

**ACCOUNTING****Introduction to Bookkeeping***ACC 100 • 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.

**Hotel and Restaurant Accounting***ACC 116 • 3 credits*

Applies accounting principles and practices to the hospitality industry. Studies the accounting cycle of recording, summarizing, and reporting financial information. Analyzes information from the viewpoint of the hospitality industry manager. Lecture 3 hours per week.

**Principles of Accounting I***ACC 211 • 3 credits*

Presenting accounting principles and their application to various businesses. Covers the accounting cycles, income determination, and financial reporting. Studies services, merchandising, and includes internal controls. Requires the use of a microcomputer. Lecture 3 hours per week.

**Principles of Accounting II***ACC 212 • 3 credits*

Continues Accounting 211 with emphasis on application to partnerships, corporations and the study of financial analysis. Includes an introduction to cost and managerial accounting. Requires the use of a microcomputer. Prerequisite: ACC 211. Lecture 3 hours per week.

**Computerized Accounting***ACC 215 • 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 corequisite: ACC 212 or equivalent. Lecture 3 hours per week.

**Analyzing Financial Statements***ACC 217 • 3 credits*

Explains how financial data are generated and the limitations of the data, techniques for analyzing the flow of a business's funds, and the methods for selecting and interpreting financial ratios. Highlights the conceptual framework for analysis, offers basic and advanced analytical techniques

through the use of comprehensive case studies. Prerequisite: ACC 211. Lecture 3 hours per week.

**Intermediate Accounting I***ACC 221 • 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.

**Intermediate Accounting II***ACC 222 • 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 221 or equivalent. Lecture 4 hours per week.

**Cost Accounting I-II***ACC 231-232 • 3 credits each*

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

**Auditing I-II***ACC 241-242 • 3 credits each*

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 222 or 224 or equivalent. Lecture 3 hours per week.

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

**Cooperative Education in Accounting***ACC 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**Accounting for Small Business***ACC \_\_\_\_ • 3 credits*

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

**ACQUISITION AND PROCUREMENT****Introduction to Acquisition and Procurement Fundamentals I-II***ACQ 121-122 • 3 credits each*

Emphasizes contracting with the government. Covers entire government/industry contracting cycle including funding, procurement methods, types of contracts, source selection, negotiations, and contract administration. Satisfies requirements of the mandatory Department of Defense course: Management of Defense Acquisition Contracting Fundamentals when combined with DOD materials. Lecture 3 hours per week.

**Contract Law***ACQ 215 • 3 credits*

Provides an introduction to government contract law. Covers legal aspects associated with contracting and the administration of contracts. Emphasizes the dispute process, including administrative and judicial methods of resolution of contract disputes. Satisfies requirements of the mandatory Department of Defense course: Government Contracts-Law when combined with DOD materials. Lecture 3 hours per week.

**Advanced Acquisition and Procurement Management I-II***ACQ 221-222 • 3 credits each*

Covers advanced areas of contract management, accounting principles, contractor controls, contract administration, organizations, terminations, disputes, subcontractor controls and relationships. Satisfies requirements of the mandatory Department of Defense course: Management of Defense Acquisition Contracts-Advanced when combined with DOD materials. Lecture 3 hours per week.

## COURSE DESCRIPTIONS

**Principles of Contract Pricing and Negotiations I-II***ACQ 231-232 • 3 credits each*

Includes an estimation of 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. Individual and group negotiation activities address the fundamentals of the negotiation process, including essential techniques, strategies and tactics. Satisfies requirements of the mandatory Department of Defense course: Principles of Contract Pricing 1990 when combined with DOD materials. Lecture 3 hours per week.

**Cooperative Education in Acquisition***ACQ 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**ADMINISTRATION OF JUSTICE****The Juvenile Justice System***ADJ 105 • 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.

**Introduction to Law Enforcement***ADJ 110 • 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.

**Law Enforcement Organization and Administration I-II***ADJ 111-112 • 3 credits each*

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. Prerequisite for ADJ 112: divisional approval or ADJ 111. Lecture 3 hours per week.

**Introduction to Corrections***ADJ 140 • 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.

**Criminology***ADJ 201 • 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.

**Criminal Law, Evidence and Procedures I-II***ADJ 211-212 • 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.

**First Line Supervision***ADJ 230 • 3 credits*

A supervisory development course for law enforcement. Includes a study of administration, legal issues, interpersonal and organizational communication, human resource management, internal and external influences, leadership, ADA issues and minority issues concerning supervisors and supervision. Lecture 3 hours per week.

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

Examines the history of police-community relations and the role of both the community and the police in establishing a crime fighting part-

nership for success. Emphasis is on building relationships between police officers and the community they serve. Case studies from various cities that have undertaken the philosophy of community policing will be explored. Lecture 3 hours per week.

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

Discusses the historical issues that have kept family violence hidden for so many centuries. Presents current trends that are dealing with domestic violence as the crime it represents. Lecture 3 hours per week.

**Principles of Criminal Investigation***ADJ 236 • 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.

**Criminal Behavior***ADJ 247 • 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.

**Forensic Pathology***ADJ 275 • 3 credits*

Introduces the pathology and physiology of the human body with emphasis on scientific name and technique used in medico-legal investigations of death. Studies types of death, the mechanisms of death and death reflex, and the determining of the cause of death by postmortem examination. Lecture 3 hours per week.

**Cooperative Education in Administration of Justice***ADJ 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**Seminar and Project***ADJ 298 • 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. May be repeated for credit. Variable hours per week.

**ADMINISTRATIVE SUPPORT TECHNOLOGY****Keyboarding I***AST 101 • 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.

**Keyboarding II***AST 102 • 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.

**Editing/Proofreading Skills***AST 107 • 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.

**Keyboarding for Information Processing***AST 114 • 1 credit*

Teaches the alphabetic and numeric keys. Develops correct techniques and competency in the use of computer keyboards. Includes basic correspondence and report formats. Lecture 1 hour per week.

**Keyboarding for Computer Usage***AST 117 • 1 credit*

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

**Word Processing I***AST 132 • 1 credit*

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

**Word Processing II***AST 133 • 1 credit*

Presents formatting and editing features of a word processing program. Lecture 1 hour per week.

**Word Processing III***AST 134 • 1 credit*

Continues work with formatting features and text enhancements of a word processing program. Lecture 1 hour per week.

**Records Management***AST 137 • 3 credits*

Teaches filing and records management procedures for hard copy, electronic, and micrographic systems. Identifies equipment, supplies, and solutions to records management problems. Lecture 3 hours per week.

**Educational Office Procedures and Records Management***AST 138 • 3 credits*

Teaches office procedures and records management systems for an educational environment. Includes document preparation, visual aids, and confidential and legal issues. Lecture 3 hours per week.

**Word Processing I***AST 141 • 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.

**Word Processing II***AST 142 • 3 credits*

Teaches advanced software applications such as macros, graphics, sorting, and the Internet. Prerequisite: AST 141 or equivalent. Lecture 3 hours per week.

**Introduction to Presentation Software***AST 147 • 1 credit*

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

**Desktop Publishing I***AST 150 • 1 credit*

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

**Introduction to Call Center Services***AST 171 • 3 credits*

Introduces concepts and skills needed to be an effective customer service representative for a telephone service operation. Covers call center theory and technology, interpersonal communication skills, customer relations attitudes, telecommunication techniques, and professional procedures to handle a variety of customer service sales requests. Lecture 3 hours per week.

**Keyboarding III***AST 201 • 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.

**Business Communications***AST 205 • 3 credits*

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

**Specialized Software Applications***AST 236 • 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. Meets college's computer competency requirements.

**Machine Transcription***AST 240 • 3 credits*

Develops proficiency in the use of transcribing equipment to produce business documents. Emphasizes listening techniques, business English, and proper formatting. Includes production rate and mailable copy requirements. Corequisite: AST 102 or equivalent. Lecture 3 hours per week.

**Office Administration I***AST 243 • 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.

## COURSE DESCRIPTIONS

**Office Administration II***AST 244 • 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.

**Medical Machine Transcription***AST 245 • 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.

**Advanced Desktop Publishing I***AST 253 • 3 credits*

Introduces specific desktop publishing software. Teaches document layout and design, fonts, type style, style sheets, and graphics. Prerequisite: AST 141 or equivalent and experience in using a word processing package. Lecture 3 hours per week.

**Advanced Desktop Publishing II***AST 254 • 3 credits*

Presents advanced features of desktop publishing software, culminating in the layout and design of complex multi-page documents. Prerequisite: AST 253 or equivalent. A laboratory co-requisite (AST 256) may be required. Lecture 3 hours per week.

**Medical Office Procedures I***AST 271 • 3 credits*

Covers medical office procedures, records management, preparation of medical reports, and other medical documents. Corequisite: AST 102 or equivalent. Lecture 3 hours per week.

**Medical Office Procedures II***AST 272 • 3 credits*

Develops skills in the performance of administrative and support services in a medical setting. Covers professional ethics, medical legal issues, and interaction with patients. Prerequisite: AST 271 or equivalent. Lecture 3 hours per week.

**Cooperative Education in Administrative Support Technology***AST 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**AIR CONDITIONING AND REFRIGERATION****Air Conditioning and Refrigeration Controls I-II***AIR 111-112 • 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.

**Duct Fabrication and Maintenance I-II***AIR 113-114 • 3 credits each*

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 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Duct Construction and Maintenance***AIR 116 • 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 Conditioning and Refrigeration I***AIR 121 • 3 credits*

Studies refrigeration theory, tools and equipment, soldering, brazing, refrigeration systems, system components, compressors, evaporators, metering devices. Provides laboratory application of refrigerators and freezers. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Air Conditioning and Refrigeration II***AIR 122 • 3 credits*

Presents operations of commercial refrigeration systems, ice machines, design, installation and service, air conditioning and heat pumps. Prerequisite: AIR 121. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Heating Systems I***AIR 154 • 3 credits*

Introduces types of fuels and their characteristics of combustion; types, components and characteristics of burners, and burner efficiency analyzers. Prerequisite: AIR 111. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Heating, Air Conditioning and Refrigeration Calculations I***AIR 161 • 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 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Air Conditioning Systems I***AIR 165 • 3 credits*

Introduces comfort survey, house construction, load, types of distribution systems, calculations, and equipment selection. Prerequisite: AIR 161. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Hydronics***AIR 200 • 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.

**Psychrometrics***AIR 206 • 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. Lectures 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Air Conditioning and Refrigeration Controls III-IV***AIR 213-214 • 3 credits each*

Introduces electrical, pneumatic and electronic control circuits as applied to year-round air conditioning systems. Includes reading wiring and schematic diagrams, trouble-shooting, and designing high and low voltage control systems. Prerequisites: AIR 111 and 112. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Heat Pumps***AIR 235 • 3 credits*

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

**Advanced Troubleshooting and Service***AIR 238 • 3 credits*

Presents advanced service techniques on 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.

**Cooperative Education in Air Conditioning and Refrigeration***AIR 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**ARCHITECTURE****Introduction to Architecture***ARC 100 • 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.

**Architectural Drafting I***ARC 121 • 3 credits*

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.

**Architectural Drafting II***ARC 122 • 3 credits*

A continuation of Architectural Drafting I. Requires development of a limited set of working drawings, including a site plan and related details, and pictorial drawings. Prerequisite: ARC 121 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Construction Methodology and Procedures I***ARC 133 • 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.

