics such as small group behavior, social behavior, social cognition, conformity, attitudes, and motivation. Prerequisites: PSY 200, 201, or 202. Lecture 3 hours per week.

**PSY 219**  
**Cross-Cultural Psychology**  
3 credits

Investigates psychological principles from a cross-cultural perspective. Examines cultural basics for views of reality. Describes topics such as time, space, values, sex-roles, and human development in relation to culture. Prerequisites: PSY 200, 201, or 202. Lecture 3 hours per week.

**PSY 220**  
**Introduction to Behavior Modification**  
3 credits

Studies the history of behaviorism and the principles and applications of behavior modification. Emphasizes observation and application of behavior modification principles. Lecture 3 hours per week.

**PSY 230**  
**Developmental Psychology**  
3 credits

Studies the development of the individual from conception to death. Follows a life-span perspective on the development of the person's physical, cognitive, and psychosocial growth. Lecture 3 hours per week.

**PSY 231-232**  
**Life Span Human Development I-II**  
3 credits each

Investigates human behavior through the life cycle. Describes physical, cognitive, and psycho-social aspects of human development from conception to death. Lecture 3 hours per week.

**PSY 235**  
**Child Psychology**  
3 credits

Studies development of the child from conception to adolescence. Investigates physical, intellectual, social and emotional factors involved in the child's growth. Lecture 3 hours per week.

**PSY 236**  
**Adolescent Psychology**  
3 credits

Studies development of the adolescent. Investigates physical, intellectual, social, and emotional factors of the individual from late childhood to early adulthood. Lecture 3 hours per week.

**PSY 255**  
**Psychological Aspects of Criminal Behavior**  
3 credits

Studies psychology of criminal behavior. Includes topics such as violent and non-violent crime, sexual offenses, insanity, addiction, white collar crime, and other deviant behaviors. Provides a background for law enforcement occupations. Prerequisites: PSY 125, 200, 201, or 202 or divisional approval. Lecture 3 hours per week.

**PSY 265**  
**Psychology of Men and Women**  
3 credits

Examines the major determinants of sex differences. Emphasizes psychosexual differentiation and gender identity from theoretical, biological, interpersonal, and socio-cultural perspectives. Includes topics such as sex roles, socialization, rape, abuse, and androgyny. Prerequisites: PSY 125, 200, 201, or 202. Lecture 3 hours per week.

## Physical Therapy Assistant

### PTH 105

#### Introduction to Physical Therapist Assisting

3 credits

Introduces the physical therapist assistant student to the field of physical therapy practice and develops basic patient care skills for application in the initial physical therapy clinical experience. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

### PTH 110

#### Medical Reporting

1 credit

Emphasizes the principles of medical reporting, including the ability to abstract pertinent information from actual medical records. Includes the writing of patient progress notes in standardized formats and medical terminology. Lecture 1 hour per week.

### PTH 115

#### Kinesiology for the Physical Therapist Assistant

4 credits

Focuses on the relationship of specific joint structure and function, the role of individual muscles and groups of muscles and neurological principles in both normal and pathological movement. The course includes a review of basic physics and biomechanical principles applied to human movement. Includes specific posture and gait analysis. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

### PTH 121-122

#### Therapeutic Procedures I-II

5 credits each

Prepares the students to properly and safely administer basic physical therapy procedures utilized by physical therapist assistants. The procedures include therapeutic modalities. Procedures may include therapeutic exercise, electrotherapy and cardiopulmonary rehabilitation. Lecture 3 hours. Laboratory 6 hours. Total 9 hours per week.

### PTH 131

#### Clinical Education

2 credits

Provides supervised instruction in the delivery of physical therapy in one of various clinical settings. Emphasizes the practice of all therapeutic skills learned in the first year, including direct patient care skills and all forms of communication. Laboratory 8 hours per week.

### PTH 151

#### Musculoskeletal Structure and Function

5 credits

Studies the human musculoskeletal system. Covers terms of position and movement, location, and identification of specific bony landmarks, joint structure and design, ligaments, muscle origin, action and innervation, and emphasizes types of contraction. Lecture 3 hours. Laboratory 4 hours. Total 7 hours per week.