**Principles of Construction Safety***ARC 140 • 2 credits*

Covers construction industry operations and hazards control. Includes principles and practices of accident prevention, cost analysis, investigation techniques, reporting, first aid, protection equipment and general safety principles. Lecture 2 hours per week.

**Introduction to****Computer Aided Drafting***ARC 210 • 2 credits*

Gives overview of use of computers as applied to architectural drawing. Covers software capability of the system by generating, moving, editing, or deleting the basic elements. Uses CRT keyboard, table/menu, and other items that make up the system. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Computer Aided Drafting Applications***ARC 211 • 2 credits*

Utilizes computer's hardware and software to create orthographic and pictorial drawings. Requires creation of working drawings by adding the necessary sections, dimensions, and notes to the computer generated views. Prerequisite: ARC 210 or equivalent. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Introduction to Landscape Architecture and Site Planning***ARC 220 • 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, facilities. Lecture 3 hours per week.

**Building Mechanical Equipment***ARC 244 • 2 credits*

Studies heating, air conditioning, plumbing and electrical equipment, materials and symbols. Employs building code interpretation of working drawings and coordination of mechanical and electrical features with structural architectural design. Lecture 2 hours per week.

**Building Codes, Contract Documents and Professional Office Practices***ARC 258 • 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.

**Cooperative Education in Architecture***ARC 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**ARTS****History of Modern Art***ART 106 • 3 credits*

Surveys the history of modern architecture, sculpture, painting, and graphic arts in representational and non-representational forms. Focuses on the periods and movements that influenced the arts of the twentieth century. Emphasizes contemporary art forms, particularly the interaction between art and society, industry, and design. Lecture 3 hours per week.

**Museum Survey***ART 107 • 1 credit*

Assigns visits to museums and art galleries locally and statewide. Requires completion of a critical paper on selected exhibited works. Laboratory 3 hours per week.

## COURSE DESCRIPTIONS

**History of Women Artists***ART 109 • 3 credits*

Surveys the work of women artists through history. Lecture 3 hours per week.

**Advertising Copy Writing***ART 110 • 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.

**Introduction to the Arts I-II***ART 111-112 • 3 credits each*

Parallels studio classes and provides a general survey of the arts. Emphasizes perception, using major monuments of painting, sculpture, and architecture as examples. Lecture 3 hours per week.

**General Art I-II***ART 113-114 • 3 credits each*

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.

**Design for the Web I***ART 116 • 1 credit*

Introduces the basic elements of web page design: typography, imagery, and color, and examines how they are combined to create effective layouts. Teaches organization of materials, sketching and concept development, site planning and various methods of construction. Lecture 3 hours per week.

**Drawing I-II***ART 121-122 • 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 a 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.

**Introduction to Multimedia***ART 130 • 4 credits*

Introduces the student to the basic components of multimedia: text, graphics,

animation, sound, and video, and explores how the components combine to create a multimedia product. Emphasizes the design aspects of multimedia projects and teaches the techniques required to develop a presentation. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**Visual Arts Foundation***ART 133 • 4 credits*

Covers tools and techniques, design principles, and color theory. Introduces computers. Applicable to all fields of visual art. Co-requisite: Visual Arts Orientation. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.

**Three-Dimensional Design***ART 134 • 3 credits*

Explores the concepts of three-dimensional design applicable to all fields of visual art. Prerequisite: ART 133. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

**Typography I-II***ART 141-142 • 4 credits each*

Studies the history of letter forms and type faces 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.

**Theory and Practice of Ceramics I-II***Art 151-152 • 3 credits each*

Teaches basic hand processes of pottery as applicable to tableware, decorative, functional and non-functional form. Includes throwing, coiling, slab building, and press molding. Generates a fundamental understanding of the craft through physical manipulation of materials, consideration of design techniques and historical example. Provides opportunity to work on original design from the clay to firing or glazing. Must be taken in sequence. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

**Ceramics I-II***ART 153-154 • 4 credits each*

Presents problems in the design and production of functional and non-functional ceramic works. Includes hand building, the potter's wheel, and clays and glazes. Must be taken in sequence. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.

**History of Art I-II***ART 201-202 • 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.

**Animation I***ART 203 • 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. Prerequisite: Art 122. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**Animation II***ART 204 • 4 credits*

Continues to develop the student's skills in the techniques of animation. Emphasizes the electronic means of transforming both two- and three-dimensional designs into complete, high quality animations. Prerequisite: ART 133 and 283. Lecture 2 hours, Studio Instruction 4 hours. Total 6 hours per week.

**Development of Architecture***ART 205 • 3 credits*

Examines the principles, methods and literature of architectural history and aesthetics. Addresses basic architectural problems of function, material, technique, and space. Lecture 3 hours per week.

**Video Techniques***ART 208 • 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 students in the development of sophisticated typographic design. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**Drawing III-IV***ART 221-222 • 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. Variable hours per week.

### **Sculpture I-II**

*ART 231-232 • 3 credits each*

Introduces sculptural concepts and methods of production in traditional and contemporary media. Includes clay, plaster, wood, stone, metal, plastics and terracotta. May include field trips. Prerequisite: ART 134. Must be taken in sequence. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

### **Functional Ceramics**

*ART 235 • 4 credits*

Explores the design and production of functional ceramics, including handbuilding and use of the wheel. Prerequisite: ART 154 or divisional approval. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.

### **Painting I-II**

*ART 241-242 • 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. Variable hours per week.

### **Watercolor I-II**

*ART 243-244 • 3 credits each*

Presents abstracts 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.

### **Painting Technique for Illustrators**

*ART 247 • 4 credits*

Introduces materials and techniques used by the illustrator. Includes water-soluble paints (watercolor, acrylic, gouache), oil-based paints, and mixed media. Prerequisites: ART 122 and ART 133 or divisional approval. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week.

### **Communication Design I-II**

*ART 251-252 • 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 on contemporary art on design. Must be taken in sequence. Prerequisite: ART 133. Lecture 2 hours. Studio instruction 3 hours. Total 5 hours per week.

### **Illustration I-II**

*ART 261-262 • 3 credits each*

Studies the methods and materials used in various types of book and magazine publishing. Must be taken in sequence. Prerequisite: ART 122. Variable hours per week.

### **Printmaking I-II**

*ART 271-272 • 3 credits each*

Introduces the student to the full range of printmaking techniques. Includes woodcut, silk-screen, etching, and lithography. Provides historical perspectives on printmaking. Must be taken in sequence. Lecture 2 hours. Studio instruction 3 hours. Total 5 hours per week.

### **Computer Graphics I-II**

*ART 283-284 • 4 credits each*

Introduces microcomputers and software used to produce computer graphics. Employs techniques learned to solve studio projects that reinforce instruction and are appropriate for portfolio use. Prerequisite: ART 133. Must be taken in sequence. Lecture 2 hours. Studio instruction 4 hours. Total 6 hours per week. ART 283 replaces ART 285.

### **Portfolio and Resume Preparation**

*ART 287 • 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.

### **Coordinated Internship in Visual Arts**

*ART 290 • 3 credits*

Supervised on-the-job training in visual arts industry. In exchange for 10 hours per week, student produces portfolio quality work and/or receives training relevant to student's program. For students in second year of study. Ten hours per week. Division chair permission required.

### **Cooperative Education in Arts**

*ART 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week. Division chair approval required.

## **AUTOMOTIVE**

### **Introduction to Automotive Systems**

*AUT 101 • 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.

### **Small Gasoline Engines**

*AUT 156 • 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.

### **Automotive Diagnostics I-II**

*AUT 166-167 • 5 credits each*

Presents the application of operation theory and diagnostic procedures on general engine mechanical and electrical systems. Course emphasis is on diagnostic procedures using the latest diagnostic equipment. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

### **Automotive Diagnostics III-IV**

*AUT 168-169 • 5 credits each*

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

## COURSE DESCRIPTIONS

**Automotive Diagnostics V-VI***AUT 220-221 • 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. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

**Automotive Diagnostics VII-VIII***AUT 247-248 • 5 credits each*

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

**Cooperative Education in Automotive***AUT 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**AVIATION****Private Pilot Ground School***ARO 121 • 3 credits*

Presents the fundamental principals of flight including theory of flight, aircraft standards and specifications, basic aircraft construction, weight and balance, navigation, meteorology, principles of radio communication and application of aerophysics. Prepares students for the FAA examination for private pilot rating. Lecture 3 hours per week.

**Instrument Pilot Ground School***ARO 122 • 3 credits*

Covers principles applicable to instrument aviation requirements. Includes study of aerodynamics pertaining to instrument flight, flight instruments, and airways. Prepares students for the FAA examination for instrument pilot rating. Lecture 3 hours per week.

**Commercial Pilot Ground School***ARO 123 • 3 credits*

Presents advanced theory of flight covering navigation, meteorology, radio communication, aerophysics, and performance. Studies

federal aviation regulations. Prepares students for the FAA examination for the commercial pilot rating. Lecture 3 hours per week.

**Aviation Safety***ARO 140 • 3 credits*

Presents fundamentals essential to safe flight, instruments used, and the evaluation and interpretation of their indications. Deals with weight and balance problems. Discusses federal aviation regulations pertaining to safe flight. Lecture 3 hours per week.

**Aviation Law***ARO 210 • 3 credits*

Provides insight into federal agencies, as well as international, federal, and local laws forming the present structure of aviation law. Lecture 3 hours per week.

**Meteorology***ARO 220 • 3 credits*

Presents an introduction to interpretation of meteorological phenomena affecting flight. Studies basic concepts of aviation meteorology; temperature, pressure, moisture, stability, clouds, air masses, fronts, thunderstorms, icing, fog. Analyzes the weather data for flight planning and safe flying. Teaches interpretation of national weather service maps, reports, and forecasts. Lecture 3 hours per week.

**BIOLOGY****Foundations of Biology***BIO 01 • 1-4 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. Variable hours per week.

**Basic Human Biology***BIO 100 • 3 credits*

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

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

**Human Anatomy and Physiology I-II***BIO 141-142 • 4 credits each*

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

**Introductory Microbiology***BIO 150 • 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.

**General Ecology***BIO 270 • 4 credits*

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

**Marine Ecology***BIO 275 • 4 credits*

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

**Freshwater Ecology***BIO 276 • 4 credits*

Applies ecosystem concepts to freshwater habitats. Includes laboratory and fieldwork. prerequisites: BIO 101-102 or division chair approval. Lecture 3 hours. Recitation and laboratory 3 hours. Total 6 hours per week.

**Coastal Ecology***BIO 278 • 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.

**Biological Problems in Contemporary Society***BIO 285 • 3 credits*

Discusses major biological problems facing society which may include environmental and health concerns such as pollution, bioengineering, drug abuse, conservation, famine and others. Lecture 3 hours per week.

**BUSINESS MANAGEMENT AND ADMINISTRATION****Introduction to Business***BUS 100 • 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, finance, marketing, production, and risk and human resources management. Lecture 3 hours per week.

**Principles of Supervision***BUS 111 • 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.

**Organizational Behavior***BUS 115 • 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.

**Applied Business Mathematics***BUS 125 • 3 credits*

Applies mathematics to business processes and problems such as checkbook records and bank reconciliation, simple interest, present value, bank discount notes, depreciation, commercial discounts, markup and markdown, distribution of profit and loss in partnerships, distribution of corporate dividend, sinking funds, compound inter-

est, amortization, annuities, and multiple payment plans. Prerequisite: MTH 121. Lecture 3 hours per week.

**Small Business Management***BUS 165 • 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.

**Principles of Management***BUS 200 • 3 credits*

Teaches management and the management functions of planning, organizing, directing 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.