### PTH 210

#### Psychological Aspects of Therapy

2 credits

Focuses on the psychological reactions and sociological impact of illness and injury in clients and their families, and among health caregivers who work with them. Examines individual self-identity and the nature of changing client/therapist relationships across the life span. Lecture 2 hours per week.

### PTH 225

#### Rehabilitation Procedures

5 credits

Focuses on treatment techniques typical of long term rehabilitation, e.g., the rehabilitation of congenital, neurological, and disfigurement associated with chronic injury and disease. Lecture 3 hours. Laboratory 4 hours. Total 7 hours per week.

### PTH 226

#### Therapeutic Exercise

4 credits

Emphasizes the basic principles underlying different approaches to exercise including rationale for treatment and may include neurological treatments such as simple facilitation and inhibitory techniques and the teaching of home programs. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

### PTH 251-252

#### Clinical Practicum I-II

3 credits and 4 credits

Provides instruction in local health care facilities in the actual administration of physical therapy treatments under the supervision of licensed physical therapists. Provides experience in a variety of clinical settings. Laboratory 15-20 hours per week.

### PTH 255

#### Seminar in Physical Therapy

2 credits

Includes preparation for licensing examination, specialized lectures, and preparation of a student project. Lecture 2 hours per week.

## Radiography

### RAD 115

#### Principles of Magnetic Resonance Imaging

3 credits

Presents concepts of Magnetic Resonance Imaging and Physics. Teaches fundamentals of Magnetic Resonance and application of principles. Prerequisite: ARRT or eligible. Lecture 3 hours per week.

**RAD 121****Radiographic Procedures I**

4 credits

Introduces procedures for positioning the patient's anatomical structures relative to X-ray beams and image receptors. Emphasizes procedures for routine examination of the chest, abdomen, extremities, and axial skeleton. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**RAD 131-132****Elementary Clinical Procedures I-II**

3 credits each

Develops advanced technical skills in fundamental radiographic procedures. Focuses on manipulation of equipment, patient care, osseous studies, skull procedures, and contrast studies. Provides clinical experience in cooperating health agencies. Clinical 15 hours per week.

**RAD 141-142****Principles of Radiographic Quality I-II**

4 credits each

Presents all factors that control and influence radiographic quality as well as various technical conversion factors useful in radiography. Discusses automatic film processing, sensitometry, and quality assurance testing. Prerequisite: Instructor permission. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**RAD 205****Radiation Protection and Radiobiology**

3 credits

Studies methods and devices used for protection from ionizing radiation. Teaches theories of biological effects, cell organism sensitivity, and the somatic and genetic effects of ionizing radiation. Presents current radiation protection philosophy for protecting the patient and the technologist. Lecture 3 hours per week.

**RAD 206****Human Disease and Radiography**

2 credits

Introduces the various diseases and anomalies that may be manifested on the radiograph. Presents diseases related to the various body systems. Places emphasis on the relationship of the disease process and radiographic density. Lecture 2 hours per week.

**RAD 221****Radiographic Procedures II**

4 credits

Continues procedures for positioning the patient's anatomical structures relative to X-ray beams and image receptors. Emphasizes procedures for routine examination of the skull, contrast studies of internal organs, and special procedures employed in the more complicated investigation of the human body. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**RAD 231-232****Advanced Clinical Procedures I-II**

5 credits each

Reinforces technical skills in fundamental radiographic procedures. Introduces more intricate contrast media procedures. Focuses on technical proficiency, application of radiation, protection, nursing skills, and exposure principles. Teaches advanced technical procedures and principles of imaging modalities, correlating previous radiographic theory, focusing on full responsibility for patients in technical areas, perfecting technical skills, and developing awareness of related areas utilizing ionizing radiation. Provides clinical experience in cooperating health agencies. Clinical 25 hours per week.

**RAD 233****Anatomy and Positioning of the Breast**

1 credit

Presents the risk factors for breast disease, anatomy and physiology of the breast and discusses the various pathologies identified through mammography. Includes routine and special projections of the breast. Prerequisite: ARRT or eligible. Lecture 1 hour per week.

**RAD 234****Breast Imaging/Instrumentation**

1 credit

Discusses the dedicated radiography equipment necessary for breast imaging. Includes proper technical factors, radiation protection techniques, and proper accessory equipment. Prerequisite: ARRT or eligible. Lecture 1 hour per week.

**RAD 235****Quality Assurance in Mammography**

1 credit

Discusses the components of quality assurance in mammography and the accreditation programs developed to ensure quality in breast imaging facilities. Prerequisite: ARRT or eligible. Lecture 1 hour per week.

**RAD 242****Computed Tomography****Procedures and Instrumentation**

2 credits

Focuses on the patient care, imaging procedure and physics and instrumentation related to computed tomography imaging. Prerequisite: ARRT or eligible. Lecture 2 hours per week.

**RAD 244****Case Studies in CT  
(Computed Tomography)**

1 credit

Presents case studies in computed tomography. Focuses on both abnormal and normal studies. Prerequisite: ARRT or eligible. Lecture 1 hour per week.

**RAD 245****Radiologic Specialties**

1 credit

Introduces the study of the treatment of disease as it relates to various imaging modalities, computerized tomography, and magnetic resonance imaging. Introduces computers and other innovations in radiology. Emphasizes theory, principle of operation, and clinical application of these topics. Lecture 1 hour per week.

**RAD 255****Radiographic Equipment**

3 credits

Studies principles and operation of general and specialized X-ray equipment. Lecture 3 hours per week.

**RAD 280****Terminal Competencies in Radiography**

1 credit

Includes preparation and ensures that students possess competencies which relate to materials covered by the ARRT Content Specifications for national exam eligibility. Incorporates activities designed to verify that students have mastered skills in the critical content areas to include equipment operation and maintenance, image production and evaluation, radiographic procedures, radiation protection and patient care. Prerequisite: Instructor permission. Laboratory 3 hours per week.

**Real Estate****REA 100****Principles of Real Estate**

4 credits

Examines practical applications of real estate principles. Includes a study of titles, estates, land descriptions, contracts, legal instruments and concepts, real estate mathematics, financing, agency, appraisal, fair housing, and management of real estate. Lecture 4 hours per week.

**REA 110****Real Estate Sales**

3 credits

Focuses on the fundamentals of sales principles as they apply to real estate. Includes prospects, motives, needs, abilities to buy real estate. Lecture 3 hours per week.

**Religion****REL 100****Introduction to the Study of Religion**

3 credits

Explores various religious perspectives and ways of thinking about religious themes and religious experience. Lecture 3 hours per week.

**REL 200****Survey of the Old Testament**

3 credits

Surveys books of the Old Testament, with emphasis on prophetic historical books. Examines the historical and geographical setting and place of the Israelites in the ancient Middle East as background of the writings. Lecture 3 hours per week.

**REL 210****Survey of the New Testament**

3 credits

Surveys books of the New Testament, with special attention upon placing the writings within their historical and geographical setting. Lecture 3 hours per week.

**REL 215****New Testament and Early Christianity**

3 credits

Surveys the history, literature, and theology of early Christianity in the light of the New Testament. Lecture 3 hours per week.

**REL 216****Life and Teachings of Jesus**

3 credits

Studies the major themes in the teachings of Jesus of Nazareth as recorded in the Gospels, and examines the events of his life in light of modern biblical and historical scholarship. Lecture 3 hours per week.

**REL 217****Life and Letters of Paul**

3 credits

Studies the journeys and religious thought of the apostle Paul. Lecture 3 hours per week.

**REL 230****Religions of the World**

3 credits

Introduces the religions of the world with attention to origin, history, and doctrine. Lecture 3 hours per week.

**REL 247****History of Christianity**

3 credits

Surveys the development of Christianity from its origins to the present. Lecture 3 hours per week.

**REL 255****Selected Problems and Issues in Religion**

3 credits

Examines selected problems and issues of current interest in religion. May be repeated for credit. Lecture 3 hours per week.

**Respiratory Therapy****RTH 102****Integrated Sciences for Respiratory Care II**

3 credits

Integrates the concepts of mathematics, chemistry, physics, microbiology, and computer technology as these sciences apply to the practice of respiratory care. Prerequisite: MTH 3 and Instructor permission. Lecture 3 hours per week.

**RTH 120****Fundamental Theory for Respiratory Care**

2 credits

Presents the theory of basic patient assessment and functional medical terminology. Prerequisite: Instructor permission. Lecture 2 hours per week.