**Applied Management Principles***BUS 202 • 3 credits*

Focuses on management practices and issues. May use case studies and/or management decision models to analyze and develop solutions to management problems. Prerequisite: BUS 200 or BUS 150. Lecture 3 hours per week. Replaces BUS 155.

**Human Resource Management***BUS 205 • 3 credits*

Introduces employment, selection, and placement of personnel, usage levels and methods, job descriptions, training methods and programs, and employee evaluation systems. Includes procedures for management of human resources and uses case studies and problems to demonstrate implementation of these techniques. Lecture 3 hours per week.

**Probability and Statistics for Business and Economics***BUS 216 • 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: IST 117 and MTH 163. Lecture 3 hours per week.

**Introduction to Business Statistics***BUS 220 • 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 number, and time series analysis. Prerequisite: MTH 121. Lecture 3 hours per week.

**International Business Practice Firm***BUS 230 • 4 credits*

Uses an international business model that prepares student to work as team members in a simulated business firm operating in a virtual economy. Provides tools for students to perform various business functions as their firm transacts business with other students operating business practice firms throughout Europe, Canada, Mexico, and the United States. Involves students in decision making, critical thinking, and team activities. Prerequisite: Advanced status and computer literacy. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

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

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

**International Transportation and Logistics***BUS 237 • 3 credits*

Introduces the students to issues affecting the efficient movement of goods and the various forms of transportation that may be utilized in the international distribution process. Lecture 3 hours per week.

**Export Management***BUS 238 • 3 credits*

Examines the activities within the export management function as part of the international trade process, and includes the determination, preparation, coordination, and evaluation of various export management activities such as licensing, joint venturing and budgeting. Lecture 3 hours per week.

## COURSE DESCRIPTIONS

**Export/Import Documentation and Brokerage***BUS 239 • 3 credits*

Introduces custom brokerage procedures and documentation, and includes identification, preparation and interpretation of required documents and related brokerage issues as applied to international trade activity. Lecture 3 hours per week.

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

Presents a broad introduction to legal environment of U.S. business. Develops a basic understanding of contract law and agency and government regulation. Lecture 3 hours per week.

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

Develops a basic understanding of the uniform commercial code relating to business organization, bankruptcy, and personal and real property. Prerequisite: BUS 241 or divisional approval. Lecture 3 hours per week.

**Introduction to International Business***BUS 280 • 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.

**Cooperative Education in Business Management and Administration***BUS 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**Legal Aspects of Small Business Operations***BUS \_\_\_\_ • 3 credits*

Studies the legal environment of the small business. Includes choosing a lawyer, legal form of business, copyrights, trademarks, patents, licenses, permits, and contracts. Lecture 3 hours per week.

**Small Business Planning***BUS \_\_\_\_ • 2 credits*

Teaches the concepts and skills needed in writing a successful small business plan.

Emphasizes the preparation of a plan through cases and simulations. Considered a capstone course. Prerequisites: ACC 115, BUS 165, BUS 295, FIN 295, MKT 295. Lecture 2 hours per week.

**CHEMISTRY****Chemistry***CHM 01 • 1 - 5 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. Variable hours per week.

**General Chemistry I-II***CHM 101-102 • 4 credits each*

Emphasizes experimental and theoretical aspects of inorganic, organic, and biological chemistry. Discusses general chemistry concepts as they apply to issues within our society and environment. Designed for the non-science major. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**College Chemistry I-II***CHM 111-112 • 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.

**Health Science Chemistry I-II***CHM 121-122 • 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.

**Organic Chemistry I-II***CHM 241-242 • 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. Corequisites: CHM 245-246. Lecture 3 hours per week.

**Organic Chemistry Laboratory I-II***CHM 245-246 • 2 credits each*

Includes qualitative organic analysis. Corequisites: CHM 241-242. Laboratory 6 hours per week.

**CHILDHOOD DEVELOPMENT****Music and Movement for Children***CHD 109 • 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 0-3 hours. Laboratory 0-9 hours. Total 3-9 hours per week.

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

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

**Creative Activities for Children***CHD 125 • 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.

**Science and Math Concepts for Children***CHD 126 • 3 credits*

Teaches selecting developmentally appropriate learning activities using materials to develop logical thinking skills in the child. Lecture 3 hours per week.

**Infant and Toddler Programs***CHD 166 • 3 credits*

Examines the fundamentals of infant and toddler development, including planning and implementing programs in group care. Emphasizes meeting physical, social, emo-

tional, and cognitive needs: scheduling, preparing age-appropriate activities, health and safety policies, record keeping, and reporting to parents. Lecture 3 hours per week.

#### **Guiding the Behavior of Children**

*CHD 205 • 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.

#### **Introduction to Exceptional Children**

*CHD 210 • 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.

#### **Introduction to School-Age Child Care**

*CHD 220 • 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.

#### **Curriculum Development for School-Age Child Care**

*CHD 225 • 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.

#### **Behavior Management for School-Age Child Care**

*CHD 230 • 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 way 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.

#### **Health and Recreation for School-Age Child Care**

*CHD 235 • 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.

#### **Administration of Childcare Programs**

*CHD 270 • 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 recordkeeping. Lecture 3 hours per week.

#### **Coordinated Internship**

*CHD 290 • 1-5 credits*

Supervised on-the-job training in selected business, industrial, or service firms coordinated by the college. Credit/practice ratio maximum 1:5 hours. May be repeated for credit. Variable hours per week. Note: Students must consult the appropriate division chair, program coordinator or instructor before enrolling in this course.

## **CHINESE**

#### **Beginning Spoken Chinese I-II**

*CHI 101-102 • 4 credits each*

Introduces the speech sounds and tones of modern spoken Chinese (Mandarin) along with basic sentence patterns and modes of expression. May include an additional hour of oral drill and practice per week. Lecture 4 hours per week.

## **CIVIL ENGINEERING TECHNOLOGY**

#### **Civil Engineering Drafting**

*CIV 115 • 3 credits*

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

#### **Topographic Drafting**

*CIV 116 • 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 presentation. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

#### **Construction Management and Estimating**

*CIV 135 • 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.

#### **Surveying I**

*CIV 171 • 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: Engineering Technical Mathematics or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

#### **Surveying II**

*CIV 172 • 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.

#### **Soil Mechanics**

*CIV 225 • 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. Lecture 2 hours per week.

#### **Soil Mechanics Laboratory**

*CIV 226 • 1 credit*

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

#### **Concrete Technology**

*CIV 228 • 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. Lecture 2 hours per week.

## COURSE DESCRIPTIONS

**Concrete Laboratory***CIV 229 • 1 credit*

Focuses on mixing, curing, testing and quality control of concrete. Laboratory 2 hours per week.

**Asphalt Technology***CIV 235 • 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. Lecture 2 hours per week.

**Asphalt Laboratory***CIV 236 • 1 credit*

Focuses on testing and quality control of bituminous material, mixing, testing and quality control of asphalt cements. Laboratory 2 hours per week.

**Fluid Mechanics and Hydraulics***CIV 240 • 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.

**Introduction to Environmental Engineering***CIV 280 • 3 credits*

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

**Cooperative Education in Civil Engineering***CIV 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**COMPUTER SCIENCE****Introduction to Computing***CSC 110 • 3 credits*

Introduces problem solving via a programming language. Examines development of computers and properties of programming languages. Covers input, storage, data manipulation, software and hardware. Lecture 3 hours per week.

**Computer Science I***CSC 201 • 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. Corequisites: CSC 100 and MTH 173 or equivalent or divisional approval. Lecture 4 hours per week.

**Computer Science II***CSC 202 • 3 credits*

Examines data structures and algorithm analysis. Covers data structures including sets, strings, stacks, queues, arrays, records, files, linked lists, and trees, abstract data types, algorithm analysis including searching and sorting methods, and file structures. Prerequisites: CSC 201 and MTH 173. Lecture 3 hours per week.

**Computer Organization***CSC 205 • 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 202. Lecture 3 hours per week.

**Programming with C++***CSC 210 • 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 and 202, or EGR 125 or permission of the instructor. Lecture 4 hours per week.

**Advanced Computer Organization***CSC 215 • 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.

**CRAFTS****Introduction to Pottery***CRF 105 • 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.

**Pottery Glazing and Decorating***CRF 106 • 3 credits*

Explores the various techniques of decorating and glazing pottery including the use of texture, colored slips and engobes, wax resist, graffito, and glaze experimentation. Prerequisite: ART 105. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

**Studio Production Pottery I***CRF 140 • 2 credits*

Introduces design and development of studio production prototypes. Teaches techniques of drawing, hand building, and throwing on the potter's wheel for production. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Studio Production Pottery II***CRF 141 • 2 credits*

Continues teaching development of production prototypes, design, techniques of drawing, hand building, and throwing on the potter's wheel for production pottery. Prerequisite: CRF 140. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Studio Production Pottery III***CRF 142 • 2 credits*

Continues design and production prototypes. Introduces studio pottery production methods and continues techniques of drawing, hand building, and throwing on the potter's wheel for production pottery. Prerequisite: CRF 141. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Studio Production Pottery IV***CRF 146 • 2 credits*

Continues production methods, design, and production prototypes. Introduces glazing research and firing principles for studio production pottery. Continues techniques of drawing, hand building, and throwing on the potter's wheel for production pottery. Prerequisite: CRF 142. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Studio Production Pottery V***CRF 147 • 2 credits*

Continues teaching glazing research, firing principles, production methods, design, and production prototypes. Introduces studio production pottery finishing. Continues teaching techniques of drawing, hand building, and throwing on the potter's wheel for production pottery. Prerequisite: CRF 146. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Studio Production Pottery VI***CRF 148 • 2 credits*

Continues teaching production finishes, glazing research, firing principles, production methods, design, production prototypes, techniques of drawing, hand building, and throwing on the potter's wheel for production pottery. Introduces marketing techniques. Prerequisite: CRF 147. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**DIAGNOSTIC MEDICAL SONOGRAPHY****Introduction to Sonography***DMS 206 • 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. Lecture 2 hours per week.

**Sectional Anatomy***DMS 207 • 2 credits*

Studies sectional anatomy in the transverse, longitudinal and coronal planes, with emphasis on the organs of sonographic interest within the abdomino-pelvic cavity. Prerequisite: Current enrollment in the program or divisional approval. Lecture 2 hours per week.

**Ultrasonic Physics and Instrumentation I***DMS 208 • 3 credits*

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

**Ultrasonic Physics and Instrumentation II***DMS 209 • 3 credits*

Focuses on 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.

**Ultrasound Imaging I***DMS 211 • 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. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**Ultrasound Imaging II***DMS 212 • 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.

**Ultrasound Seminar I***DMS 221 • 4 credits*

Introduces the fundamentals of renal failure and transplantations, small parts sonography, basic echocardiography, neonatal neuro-sonography, and rare and interesting ultrasonic case presentations. Prerequisite: Admission to the program. Lecture 4 hours per week.

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

Reviews material covered throughout the sonography program to prepare the student for the ultrasound registry examination. Prerequisite: Admission to the program. Lecture 3 hours per week.

**Introduction to Vascular Ultrasound***DMS 223 • 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. Lecture 3 hours per week.

**Clinical Education I***DMS 231 • 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. Laboratory 15 hours per week.

**Clinical Education II***DMS 232 • 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 231. Laboratory 25 hours per week.