**RTH 121  
Cardiopulmonary Science I****3 credits**

Focuses on pathophysiology, assessment, treatment, and evaluation of patients with cardiopulmonary disease. Explores cardiopulmonary, renal and neuromuscular physiology and pathophysiology. Prerequisite: Instructor permission. Lecture 3 hours per week.

**RTH 131-132  
Respiratory Care Theory  
and Procedures I-II****4 credits each**

Presents theory of equipment and procedures and related concepts used for patients requiring general, acute, and critical cardiopulmonary care. Prerequisite: Instructor permission. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**RTH 145  
Pharmacology for Respiratory Care I****1 credit**

Presents selection criteria for the use of and detailed information on pharmacologic agents used in pulmonary care. Prerequisite: Instructor permission. Lecture 1 hour per week.

**RTH 217  
Pulmonary Rehabilitation, Home Care  
and Health Promotion****2 credits**

Focuses on purpose and implementation of a comprehensive pulmonary rehabilitation program. Explores procedures and approaches used in pulmonary home care. Identifies and discusses major health and wellness programs applied to cardiopulmonary patients. Prerequisite: Instructor permission. Lecture 2 hours per week.

**RTH 222  
Cardiopulmonary Science II****3 credits**

Focuses on assessment, treatment, and evaluation of patients with cardiopulmonary disease. Explores cardiopulmonary, renal and neuromuscular physiology, and pathophysiology. Lecture 3 hours per week.

**RTH 225  
Neonatal and Pediatric  
Respiratory Procedures****3 credits**

Focuses on the cardiopulmonary physiology, pathology and application of therapeutic procedures in the management of the newborn and pediatric patient. Prerequisite: Instructor permission. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**RTH 235  
Diagnostic and Therapeutic Procedures  
II****3 credits**

Presents the use of multiple diagnostic and therapeutic techniques used in ambulatory and critical care patients. Prerequisite: Instructor permission. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**RTH 236  
Critical Care Monitoring****3 credits**

Focuses on techniques and theory necessary for the evaluation and treatment of the critical care patient, especially arterial blood gases and hemodynamic measurements. Explores physiologic effects of advanced mechanical ventilation. Prerequisite: Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Russian****RUS 101-102  
Beginning Russian I-II****4 credits each**

Develops the understanding, speaking, reading, and writing of Russian, and emphasizes the structure of the language. Lecture 4 hours per week. May include one additional hour of oral practice per week.

**Safety****SAF 120  
Safety and Health Standards:  
Regulations and Codes****3 credits**

Teaches development of safety standards, the Occupational Safety and Health Act (OSHA), its rules and regulations; penalties for non-compliance, and methods of compliance. Includes an examination of Government Regulatory Codes and appraisal of consensus, advisory, and proprietary standards. Lecture 3 hours per week.

**SAF 125  
Computer Applications for Technicians****4 credits**

Introduces the use of the personal computer with emphasis on technical software applications for occupational/technical professionals. Lecture 4 hours per week.

**SAF 126  
Principles of Industrial Safety****3 credits**

Teaches principles and practices of accident prevention, analysis of accident causes, mechanical safeguards, fire prevention, housekeeping, occupational diseases, first aid, safety organization, protection equipment and general safety principles and promotion. Lecture 3 hours per week.

**SAF 127  
Industrial Safety****2 credits**

Provides basic understanding of safety and health in an industrial situation. Includes hazardous materials, substances, conditions, activities and habits as well as the prescribed methods and equipment needed for the apprentice to protect himself/herself and others. Lecture 2 hours per week.

**SAF 135****Safety Program Organization and Administration**

3 credits

Introduces techniques of organizing and administering practical safety programs. Emphasizes safety as a management function. Includes an examination of history, occupational safety and health regulations, and a survey of current laws, codes and standards. Lecture 3 hours per week.

**SAF 140****Introduction to Industrial Hygiene**

3 credits

Studies environmental energy, physical and chemical hazards, including gases, vapors, dusts, fumes, and mists; the importance of personal protective equipment, and contamination control methodology. Lecture 3 hours per week.

**SAF 205****Human Factors and Safety Psychology**

3 credits

Studies stresses on the human system, both physiological and psychological, that contribute to the severity of industrial accidents. Includes the interrelationship of industrial medicine and industrial hygiene and a study of the various occupational illnesses. Lecture 3 hours per week.

**SAF 246****Hazardous Chemicals, Materials, and Waste in the Workplace**

3 credits

Introduces the rules and regulations governing use, exposure to, and disposal of hazardous chemicals, materials and waste by-products. Discusses OSHA "Right to Know Laws," EPA and RCRA regulations. Provides the techniques to interpret and understand the code of Federal Regulations. Emphasizes management mandates, strategies, and options to comply with these regulations. Lecture 3 hours per week.

**Student Development****SDV 100****College Success Skills**

1 credit

Assists students in transition to college. Provides over-views of college policies, procedures, and curricular offerings. Encourages contacts with other students and staff. Assists students toward college success through information regarding effective study habits, career and academic planning, and other college resources available to students. May include English and Math placement testing. Strongly recommended for beginning students. Required for graduation. Lecture 1 hour per week.

**SDV 101****Orientation to (Specific Disciplines)**

1 credit

Introduces students to the skills which are necessary to achieve their academic goals, to the services offered at the college, and to the discipline in which they are enrolled. Covers topics such as services offered at the college, including the learning resources center; counseling and advising; listening, test taking, and study skills; and topical areas which are applicable to their particular discipline. Lecture 1 hour per week.

**SDV 104****Study Skills**

2 credits

Assists students in planning strategies to overcome nonproductive study habits and in implementing positive study behaviors. Includes management, memory improvement, note taking, and test taking. Lecture 2 hours per week.

**SDV 105****Personal Development From a Woman's Perspective**

1 credit

Addresses the psychological and educational adjustment needs of the female college student. Covers three segments: personal development, career education, and study skills. Emphasizes the special needs of the re-entry woman. Provides education and support for the individual. Lecture 1 hour per week.

**SDV 106****Preparation for Employment**

1 credit

Provides experience in resume writing, preparation of applications, letters of application, and successfully preparing for and completing the job interview. Assists students in identifying their marketable skills and aptitudes. Develops strategies for successful employment search. Assists students in understanding effective human relations techniques and communication skills in job search. May be substituted for SDV 100. Lecture 1 hour per week.

**SDV 107****Career Education**

1 credit

Surveys career options available to students. Stresses career development and assists in the understanding of self in the world of work. Assists students in applying decision-making to career choice. Lecture 1 hour per week.

**SDV 108****College Survival Skills**

3 credits

Provides an orientation to the college. Introduces study skills, career and life planning. Offers an opportunity to engage in activities aimed at self-discovery. Emphasizes development of "coping skills" such as listening, interpersonal relations, competence, and improved self-concept. Recommended for students enrolled in developmental courses. Lecture 3 hours per week.

## Sociology

### SOC 201-202

#### Introduction to Sociology I-II

3 credits each

Introduces basic concepts and methods of sociology. Presents significant research and theory in areas such as socialization, group dynamics, gender roles, minority group relations, stratification, deviance, culture, community studies. Includes population, social change, and social institutions (family, education, religion, political system, economic system). Lecture 3 hours per week.

### SOC 211-212

#### Principles of Anthropology I-II

3 credits each

Inquires into the origins, development, and diversification of human biology and human cultures. Includes fossil records, physical origins of human development, human population genetics, linguistics, cultures' origins and variation, and historical and contemporary analysis of human societies. Lecture 3 hours per week.

### SOC 215

#### Sociology of the Family

3 credits

Studies topics such as marriage and family in social and cultural context. Addresses the single scene, dating and marriage styles, child-rearing, husband and wife interaction, single parent families, alternative lifestyles. Lecture 3 hours per week.

### SOC 246

#### Death and Society

3 credits

Analyzes death and its relationship to social behavior and social institutions. Focuses attention on types of death, bereavement, funerals, estate planning/inheritance, and the student's own responses to these issues. Lecture 3 hours per week.

### SOC 266

#### Minority Group Relations

3 credits

Investigates minorities such as racial and ethnic groups. Addresses social and economic conditions promoting prejudice, racism, discrimination, and segregation. Lecture 3 hours per week.