**Clinical Education III***DMS 233 • 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.

**Clinical Education IV***DMS 234 • 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 32 hours per week.

**DIESEL****Diesel Engines I***DSL 121 • 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.

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

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

## COURSE DESCRIPTIONS

**Diesel Fuel and Injection Systems***DSL 133 • 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. Prerequisite: DSL 122 or divisional approval. Lecture 3 hours. Laboratory 6 hours. Total 9 hours per week.

**Diesel Truck Electrical Systems***DSL 143 • 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.

**Diesel Power Trains, Chassis, and Suspension***DSL 152 • 4 credits*

Studies the chassis, suspension, steering and brake system 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.

**Diesel Servicing and Shop Management***DSL 158 • 3 credits*

Studies the principles, practices, and procedures necessary to operate the parts and service departments of a diesel vehicle maintenance facility. Includes proper procedures for a complete vehicle checkout and inspection prior to release for over-the-road hauling, and preventive maintenance and servicing techniques recommended by major manufacturers. Prerequisite: DSL 121 or divisional approval. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Air Brake Systems***DSL 160 • 3 credits*

Studies the basic operational theory of pneumatic and air brake systems used in heavy-duty and public transportation vehicles. Covers various air control valves, test system components, and advanced air sys-

tem schematics. Teaches proper service and preventive maintenance of systems. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Air Brake Systems I***DSL 161 • 2 credits*

Studies the basic operational theory of pneumatic and air brake systems used in public transportation vehicles. Covers various air control valves, test system components, and advanced air system schematics. Prerequisites: sponsorship by a public transit authority and divisional approval. Lecture 2 hours per week.

**DIETETICS****Introduction to Dietetics***DIT 100 • 2 credits*

Orients the student to the field of dietetics, role responsibilities and relationships within the professions, and interrelations with other health professionals. Explains standards and ethics of professional conduct. Lecture 2 hours per week.

**Nutrition I***DIT 121 • 3 credits*

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

**Nutrition II***DIT 122 • 3 credits*

Applies the principles from DIT 121 to the life cycle. Includes current topics such as fad diets, preventive nutrition, weight control, and exercise. Lecture 3 hours per week.

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

**Nutrition and the Athlete***DIT 127 • 3 credits*

Studies the major nutrients and illustrates appropriate eating habits for athletes. Dispels the myths associated with nutrition and peak performance. Lecture 3 hours.

**Food Management Systems***DIT 130 • 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.

**Coordinated Internship in Dietetics***DIT 190 • 1-5 credits*

Includes supervised practice in selected agencies coordinated by the College. Credit/practice ratio maximum 1:5 hours. May be repeated for credit. Variable hours per week.

**Nutritional Assessment***DIT 210 • 3 credits*

Studies the principles of nutritional assessment; procedures used in identifying individuals and groups at risk; and the planning, implementation, monitoring and evaluation of activities required to institute a successful nutritional intervention program. Presents quality assurance requirements and program implementation. Lecture 3 hours per week.

**Therapeutic Nutrition I***DIT 221 • 4 credits*

Applies nutrition principles to the treatment of persons with special dietary needs. Lecture 4 hours per week.

**Coordinated Internship in Dietetics***DIT 290 • 1-5 credits*

Includes supervised practice in selected agencies coordinated by the college. Credit/practice ratio maximum 1:5 hours. May be repeated for credit. Variable hours per week.

**Seminar and Project in Dietetics***DIT 298 • 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. May be repeated for credit. Variable hours per week.

**DRAFTING****Introduction to Electrical/Electronics Drafting***DRF 130 • 2 credits*

Teaches applications of drafting procedures with emphasis on working and functional drawings and direct applications to electrical and electronic components and circuits. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Electrical/Electronics Blueprint Reading***DRF 135 • 2 credits*

Presents an interpretation of basic shop drawings, conventional symbols, terminology, and principles used by the mechanical draftsman. Explains common electrical and electronic symbols, wiring diagrams. Lecture 2 hours per week.

**Engineering Drawing Fundamentals I-II***DRF 151-152 • 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.

**Machine Blueprint Reading***DRF 160 • 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.

**Blueprint Reading I***DRF 161 • 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.

**Architectural Blueprint Reading***DRF 165 • 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.

**Computer-Aided Drafting and Design I***DRF 201 • 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.

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

Teaches working drawings and advanced operations in computer aided drafting. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

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

Teaches use of drafting equipment, with possible CAD applications, emphasizing knowledge and skill required for industrial drawing. May include piping, gearing, geometric and positional tolerances, drawing layout and lettering of all types. Prerequisite: DRF 152 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

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

Teaches concepts of sheet metal fabrication including radii, fillets and tolerances, electrical and electronics symbols and drawing, and advanced design drafting techniques. Prerequisite: DRF 211. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Computer-Aided Modeling and Rendering I-II***DRF 238-239 • 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.

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

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

**Three-dimensional Drafting and Design***DRF 248 • 3 credits*

Introduces ship, aircraft, and automotive design. Study of drafting and design in a three-dimensional grid system to generate offset tables. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Design Capstone Project***DRF 280 • 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, 3D solids, exploration of application software, and the integration of CAD/CAM. Prerequisites: DRF 211 and 212 and DRF 201 or 199. Lecture 3 hours per week.

**Cooperative Education in Drafting***DRF 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**ECONOMICS****Survey of Economics***ECO 120 • 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.

## COURSE DESCRIPTIONS

**Principles of Economics I -  
Macroeconomics***ECO 201 • 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.

**Principles of Economics II -  
Microeconomics***ECO 202 • 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, elasticities, marginal benefits and costs, profits, and production and distribution. Lecture 3 hours per week.

**Economics, Business, and Public Policy***ECO 255 • 3 credits*

Focuses on preparing the student to use the tools of economic analysis to assess the cost and benefit of societal governmental regulation to business and develops the student's understanding of the problems facing business firms in adjusting themselves to this regulation. Prerequisite: ECO 202. Lecture 3 hours per week.

**EDUCATION****Introduction to Developmental  
Disabilities***EDU 130 • 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.

**Behavior Technology for Use with Developmental Disabilities***EDU 135 • 4 credits*

Presents basic principles of behavior modification and behavioral learning theory. Promotes skills in pinpointing, observing, and recording human behavior. Learning ob-

jectives 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.

**Techniques of Observation in Early Care***EDU 160 • 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.

**Audiovisual Materials and Computer  
Software***EDU 225 • 3 credits*

Prepares students to construct graphic teaching aids, to select and develop materials for instructional support, to operate, maintain and use audiovisual equipment used in the classroom. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

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

**The Classroom Aide for the Developmentally  
Disabled***EDU 246 • 3 credits*

Develops competencies in skills required to perform duties of a classroom aide in public or private school settings. Bases curriculum on duties identified through an analysis of the classroom aide job as performed in several local school systems. Emphasizes developing competencies in skills supporting the classroom teachers in the classroom for developmentally disabled individuals ages 2 to 21. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

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

**Teaching Basic Academic Skills to Exceptional Children***EDU 254 • 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). Emphasized exceptionalities for students ages 2–21 under Public Law 94-142. Familiarizes students with the indicators of effective teaching. Lecture 3 hours per week.

**Coordinated Internship in Education***EDU 290 • 1-5 credits*

Supervised on-the-job training in selected business, industrial, or service firms coordinated by the College. Credit/practice ratio maximum 1:5 hours. May be repeated for credit. Variable hours per week. Note: Students must consult the appropriate division chair program coordinator or instructor before enrolling in this course.

**Cooperative Education in Educational  
Services***EDU 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**ELECTRICAL  
TECHNOLOGY****Residential Wiring Methods***ELE 127 • 3 credits*

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

**National Electrical Code I-II***ELE 131-132 • 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 3 hours. Laboratory 3 hours. Total 6 hours per week.

#### **Transformer Connections and Circuits**

*ELE 145 • 2 credits*

Studies transformer theory, symbols, diagrams, connections, terminology and troubleshooting techniques. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

#### **Electric Motor Control**

*ELE 146 • 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. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

#### **Wiring Methods in Industry**

*ELE 149 • 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 3 hours. Total 5 hours per week.

#### **AC and DC Circuit Fundamentals**

*ELE 150 • 3 credits*

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

#### **Power Controls**

*ELE 160 • 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.

#### **Programmable Logic Controller Systems I-II**

*ELE 233-234 • 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.

#### **Cooperative Education in Electricity/Electronics**

*ELE 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

### **ELECTRONICS TECHNOLOGY**

#### **Electronic Fundamentals with Computer Applications**

*ETR 104 • 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. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

#### **Programming Methods for Electrical/Electronic Calculations**

*ETR 106 • 3 credits*

Studies all-purpose symbolic instruction code BASIC. Focuses on applications of BASIC to electrical problem solving and circuit analysis. May require preparation of a report as an out-of-class activity. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

#### **Electronic Mathematics**

*ETR 111 • 2 credits*

Studies electronic logic or computer technology. Includes a basic numbering system and Boolean algebra with applications to logic diagrams and circuits. Lecture 2 hours per week.

#### **DC and AC Fundamentals I-II**

*ETR 113-114 • 4 credits each*

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

#### **Electrical Circuits**

*ETR 125 • 7 credits*

Combines study of D.C. and A.C. circuits, basic electrical components, instruments, laws and techniques used to predict, analyze and measure electrical quantities. Lecture 5 hours. Laboratory 6 hours. Total 11 hours per week.

#### **Electronics I-II**

*ETR 141-142 • 3 credits each*

Introduces electronic devices as applied to basic electronic circuits and systems. Lecture 3 hours per week.

#### **Amplifiers and Integrated Circuits**

*ETR 148 • 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, chippers, modulators and other new devices. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

#### **Survey of Microprocessors**

*ETR 160 • 4 credits*

Provides an overview of microprocessor architecture, basic machine language programming, and I/O devices. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

#### **Digital Circuit Fundamentals**

*ETR 168 • 3 credits*

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

#### **Electronic Devices I-II**

*ETR 203-204 • 3 credits each*

Studies active devices and circuits such as diodes, power supplies, transistors, amplifiers, and others. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

#### **Computer Troubleshooting and Repair**

*ETR 228 • 3-4 credits*

Teaches procedures for isolating and correcting problems in computers and computer-related hardware. Emphasizes operational concepts, use of diagnostic software and troubleshooting equipment. Lecture 1-3 hours. Laboratory 3-6 hours. Total 6-7 hours per week.

#### **Principles of Lasers and Fiber Optics I**

*ETR 231 • 3 credits*

Teaches the theory and application of lasers and fiber optics. Includes optics, fiber optic cables and connectors, photo detectors, optical pulse generation, sensors, multiplexers, lasers, gas lasers, semiconductor lasers, laser safety and laser test instruments. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

## COURSE DESCRIPTIONS

**Principles of Lasers and Fiber Optics II***ETR 232 • 4 credits*

Continues the study of the theory and application of lasers and fiber optics. Includes optics, fiber optic cables and connectors, photo detectors, optical pulse generation, sensors, multiplexers and laser safety. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**Electronic Communications I-II***ETR 241-242 • 4 credits each*

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

**Solid State Circuits***ETR 250 • 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. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**Microprocessor Applications I-II***ETR 261-262 • 4 credits each*

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

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

Studies digital principles, terminology and applications covering number systems, arithmetic, Boolean algebra, Karnaugh maps and advanced local circuits such as A/D, D/A displays and others. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**Introduction to Digital Logic Circuits and Computers***ETR 280 • 4 credits*

Studies digital logic, Boolean algebra, and arithmetic circuits, using standard integrated circuits and the functional block approach. May include the study of registers, encoding and decoding, and

multiplexing. Introduces concepts of computers, the internal operation and control language. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**Cooperative Education***ETR 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**EMERGENCY MEDICAL****Emergency Medical Technician/Basic***EMT 106 • 6 credits*

Prepares student for certification as a Virginia and National Registry EMT/B. Includes all aspects of pre-hospital basic life support as defined by the National Highway Traffic Safety Administration's National Curriculum for Emergency Medicine Technician/Basic. Prerequisite: CPR certification at the Health Care Provider level. Corequisite: EMT 190. Lecture 4 hours. Laboratory 4 hours. Total 8 hours per week.