### SOC 268

#### Social Problems

3 credits

Applies sociological concepts and methods to analysis of current social problems. Includes delinquency and crime, mental illness, drug addiction, alcoholism, sexual behavior, population crisis, race relations, family and community disorganization, poverty, automation, wars, and disarmament. Lecture 3 hours per week.

## Spanish

### SPA 16

#### Spanish For Business

2 credits

Introduces the student to Spanish used in business transactions. Lecture 2 hours per week.

### SPA 101-102

#### Beginning Spanish I-II

4 credits each

Introduces understanding, speaking, reading, and writing skills and emphasizes basic Spanish sentence structure. May include an additional hour of oral drill and practice per week. Lecture 4 hours per week.

### SPA 150

#### Spanish for Law Enforcement

3 credits

Introduces Spanish to those in the criminal justice field. Emphasizes oral communication and practical first-hand police and justice vocabulary. May include oral drill and practice. Lecture 3 hours per week.

### SPA 160

#### Spanish for the Green Industry I

3 credits

Introduces basic conversation skills in Spanish to those working in the "Green" industry. Emphasizes the use of vocabulary and expressions needed for communication in horticulture, landscaping, nursery/greenhouse, and turf management. Addresses cultural aspects of working with Spanish speaking populations. Lecture 3 hours per week.

### SPA 163

#### Spanish for Health Professionals I

3 credits

Introduces Spanish to those in the health sciences. Emphasizes oral communication and practical medical vocabulary. May include oral drill and practice. Lecture 3 hours per week.

### SPA 203-204

#### Intermediate Spanish I-II

3 credits each

Continues to develop understanding, speaking, reading, and writing skills. Classes conducted in Spanish. Prerequisite: SPA 102 or equivalent. May include oral drill and practice. Lecture 3 hours per week.

## Speech And Drama

### SPD 100

#### Principles of Public Speaking

3 credits

Applies theory and principles of public address with emphasis on preparation and delivery. Lecture 3 hours per week.

### SPD 105

#### Oral Communication

3 credits

Studies effective communication with emphasis on speaking and listening. Lecture 3 hours per week.

**SPD 110****Introduction to Speech Communication**

3 credits

Examines the elements affecting speech communication at the individual, small group, and public communication levels with emphasis on practice of communication at each level. Lecture 3 hours per week.

**SPD 111****Voice and Diction I**

3 credits

Enables students to improve pronunciation, articulation, and voice quality. Includes applied phonetics. Lecture 3 hours per week.

**SPD 126****Interpersonal Communication**

3 credits

Teaches interpersonal communication skills for both daily living and the world of work. Includes perception, self-concept, self-disclosure, listening and feedback, nonverbal communication, attitudes, assertiveness, and other interpersonal skills. Lecture 3 hours per week.

**SPD 131-132****Acting I-II**

3 credits each

Develops personal resources and explores performance skills through such activities as theatre games, role playing, improvisation, work on basic script units, and performance of scenes. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**SPD 136****Theatre Workshop**

3 credits

Enables students to work in various activities of play production. Requires participation in performance, set design, stage carpentry, sound, costuming, lighting, stage managing, props, promotion, or stage crew. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**SPD 141-142****Theatre Appreciation I-II**

3 credits each

Aims to increase knowledge and enjoyment of theatre. Considers process, style, organization, written drama, and performed drama. Lecture 3 hours per week.

**SPD 151-152****Film Appreciation I-II**

3 credits each

Aims to increase the student's knowledge and enjoyment of film and film criticism through discussion and viewing of movies. Lecture 3 hours per week.

**SPD 229****Intercultural Communication**

3 credits

Emphasizes the influence of culture on the communication process including differences in values, message systems, and communication rules. Lecture 3 hours per week.

**SPD 233-234****Rehearsal and Performance I-II**

3 credits each

Explores various aspects of the theatre through involvement in college theatre production. Lecture 3 hours per week.

**SPD 241-242****Introduction to Directing I-II**

3 credits each

Introduces theory and practice of stage direction through the study of directing methods as well as the execution and discussion of directing exercises.