**Introduction to Technical Rescuer-Rescuer System***EMT 131 • 2 credits*

Prepares the student to understand the intricacy of Rescue Systems and its application in an emergency situation. Includes Incident Command safety, building collapse, strokes, Miller Board and LSP, ladder derrick, ladder hinge, A-Frame ladder, tripod, ladder slide, and basic haul systems. Prerequisite: EMT-B certification and EMT 133. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Introduction to Technical Rescuer-Vehicle Extrication***EMT 132 • 2 credits*

Prepares the student to understand the intricacy of Vehicle Extrication principles and its application in an emergency situation. Includes Kinematics of trauma, safety, vehicle anatomy, new vehicle technology, phases of vehicle rescue, hand tools, lifting and stabilization, hydraulic tools, and special techniques. Prerequisite: EMT-B certification. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Introduction to Technical Rescue-Rope Rescue***EMT 133 • 1 credit*

Prepares the student to understand the intricacy of vertical rescue as used in an emergency situation. Includes ropes and knots, rigging and rappelling. Prerequisite: EMT-B certification. Lecture 1 hour per week.

**Basic EMT/ B Refresher***EMT 155 • 2 credits*

Reviews material covered in the emergency medical technician/basic course. Emphasizes critical decision making and performance objectives. Includes material on recent developments in the area of pre-hospital basic life support. Required for the Virginia and National Registry recertifications as an EMT/B. Prerequisite: Current EMT/B certification or division approval. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Emergency Vehicle Operations***EMT 166 • 1 credit*

Prepares the student for certification as an Emergency Vehicle operator in Virginia. Focuses on legal aspects of emergency vehicle operation, selection of routes, vehicle preparedness, important physical forces and emergency vehicle control, handling unusual situations, and the operation of ambulances. Emphasizes in-vehicle practice including range exercise. Prerequisite: EMT or First Responder. Lecture 1 hour per week.

**Introduction to Advanced Life Support***EMT 176 • 3 credits*

Prepares the student for initial ALS certification and for Virginia and National Registry Intermediate 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 to the 1998 Department of Transportation Curriculum for EMT-Intermediate/Paramedics.) Prerequisite: Current State or National Registry EMT-B and CPR. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Assessment Based Management***EMT 177 • 1 credit*

Prepares the student for Virginia and National Registry Paramedic certification. Focuses on integrating pathophysiological

principles and assessment findings to formulate an impression and implement a treatment plan for patients with common complaints. Includes preparation for the National Registry Paramedic Exam. (Conforms to the 1998 Department of Transportation Curriculum for EMT/Paramedics.) Prerequisite: EMT 176. Lecture 1 hour per week.

#### **EMT- Intermediate I**

*EMT 178 • 3 credits*

Prepares the student for Virginia and National Registry Intermediate certification. Includes the theory and application of the following: cardiovascular and lymphatic anatomy and physiology, dysrhythmia recognition, cardiovascular, pharmacology, assessment, documentation, communications, and definitive management. Reinforces the theory and application of prerequisite courses. (Conforms to the 1998 Department of Transportation Curriculum for EMT-Intermediate/Paramedics.) Prerequisite: EMT 176. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

#### **EMT Intermediate II**

*EMT 179 • 5-6 credits*

Prepares the student for Virginia and National Registry Intermediate certification. Includes the theory and application of the following: neurology, endocrine, poison and overdose, behavioral, environmental, gastrointestinal, pediatrics, gynecology, obstetrics, neonatal pediatrics, and trauma. Reinforces the theory and application of prerequisite courses. (Conforms to the 1998 Department of Transportation Curriculum for EMT-Intermediate/Paramedics.) Prerequisite: EMT 178. Lecture 4-5 hours. Laboratory 2 hours. Total 6-7 hours per week.

#### **ALS Foundations**

*EMT 180 • 4 credits*

Begins preparation for an advanced life support provider as defined by the Department of Transportation's National Paramedic Curriculum. Includes roles/responsibilities, legal aspects, medical incident command, detailed patient assessment, and airway management. Prerequisite: EMT/B Certification and Divisional approval. Lecture 4 hours per week.

#### **ALS Trauma Care**

*EMT 181 • 3 credits*

Continues DOT's National Paramedic Curriculum. Includes ALS pharmacology, drug and fluid administration with emphasis on trauma patient assessment and management. Prerequisite: EMT/B Certification and divisional approval. Lecture 3 hours per week.

#### **ALS Medical Care**

*EMT 182 • 4 credits*

Continues DOT's National Paramedic Curriculum. Emphasis placed upon assessment and management of medical modalities to include cardiac, pulmonary, neurological, endocrine, and other related medical complaints. Prerequisite: EMT/B Certification and divisional approval. Lecture 4 hours per week.

#### **ALS Skills I**

*EMT 183 • 1 credit*

Focuses on the development of advanced life support skills for assessing and managing trauma, medical and specialty patients. Scenario practice in assessment based management. Prerequisite: EMT/B Certification and divisional approval. Laboratory 2 hours per week.

#### **ALS Skills II**

*EMT 184 • 2 credits*

Focuses on the development of advanced life support skills for assessing and managing trauma, medical and specialty patients. Scenario practice in assessment based management. Prerequisite: EMT/B Certification and divisional approval. Laboratory 4 hours per week.

#### **ALS Skills III**

*EMT 185 • 2 credits*

Focuses on the development of advanced life support skills for assessing and managing trauma, medical and specialty patients. Scenario practice in assessment based management. Prerequisite: EMT/B Certification and divisional approval. Laboratory 4 hours per week.

#### **Coordinated Internship**

*EMT 190 • 1-5 credits*

Supervised clinical training in selected clinical affiliates and EMS agencies coordinated by the college. Credit/practice ratio maximum 1:4 hours. May be repeated for credit. Variable hours per week.

#### **Pharmacology**

*EMT 209 • 3 credits*

Focuses on the principles of pharmacokinetics, pharmacodynamics, and drug administration. Includes routes and methods of medication administration, principles of math calculations, general actions of the common drug classifications. Emphasizes drugs used to manage respiratory, cardiac, central nervous system, and endocrine disorders, and includes classification, action, indications, contra-indications, precautions, and patient education. Includes an in depth study of drugs used to manage emergency situations. Prerequisite: EMT/B certification or Health Care Professional. Lecture 3 hours per week.

#### **Pre-Hospital Physiological Assessment**

*EMT 216 • 2 credits*

Focuses on the application of normal anatomy and physiological phenomena to ill and injured individuals. Emphasizes the analysis and interpretation of physiological data to assist in patient assessment and management. Prerequisite: EMT/B certification or Health Care Professional. Lecture 2 hours per week.

#### **Introduction to Cardiology**

*EMT 220 • 2 credits*

Focuses on the interpretation of Lead II electrocardiograms and their significance. Includes an overview of anatomy and physiology of the cardiovascular system including structure, function, and electrical conduction of the heart. (Recommended as a prerequisite or corequisite for the Paramedic curriculum or for individuals responsible for EKG recognition in the workplace.) Prerequisites: EMT/B certification or Health Care Professional. Lecture 2 hours per week.

#### **12 Lead EKG Interpretation**

*EMT 224 • 2 credits*

Prepares the health care professional to perform EKG's and to interpret their findings. Includes advanced concepts that build on the knowledge and skills of basic dysrhythmia determination, and topics needed to understand and manage changes on a 12 lead EKG. Includes Bundle branch blocks and hemiblocks, axis deviation, chamber enlargement, and myocardial ischemic and infarction. Addresses clinical significance and interventions of all changes. Extensive practice at EKG interpretation is provided. Pre-requisite: Must have skill in Lead II EKG interpretation. Lecture 2 hours per week.

## COURSE DESCRIPTIONS

**Advance Life Support Drug Dosage Calculations***EMT 227 • 1 credit*

Focuses on the techniques to accurately calculate and administer the drugs necessary to provide advanced life support emergency care. Pre-requisite: EMT/B certification or Health Care Professional. Lecture 1 hour per week.

**Operations***EMT 245 • 2 credits*

Prepares the student for Virginia and National Registry Paramedic certification. Includes 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 Department of Transportation Curriculum for EMT-Paramedics.) Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**EMT-Cardiac/Paramedic Refresher***EMT 255 • 4 credits*

Reviews material covered in EMT-Intermediate and/or paramedic courses. Emphasizes recent developments in the area of pre-hospital advanced life support. Required for Virginia and National Registry recertification as an Intermediate or Paramedic and Virginia recertification as an EMT-Cardiac. Prerequisite: Current EMT-shock trauma, cardiac, intermediate and/or paramedic certification. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Pathophysiology***EMT 274 • 3 credits*

Focuses on the pathological processes of disease with the 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. Prerequisite: EMT Advanced Life Support Provider or Health Care Professional. Lecture 3 hours per week.

**Concepts in Critical Care***EMT 275 • 6 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 needed to trouble shoot complex monitoring devices and equipment. Topics include 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. Corerequisite: EMT 290. Prerequisite: Current EMT/P, RN or divisional approval. Lecture 5 hours. Laboratory 2 hours. Total 7 hours per week.

**ALS Specialty Care***EMT 280 • 2 credits*

Concludes didactic portion of DOT's National Paramedic Curriculum. Focuses on the assessment and management of specialty patients including behavioral, obstetrical, pediatric, geriatric and the chronically ill. Prerequisite: EMT/B Certification and divisional approval. Lecture 2 hours per week.

**ALS Skills IV***EMT 281 • 2 credits*

Focuses on the development of advanced life support skills for assessing and managing trauma, medical and specialty patients. Scenario practice in assessment based management. Prerequisite: EMT/B Certification and divisional approval. Laboratory 4 hours per week.

**Coordinated Internship***EMT 290 • 1-5 credits*

Supervised clinical training in selected clinical affiliates and EMS agencies coordinated by the college. Credit/practice ratio maximum 1:4 hours. May be repeated for credit. Variable hours per week.

**ENGINEERING****Engineering Graphics***EGR 110 • 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 computer-aided drafting. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Introduction to Engineering***EGR 120 • 2 credits*

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

**Introduction to Engineering Methods***EGR 125 • 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.

**Computer Programming for Engineers***EGR 126 • 3 credits*

Introduces computers, their architecture and software. Teaches program development using flowcharts. Solves engineering problems involving programming in languages such as FORTRAN, PASCAL, or C++. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Engineering Mechanics - Statics***EGR 140 • 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. Lecture 3 hours per week.

**Engineering Mechanics - Dynamics***EGR 245 • 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.

**Mechanics of Materials***EGR 246 • 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.

**Mechanics of Materials Laboratory***EGR 247 • 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 gages and data reduction. Laboratory 2 hours per week.

**Circuit Theory I***EGR 271 • 3 credits*

Teaches basic electrical concepts and laws, the formulation of network equations for resistive networks based on the use of graph theory and linear algebra, network theorems, and network reduction techniques. Lecture 3 hours per week.

**Circuit Theory II***EGR 272 • 3 credits*

Introduces expansion of network equation formulation to include inductive and capacitive networks; network analysis using differential equations, Laplace transforms, and phasor; transfer functions; frequency response; and mutual inductance. Lecture 3 hours per week.

**Circuit Theory Laboratory***EGR 275 • 2 credits*

Presents applications which include demonstrations and validation of electrical concepts from Circuit Theory I and II. Includes electrical concepts, instrumentation, measurement techniques and report writing. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Engineering Electronics***EGR 276 • 3 credits*

Provides an introduction to semiconductor electronics including topics such as diodes, bipolar transistors and field-effect transistors. Discusses semiconductor physics, diode modeling, DC and AC transistor modeling, analysis and design, single-stage amplifiers, and frequency response. Lecture 3 hours per week.

**Digital Logic***EGR 277 • 3 credits*

Provides 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.

**Digital Logic Laboratory***EGR 278 • 2 credits*

Construction of digital logic circuits to verify analysis and design methods. Topics covered include logic gates, combinational and sequential logic circuits, programmable logic devices, measurement techniques, and report writing. Laboratory 4 hours per week.

**Cooperative Education in Engineering***EGR 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**ENGLISH****Preparing for College Writing I***ENG 01 • 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. Lecture 4 hours per week.

**Preparing for College Writing II***ENG 03 • 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. Lecture 4 hours per week.

**Reading Improvement I***ENG 04 • 4 credits*

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

**Reading Improvement II***ENG 05 • 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. Lecture 4 hours per week.

**Writing and Reading Improvement I***ENG 07 • 3-12 credits*

Provides an integrated approach to developing students' assignments successfully by providing them with reading and writing strategies. Variable hours per week.

**Individualized Instruction in Writing***ENG 09 • 3 credits*

Focuses on individual writing needs as determined by student and instructor. Provides support for students simultaneously enrolled in other courses or who want additional writing instruction in a tutorial setting. Lecture 3 hours per week.

**Speed Reading***ENG 106 • 3 credits*

Emphasizes reading faster with comprehension. Includes controlling pace through scanning for specific details, skimming for main ideas, and reading quickly but completely. Presents common ways reading material is organized and techniques for processing information rapidly. Lecture 3 hours per week.

**Critical Reading and Study Skills***ENG 108 • 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.

**College Composition I-II***ENG 111-112 • 3 credits each*

Develops writing ability for study, work, and other areas of writing based on experience, observation, research, and reading of selected literature. Guides students in learning writing as a process, understanding audience and purpose, exploring ideas of information, composing, revising, and editing. Supports writing by integrating experience in thinking, reading, listening, and speaking. Lecture 3 hours per week.

**Technical Writing***ENG 115 • 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.

## COURSE DESCRIPTIONS

**Survey of Mass Media***ENG 120 • 3 credits*

Examines radio, television, newspapers, magazines, books and motion pictures. Emphasizes the nature of change in, and the social implications of, communications media today. Lecture 3 hours per week.

**Introduction to Journalism I-II***ENG 121-122 • 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.

**Technical Report Writing I***ENG 131 • 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. Lecture 3 hours per week.

**Applied Grammar***ENG 135 • 3 credits*

Develops ability to edit and proofread correspondence and other documents typically produced in business and industry. Instructs the student in applying conventions of grammar, usage, punctuation, spelling, and mechanics. Lecture 3 hours per week.

**Advanced Composition***ENG 210 • 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.

**Creative Writing I-II***ENG 211-212 • 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.

**Introduction to the Short Story***ENG 236 • 3 credits*

Examines selected short stories emphasizing the history of the genre. Involves critical reading and writing. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**Introduction to Poetry***ENG 237 • 3 credits*

Examines selected poetry emphasizing the history of the genre. Involves critical reading and writing. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**Survey of American Literature I-II***ENG 241-242 • 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.

**Survey of English Literature I-II***ENG 243-244 • 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.

**Contemporary African-American Women Writers***ENG 248 • 3 credits*

Surveys the literary contributions made by contemporary African-American women. Examines the intellectual, social, cultural, psychological, and economic trends of the African-American experience. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**Survey of World Literature I-II***ENG 251-252 • 3 credits each*

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

**Survey of Afro-American Literature I-II***ENG 253-254 • 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.

**Literature of Science Fiction***ENG 256 • 3 credits*

Examines the literary and social aspects of science fiction, emphasizing development of ideas and techniques through the history of the genre. Involves critical reading and writing. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**Advanced Creative Writing I-II***ENG 261-262 • 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.

**The Modern Short Story***ENG 265 • 3 credits*

Studies the modern short story as a literary form. Emphasizes appreciation and interpretation of selected stories. Requires critical reading and writing. Prerequisite: ENG 112 or divisional approval. Lecture 3 hours per week.

**Southern Literature***ENG 276 • 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.

**Film and Literature***ENG 279 • 3 credits*

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

**Industrial Courses****Industrial Communication I***ENG 21 • 3-4 credits*

Improves basic writing skills, providing practice in organizing and writing basic forms of technical communications, and reviews grammatical usage and mechanics appropriate for technical writing. Offers practice in basic oral communication skills geared to industrial needs. Lecture 3-4 hours per week.

**Industrial Communication II***ENG 22 • 3-4 credits*

Builds on writing and oral communication skills introduced in ENG 21 but stresses more complex forms of technical communication geared to industrial needs. Lecture 3-4 hours per week.

**Industrial Communication III***ENG 23 • 3-4 credits*

Continuation of technical communication skills learned in ENG 21 and 22. Offers practice in more complex forms of technical communication. Concentrates on technical forms of communication designed to meet specific needs of a select group from business and industry. Lecture 3-4 hours per week.

## ENGLISH AS A SECOND LANGUAGE

### English as a Second Language II

*ESL 02 • 4 credits*

Provides intensive instruction and practice at the low intermediate level. Provides an introduction to the sound system, stress, and intonational 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. Lecture 4 hours per week.

### English as a Second Language: Reading I

*ESL 05 • 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. Lecture 4 hours per week.

### English as a Second Language:

#### Reading II

*ESL 06 • 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. Lecture 4 hours per week.

### Oral Communications I

*ESL 07 • 4 credits*

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

### Oral Communications II

*ESL 08 • 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. Lecture 4 hours per week.

### English as a Second Language:

#### Composition I

*ESL 11 • 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. Lecture 4 hours per week.

### English as a Second Language:

#### Composition II

*ESL 12 • 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. Lecture 4 hours per week.

### English as a Second Language: Composition III

*ESL 13 • 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. Lecture 4 hours per week.

### English as a Second Language: Oral and Written Communications I

*ESL 14 • 4 credits*

Provides practice in the sound, stress, intonation, structural patterns, grammar, vocabulary, and idioms of beginning-level English. Lecture 4 hours per week.

### English as a Second Language: Oral and Written Communications II

*ESL 15 • 4 credits*

Provides practice in the sound, stress, intonation, structural patterns, grammar, vocabulary, and idioms of intermediate-level English. Lecture 4 hours per week.

### English as a Second Language: Oral and Written Communications III

*ESL 16 • 4 credits*

Provides practice in the sound, stress, intonation, structural patterns, grammar, vocabulary, and idioms of advanced-level English with an emphasis on preparation for college-level English proficiency. Lecture 4 hours per week.

### English as a Second Language:

#### Reading III

*ESL 17 • 4 credits*

Helps students improve their reading comprehension and vocabulary development. Improves student's 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. Lecture 4 hours per week.

### English as a Second Language: Writing Workshop

*ESL 18 • 4 credits*

Provides an opportunity for further practice in intermediate and advanced writing techniques taught in required ESL writing courses. Provides reinforcement in writing skills, including composing, organizing, revising, and editing. Lecture 4 hours per week.

### English as a Second Language: Spelling and Vocabulary

*ESL 19 • 4 credits*

Provides individualized instruction and practice in sound-letter correspondences. Introduces students to basic spelling rules, word division, prefixes, roots, and suffixes. Helps students master vocabulary through an understanding of homonyms, confusing words, and Greek and Latin roots. Stresses using words in context. Lecture 4 hours per week.

### Business Writing for ESL Students

*ESL 20 • 3 credits*

Introduces students to basic forms of business writing, including memos, letters, instructions, and reports. Includes an emphasis on business language and style. Lecture 3 hours per week.

## ENVIRONMENTAL SCIENCE

### Basic Wastewater Licensure Review *ENV 40 • 1 credit*

Reviews materials which are normally associated with the Wastewater Treatment Plant Operator's Class IV or Class III level licensure examinations. Utilizes lecture, audio-visual, and workshop sessions to review required materials and to prepare the trainee to complete the wastewater operator examinations. Prerequisite: Divisional approval. Laboratory 2 hours per week.

### Basic Water Licensure Review *ENV 47 • 1 credit*

Reviews materials which are normally associated with the Water Treatment Plant Operator's Class IV or Class III level licensure examinations. Utilizes lecture, audio-visual, and workshop sessions to review the required materials and to prepare the trainee to successfully complete the water operator examinations. Prerequisite: Divisional approval. Laboratory 2 hours per week.

### Introduction to Environmental Technology I-II *ENV 101-102 • 3 credits each*

Introduces students to basic scientific principles. Includes fundamentals of biology, chemistry, physics, and geology. Course integrates scientific disciplines as they relate to environmental technology. Lecture 3 hours per week.

### Environmental Microbiology *ENV 108 • 3 credits*

Studies characteristics and activities of micro-organisms, showing their essential relation to diagnosis, treatment, and prevention of disease. Explores fundamentals of bacteriology, mycology, and industrial microbiology. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### Introduction to Water and Wastewater Treatment Tech *ENV 110 • 2-3 credits*

Provides entry-level students with a general overview of the entire water supply, treatment, and disposal system. Traces water supply from raw state through treatment, storage, distribution, use, waste collection, and discharge back to the environment. Covers aspects of water supply and wastewater treatment. Lecture 1-3 hours. Laboratory 0-6 hours. Total 1-7 hours per week.

### Principles of Water System Operation I-II *ENV 111-112 • 2 - 3 credits*

Studies sources, development, characteristics, and transmission as well as various water treatment techniques and process control and monitoring, water quality criteria and standards, and treatment plant and distribution system operations. Aids operators in preparing for the certification examination and in gaining an understanding of the actual unit processes utilized in water treatment. Lecture 1-2 hours. Laboratory 0-6 hours. Total 1-7 hours per week.

### Water Quality Analysis *ENV 114 • 1 credit*

Introduces drinking water standards, sample collection techniques, preservation equipment, and tests (microbiological, physical, and chemical). Lecture 1 hour per week.

### Water Purification *ENV 115 • 3 credits*

Explores principles of water purification including sedimentation, rapid sand filtration, chlorination, treatment, and prevention of disease. Studies fundamentals of bacteriology, mycology, and parasitology, emphasizing their relationships to community health. Includes soil, water, wastewater, and industrial microbiology. Lecture 2 hours per week.

### Facilities Planning for Environmental Safety Managers *ENV 125 • 3 credits*

Focuses on planning and operation of industrial facilities from the environmental safety perspective. Lecture 3 hours per week.

### Evaluating the Hazard Risk *ENV 126 • 3 credits*

Teaches entry procedures, attendance requirements, and personal protective equipment selection and use. Stresses the evaluation of entry risks. Meets the OSHA standards for employees and Commonwealth of Virginia 16 hour certification requirements. Lecture 3 hours per week.