Prerequisites: SPD 131-132 or divisional approval. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**SPD 251****Stage Lighting and Sound**

3 credits

Provides students with a basic understanding of the principles of stage lighting and sound. Instructs students in the fundamentals of stage lighting such as: functions of lighting, qualities of light, design, basic electricity, lighting instruments and equipment, board operation, and safety. Instructs students in

the functions of sound, equipment, design, and sound operation. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**SPD 266****Outdoor Drama**

3 credits

Enables students to study production techniques through participation as actors or technicians in outdoor drama. Prerequisite: divisional approval. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Trucking****TRK 101****DOT Safety Rules and Regulations**

2 credits

Includes an intensive study of the Department of Transportation and state and local laws and regulations governing the motor carrier industry as applied to the professional operation of commercial vehicles. Co-requisites TRK 102 and 103. Lecture 2 hours per week.

**TRK 102****Preventive Maintenance for Truck Drivers**

1 credit

Focuses on the fundamentals of preventive maintenance and inspection procedures for gasoline and diesel powered tractor trailers. Includes drivelines, brake systems, electrical systems and accessories encountered by the professional truck driver. Co-requisites: TRK 101 and 103. Lecture 1 hour per week.

**TRK 103****Tractor Trailer Driving**

9 credits

Prepares the prospective driver to operate a motor vehicle in a safe and responsible manner. Provides practical training in over-the-road and city driving, including backing skills, and pre-trip inspection. Emphasizes defensive driving. Co-requisites: TRK 101 and 102. Lecture 3 hours. Laboratory 12 hours. Total 15 hours per week.

**TRK 110**

**Survey of the Trucking Industry**

3 credits

Provides an overview of the trucking industry and the characteristics of the professional truck driver. Emphasizes the uses of technology in the trucking industry, including simulators, mobile information management and communication, and electronic mapping techniques. Provides an introduction to the transportation of hazardous materials and environmental issues. Lecture 3 hours per week.

**Welding****WEL 100****Fundamentals of Welding**

3 credits

Introduces arc and oxyfuel welding and cutting. Provides fundamental principles of joining ferrous and non-ferrous metals, welding and cutting processes, equipment operation, and safety procedures with emphasis upon welding and cutting procedures. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**WEL 117****Oxyfuel Welding and Cutting**

3 credits

Introduces history of oxyacetylene welding, principles of welding and cutting, nomenclature of the equipment, development of the puddle, running flat beads, and butt welding in different positions. Explains silver brazing, silver and soft soldering, and safety procedures in the use of tools and equipment. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**WEL 123****Shielded Metal Arc Welding (Basic)**

3 credits

Teaches operation of AC and DC power sources, welding polarities, heats and electrodes for use in joining various metal alloys by the arc welding process. Deals with running beads, butt, and fillet welds in all positions. Emphasizes safety procedures. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**WEL 124****Shielded Metal Arc Welding (Advanced)**

3 credits

Continues instruction on operation of AC and DC power sources, welding polarities, heats and electrodes for use in joining various metal alloys by the arc welding process. Deals with running beads, butt, and fillet welds in all positions. Emphasizes safety procedures. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**WEL 126****Pipe Welding I**

3 credits

Teaches metal arc welding processes including the welding of pressure piping in the horizontal, vertical, and horizontal-fixed positions in accordance with section IX of the ASME Code. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**WEL 135****Inert Gas Welding**

2 credits

Introduces practical operations in the use of inert gas shielded arc welding. Studies equipment operation, setup, safety and practice of GMAW (MIG) and GTAW (TIG). Prerequisite: WEL 117. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**WEL 136****Welding III (Inert Gas)**

2 credits

Studies Tungsten and metallic inert gas procedures and practices including principles of operation, shielding gasses, filler rods, process variations and applications, manual and automatic welding, equipment and safety. Prerequisite: WEL 117. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**WEL 138****Pipe and Tube Welding**

2 credits

Develops entry level skills for the inert gas tungsten welding process (TIG) with emphasis upon thin and thick wall carbon and stainless piping and tubing. Prerequisite: WEL 136. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**WEL 141-142****Welder Qualification Tests I-II**

3 credits each

Studies techniques and practices of testing welding joints through destructive and non-destructive testing. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**WEL 150****Welding Drawing and Interpretation**

2 credits

Teaches fundamentals required for successful drafting as applied to the welding industry. Includes blueprint reading, geometric principles of drafting and freehand sketching, basic principles of orthographic projection, preparation of drawings and interpretation of symbols. Lecture 2 hours per week.