### Advanced Wastewater Licensure Review *ENV 146 • 2 credits*

Reviews the materials associated with the Wastewater Treatment Plant Operator's Class II or Class I level certification examinations. Consists of lecture, audio-visual, and workshop sessions to review the required material and to prepare the trainee to complete the wastewater operator's examinations. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

### Advanced Water Licensure Review *ENV 147 • 1 credit*

The advanced licensure examination program is a workshop to review the additional materials associated with Water Treatment Plant Operator Class II or Class I level licensure examinations. The program consists of lecture, audio-visual, and workshop sessions to review the required material and to prepare the trainee to complete the water operator's examination. Prerequisite: Divisional approval. Laboratory 2 hours per week.

### Water And Wastewater Treatment Computational Operations *ENV 148 • 2 credits*

Studies the application of mathematical operations to the solution of treatment plant problems. Lecture 2 hours per week.

### Wastewater Treatment Plant Operation *ENV 149 • 3 credits*

Teaches principles, practices, and desired function and operation of a variety of wastewater treatment unit processes. Evaluates the operation of processes by determination of the information and testing required for evaluation and performing the subsequent necessary calculations. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### Environmental Chemistry I-II *ENV 181-182 • 4 credits each*

Teaches constituents about elements and classes of elements. Inorganic and organic compounds are introduced by family classes. Emphasis is given to toxicity, fire hazard, and health hazard, as well as safety considerations, which include heat transfer, temperature, vapor pressure, boiling point, flash point and ignition temperature. Lecture 4 hours per week.

### OSHA Hazardous Waste Operations and Response *ENV 183 • 3 credits*

Presents the OSHA Hazardous Waste Operations and Emergency Response regulations and how these standards are relevant to the protection of hazard waste workers. Certifies the students in the requirements of the OSHA Hazwoper program. Lecture 3 hours per week.

### Sampling Techniques *ENV 215 • 3 credits*

Covers laboratory analysis, equipment, laboratory skills, sampling methods, and data collection and interpretation. Includes class-

room and field work in the sampling of known and unknown substances. Prerequisite: SAF 175. Lecture 3 hours per week.

#### **Industrial Waste Treatment**

*ENV 217 • 3 credits*

Examines principles and methods of contemporary industrial waste treatment, relationships between the characteristics of industrial wastes and their effects on receiving waters, differences and similarities between industrial and sanitary waste treatment. Lecture 0-4 hours. Laboratory 0-12 hours. Total 1-12 hours per week.

#### **Environmental Problems**

*ENV 220 • 3 credits*

Studies the relationship of man to his environment; ecological principles, population dynamics, topics of current importance including air, water, and noise pollution; poisoning and toxicity, radiation, conservation and management of natural resources. Lecture 3 hours per week.

#### **Environmental Law**

*ENV 227 • 3 credits*

Introduces environmental law including the history of environmental laws, the National Environment Policy Act, state environmental acts, hazardous wastes, endangered species, pollution, and surface mine reclamation. Lecture 3 hours per week.

#### **Environmental Codes I**

*ENV 231 • 3 credits*

Introduces the regulations, their intent, interpretation of the Resources Conservation and Recovery Liability Act (RCRLA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and similar environmental legislation. Additionally, studies their impact on industry. Lecture 3 hours per week.

#### **Environmental Codes II**

*ENV 232 • 3 credits*

Studies the clean air and water legislation. Includes the regulations, their intent, interpretation, and impact on communities, business and industry. Lecture 3 hours per week.

## **FINANCIAL SERVICES**

### **Financial Management**

*FIN 215 • 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. by 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.

## **FIRE SCIENCE**

### **Introduction to Fire Science**

*FIR 100 • 3 credits*

Introduces basic concepts involved in fire suppression including fire behavior, building codes built-in protection systems and the life safety code. Discusses the history and philosophy of the fire service at the national, state, and local levels and analyzes the overall fire problem. Lecture 3 hours per week.

### **Fire Suppression Operations**

*FIR 105 • 3 credits*

Introduces the fundamentals of fire suppression. Explores fire behavior and basic physical and chemical laws of fire dynamics. The student will understand the quick operational decisions made on the fireground, including emergency incident management. Lecture 3 hours per week.

### **Hazardous Materials for Protective Services**

*FIR 110 • 4 credits*

Presents an overview of chemistry of hazardous materials including solids, liquids, gases and methods used in their identification. Examines the use, handling, transportation, medical and environmental problems associated with hazardous materials. Discusses methods and provides specific skills and techniques used by the emergency worker in the abatement of hazardous materials incidents. Also provides an overview of specific medical incidents and treatment modalities associated with hazardous materials exposures. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

### **Fire Prevention Fundamentals**

*FIR 116 • 3 credits*

Introduces fire safety through study of fire causes, inspections, investigation procedures, and life safety education. Familiarizes students with laws, ordinances, and codes which influence the field of fire prevention and related problems. Lecture 3 hours per week.

### **Methods of Instruction**

*FIR 135 • 3 credits*

Emphasizes development of teaching methods and aids, including role-playing, small group discussion and development of individual learning methods and materials. Requires students to develop lesson plans and make presentations on appropriate topics. Meets requirements for certification as listed NFPP 1041 "Level II" instructor, as well as appropriate "Level III" State of Virginia Fire Training Program requirements. Lecture 3 hours per week.

### **Fire Officer I**

*FIR 140 • 4 credits*

Presents a basic course to help individuals develop skills needed to supervise and direct personnel, and manage resources at the company level; and is based on the current requirements of NFPA 1021, Standards for Fire Officer Professional Qualifications. Prepares students for certification as Fire Officer I. Lecture 4 hours per week.

### **Fire Hydraulics and Distribution Systems**

*FIR 205 • 4 credits*

Teaches mathematics, laws and formulas as applied to fire service hydraulics, including the development of mental ability to solve fire flow requirements and water supply needs. Emphasizes the principles, techniques, and application of water distribution systems used for fire suppression. Prerequisite: MTH 121 or higher. Lecture 4 hours per week.

### **Building Construction**

*FIR 220 • 3 credits*

Teaches various types of construction materials and their properties with emphasis on the effect of heat, water, and internal pressure generated under fire conditions. Familiarizes students with national, state, and local ordinances and codes which influence fire safety. Lecture 3 hours per week.

### **Investigation Procedures**

*FIR 230 • 3 credits*

Introduces the development and philosophy of fire investigation and detection, including inspection techniques, gathering of evidence and development of a criminal procedure to conform to judicial requirements. Lecture 3 hours per week.

## COURSE DESCRIPTIONS

### Emergency Incident Management

*FIR 234 • 3 credits*

Teaches concepts, principles and processes of unified incident management concepts and medical triage for fire and emergency medical services systems. Applies modern management techniques designed for the mitigation of fire, rescue and emergency medical services incidents. Includes the study of coordinating complex emergency operations within a dynamic system designed to command and control all elements involving fire suppression, medical incidents, multi-agency operations and mass casualty situations. Prerequisites: FIR 105 or EMT 105. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

### Emergency Services Administration

*FIR 238 • 3 credits*

Provides an overview of management and administration methods and procedures in fire service and emergency medical services organizations. Includes ethical and legal considerations, budget preparation, records management, public relations, conflict resolution, intergovernmental relationships, cultural diversity, and personnel management issues. Discusses managerial attitudes and decisions, general and strategic organizational planning and career development. Lecture 3 hours per week.

### Fire Suppression Systems and Equipment

*FIR 256 • 3 credits*

Covers the examination and utilization of portable extinguishers, standpipe systems, sprinkler systems, foam systems, carbon dioxide systems, dry chemical systems, halogenated agent systems, explosion suppression systems, and other specialized hazard suppression systems. May include field trips to evaluate various system installations and operations as they relate to property protection and fire department operations. Lecture 3 hours per week.

### Cooperative Education in Fire Science

*FIR 297 • 1-5 credits*

Supervised on-the-job training in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

## FRENCH

### Beginning French I-II

*FRE 101-102 • 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.

### Intermediate French I-II

*FRE 203-204 • 3 credits each*

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

## GEOGRAPHY

### People and the Land: An Introduction to Cultural Geography

*GEO 210 • 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.

### World Regional Geography

*GEO 220 • 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.

### Economic Geography

*GEO 225 • 3 credits*

Familiarizes the student with the various economic, geographic, political and demographic factors that affect international target markets and trade activities. Lecture 3 hours per week.

### Political Geography

*GEO 230 • 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.

## GENERAL USAGE COURSES

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

### Coordinated Internship In

*90-190-290 • 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.

### Studies In

*93-193-293 • 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.

### Topics In

*95-195-295 • 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.

### On-Site Training In

*96-196-296 • 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.

### Cooperative Education In

*97-197-297 • 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.

### Seminar and Project In

*98-198-298 • 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.

**Supervised Study In \_\_\_\_\_***99-199-299 • 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.

**GEOPHYSICAL SCIENCES****Physical Geology***GOL 105 • 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.

**Historical Geology***GOL 106 • 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.

**Earth Science for Non-Science Majors***GOL 110 • 4 credits*

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

**Oceanography I-II***GOL 111-112 • 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.

**Environmental Geology***GOL 225 • 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.

**GEOGRAPHICAL INFORMATION SYSTEMS****Geographical Information Systems I***GIS 200 • 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: IST 117 or instructor approval. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Geographical Information Systems II***GIS 201 • 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.

**GERMAN****Beginning German I-II***GER 101-102 • 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.

**Intermediate German I-II***GER 203-204 • 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.

**HEALTH****First Aid and Cardiopulmonary Resuscitation***HLT 100 • 3 credits*

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

**Cardiopulmonary Resuscitation***HLT 105 • 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.

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

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

**Environmental First Aid and CPR***HLT 108 • 2-3 credits*

Teaches the principles and techniques of safety, first aid, and CPR for environmental emergency workers who are wearing breathing apparatus and protective suits when injured. Includes methods of decontamination so that the injured may be accepted by rescue squads and hospitals. Lecture 2-3 hours per week.

**Concepts of Personal and Community Health***HLT 110 • 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.

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

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.

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

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

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

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

**Child Health and Nutrition***HLT 135 • 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.

## COURSE DESCRIPTIONS

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

Provides an understanding of medical abbreviations and terms. Includes the study of prefixes, 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.

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

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

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

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

**Sex Roles in Contemporary America***HLT 205 • 3 credits*

Explores the changing roles of the sexes that have occurred from 1900 to the present. Includes sexual and social mores, inhibitions towards sexuality, and the influence of society and religion. Discusses psychological and emotional implications regarding sexuality for males and females and how to deal with them. Lecture 3 hours per week.

**Personal Stress and Stress Management***HLT 215 • 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.

**Concepts of Disease***HLT 220 • 3 credits*

Emphasizes general principles, classifications, causes, and treatments of selected disease processes. Intended primarily for students enrolled in health technology programs. Lecture 3 hours per week.

**AIDS Awareness***HLT 226 • 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.

**Principles of Nutrition and Human Development***HLT 230 • 3 credits*

Teaches the relationship between nutrition and human development. Emphasizes nutrients, balanced diet, weight control, and the nutritional needs of an individual. Lecture 3 hours per week.

**Health and Well-Being of the Older Adult***HLT 270 • 3 credits*

Focuses on the health of the older adult, teaches health promotion, preventive health techniques and accident prevention. Lecture 3 hours. Total 3 hours per week.

**Physical Care Management of the Older Adult***HLT 271 • 3 credits*

Introduces physiology of aging, integrates caretaker guidelines, demonstrates skills to care for aging at a variety of functional levels. Lecture 3 hours. Total 3 hours per week.

**Medical Management of the Older Adult***HLT 272 • 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. Lecture 3 hours. Total 3 hours per week.

**HEALTH INFORMATION TECHNOLOGY****Health Information Technology I***HIT 101 • 4 credits*

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

**Health Information Technology II***HIT 103 • 2 credits*

Introduces principles of data quality and validation types and uses of health registers. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Introduction to Human Pathology***HIT 110 • 3 credits*

Introduces the basic concepts, terminology, etiology, and characteristics of pathological processes. Prerequisites: BIO 142 and HLT 143. Lecture 3 hours per week.

**Medical Transcription I-II***HIT 121-122 • 4 credits each*

Develops skill in the transcription and preparation of reports for the medical record and in the operation and care of dictating and transcribing equipment. Prerequisite: HLT 143 and ability to type 55 words per minute. Lecture 1 hour. Laboratory 6 hours. Total 7 hours per week.

**Medical Transcription In Health Information Technology***HIT 128 • 1 credit*

Introduces the student to basic word processing and equipment components. Provides information on applications of word processing in the health information department. Introduces transcription of various medical reports and policies for operating an efficient transcription department. Laboratory 2 hours per week.

**Anatomy and Physiology for Medical Transcriptionists***HIT 163 • 3 credits*

Introduces the structure and function of the system of the human body as applied in the medical transcription profession. Prerequisite: HLT 143. Lecture 3 hours per week.

**Basic Pharmacology for Medical Transcriptionists***HIT 164 • 3 credits*

Introduces the basic concepts and terminology of drug structures, functions, interactions, and administrations as applied in the medical transcription profession. Prerequisite: HLT 143. Lecture 3 hours per week.

**Coordinated Internship***HIT 190 • 1-2 credits*

Includes supervised practice in selected health agencies coordinated by the college. Credit/practice ratio maximum 1:5 hours. May be repeated for credit. Variable hours per week.

**Health Statistics***HIT 220 • 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. Lecture 2 hours per week.

#### Legal Aspects of Health Record Documentation

*HIT 226 • 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.

#### Accreditation Standards in Health Information Technology

*HIT 228 • 1 credit*

Focuses on health standards and accrediting procedures required by health agencies with emphasis on the Joint Commission on Accreditation of Healthcare Organizations. Laboratory 2 hours per week.

#### Performance Improvement in Health Care Settings

*HIT 229 • 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.

#### Information Systems and Technology in Healthcare

*HIT 230 • 3 credits*

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

#### Supervision and Management Practices

*HIT 249 • 3 credits*

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

#### Health Records Coding

*HIT 253 • 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.

#### Advanced Coding and Reimbursement

*HIT 254 • 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.

#### Pharmacology for Health Information Technology

*HIT 260 • 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.

#### Coordinated Internship

*HIT 290 • 2-5 credits*

Includes supervised practice in selected health agencies coordinated by the college. Credit/practice ratio maximum 1:5 hours. May be repeated for credit. Variable hours per week.

## HISTORY

#### History of Western Civilization I-II

*HIS 101-102 • 3 credits each*

Examines the development of western civilization from ancient times to the present. The first semester ends with the seventeenth century; the second semester continues through modern times. Lecture 3 hours per week.

#### History of World Civilization I-II

*HIS 111-112 • 3 credits each*

Surveys Asian, African, Latin American, and European civilizations from the ancient period to the present. Lecture 3 hours per week.

#### United States History I-II

*HIS 121-122 • 3 credits each*

Surveys United States history from its beginning to the present. Lecture 3 hours per week.

#### African-American History I-II

*HIS 141-142 • 3 credits each*

Surveys the history of black Americans from their African origins to the present. Lecture 3 hours per week.

#### Life in Colonial Virginia

*HIS 155 • 3 credits*

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

#### History of England

*HIS 211 • 3 credits*

Surveys the history of the British Isles from pre-Celtic times to the present. Lecture 3 hours per week.

#### History of Modern Europe I-II

*HIS 221-222 • 3 credits each*

Examines political, social, cultural, and economic developments from the Renaissance to the present. Lecture 3 hours per week.

#### History of Chinese Culture and Institutions

*HIS 255 • 3 credits*

Examines traditional Chinese social, political, economic, and military institutions. Also examines major literary, artistic and intellectual achievements from pre-historic times to the present. Lecture 3 hours per week.

#### Topics in United States History I-II

*HIS 261-262 • 3 credits*

Examines selected topics in United States history which shaped the American experience. Lecture 3 hours per week.

#### History of the Old South

*HIS 265 • 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.

#### Civil War and Reconstruction

*HIS 269 • 3 credits*

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

## HORTICULTURE

#### Practical Horticulture

*HRT 106 • 1 credit*

Provides practical experience in landscape construction and equipment operations and maintenance. Laboratory 2 hours per week.

#### Principles of Horticulture

*HRT 110 • 3 credits*

Introduces concepts of plant growth and development. Covers horticultural practices, crops and environmental factors affecting plant growth. Lecture 3 hours per week.

## COURSE DESCRIPTIONS

**Plant Propagation***HRT 115 • 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.

**Irrigation Systems for Turf and Ornamentals***HRT 119 • 3 credits*

Explains why, when, and how irrigation systems are used by the grounds management industry. Includes component selection, system design, installation, operation, and maintenance. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Greenhouse Crop Production I-II***HRT 121-122 • 3 credits each*

Examines commercial practices related to production of floricultural crops. Considers production requirements, environmental control and management, and cultural techniques affecting production of seasonal crops. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Chemicals in Horticulture***HRT 125 • 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.

**Home Landscaping***HRT 126 • 3 credits*

Studies current approaches to improving home landscapes. Emphasizes planning, proper implementation, and landscape maintenance. Lecture 3 hours per week.

**Horticultural Botany***HRT 127 • 3 credits*

Studies taxonomy, anatomy, morphology, physiology, and genetics of plants as applied to identification, propagation and culture. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Theory of Landscape Design***HRT 150 • 3 credits*

Presents the theoretical aspects of landscape planning and design. Uses theory to analyze and solve design problems. Lecture 3 hours per week.

**Landscape Plants I-II***HRT 201-202 • 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.

**Soils***HRT 205 • 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. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Plant Pest Management***HRT 207 • 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.

**Nursery and Garden Center Management***HRT 225 • 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, produce selection, marketing, merchandising, and display. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Greenhouse Management***HRT 226 • 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.

**Professional Landscape Management***HRT 227 • 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.

**Turfgrass Management I***HRT 228 • 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, top dressing, and mowing frequency and height. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Turfgrass Management II***HRT 229 • 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. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Planting Design I***HRT 231 • 3 credits*

Applies landscape theory and principles of drawing to the planning of residential and small scale commercial landscape designs. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Landscape Drawing***HRT 235 • 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.

**Construction of Golf Courses and Athletic Fields***HRT 237 • 3 credits*

Provides in-depth knowledge and expertise in handling the critical tasks of construction recreational turfgrass facilities. Introduces concepts of design, drainage, irrigation, and soil configuration. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Principles of Weed Science***HRT 240 • 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.

#### Indoor Plants

*HRT 247 • 2 credits*

Studies identification, culture, and uses of indoor plants in interior landscaping. Includes tropical, subtropical, and non-hardy temperate plants. Teaches scientific and common names of plants. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

#### Arboriculture

*HRT 259 • 3 credits*

Studies the techniques of tree care. Covers surgery, pruning, insect and disease recognition and control, fertilization, cabling, and lightning rod installation. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

#### Introduction to Floral Design

*HRT 260 • 3 credits*

Teaches skills required for the composition of basic table arrangements. Includes the history of design styles, identification of flowers and greens, identification and use of equipment, and conditioning and handling of flowers. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

#### Professional Floral Design and Shop Management

*HRT 265 • 3 credits*

Studies location, management, and operation of a retail florist. Includes ordering, telemarketing, account handling, advertising, and marketing. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

#### Advanced Floral Design

*HRT 266 • 3 credits*

Teaches skills required for composition of traditional floral designs and contemporary floral designs. Includes use of exotic florals to create arrangement styles such as Japanese, European, Williamsburg, etc. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

#### Professional Turf Care

*HRT 269 • 3 credits*

Covers turfgrass identification, selection, culture, propagation, and pest control. Surveys commercial turf care operation, and use of common equipment. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

#### Landscape Construction and Maintenance

*HRT 275 • 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.

#### Cooperative Education in Horticulture

*HRT 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

### HOTEL-RESTAURANT- INSTITUTIONAL MANAGEMENT

#### Hotel-Restaurant Organization and Management I-II

*HRI 101-102 • 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.

#### Introduction to Culinary Arts

*HRI 105 • 1 credit*

Covers the historical perspective of the cooking and hospitality industry. Includes career paths and opportunities for culinarians, culinary professionalism, people skills, motivational and organizational skills. Lecture 1 hour per week.

#### Principles of Food Preparation

*HRI 120 • 4 credits*

Applies scientific principles and techniques to the preparation of food, including carbohydrates, such as fruits, vegetables, sugars and starches; fats, including both animal and vegetable, as well as natural and manufactured; and proteins, such as milk, cheese, eggs, meats, legumes, fish and shellfish. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

#### Principles of Baking

*HRI 128 • 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 pre-

pare baked items, pastries and confections. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

#### Garde Manger

*HRI 145 • 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.

#### Introduction to Hospitality Ownership

*HRI 150 • 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.

#### Sanitation and Safety

*HRI 158 • 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 foodborne illnesses in conformity with federal, state and local guidelines. Focuses on OSHA standards in assuring safe working conditions. Lecture 3 hours per week.

#### Executive Housekeeping

*HRI 160 • 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.

#### Convention Management and Service

*HRI 180 • 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.

#### Fundamentals of Wine

*HRI 205 • 3 credits*

Familiarizes the student with basic knowledge needed to make decisions relative to the purchase, storage, and service of wine,

## COURSE DESCRIPTIONS

as well as decisions relative to the use of wine in the hospitality and food service industry. Lecture 3 hours per week.

#### International Cuisine

*HRI 206 • 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.

#### American Regional Cuisine

*HRI 207 • 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.

#### Food Purchasing

*HRI 215 • 3 credits*

Presents the methods 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.

#### Stock, Soup, and Sauce Preparation

*HRI 219 • 3 credits*

Instructs the student in the preparation of stocks, soups, and sauces. Promotes the knowledge/skills to prepare stocks, soups, and sauces, and to select appropriate uses as meal components. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

#### Meat, Seafood, and Poultry Preparation

*HRI 220 • 3 credits*

Provides the study and preparation of meat, poultry, shellfish, fish, and game. Promotes the knowledge/skills required to select appropriate use of these foods as meal components. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

#### Menu Planning and Dining Room Service

*HRI 225 • 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.

#### Marketing of Hospitality Services

*HRI 235 • 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.

#### Food and Beverage Cost Control I

*HRI 251 • 3 credits*

Presents methods of pre-cost and pre-control as applied to the menu, purchasing, receiving, storing, issuing, production, sales and service which results in achievement of an operation's profit potential. Emphasizes both manual and computerized approaches. Prerequisite: MTH 121 or equivalent. Lecture 3 hours per week.

#### Human Resources Management and Training for Hospitality and Tourism

*HRI 255 • 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 evaluates tools to improve productivity. Emphasizes staff and customer relations. Lecture 3 hours per week.

#### Principles and Applications of Catering

*HRI 256 • 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.

#### Hotel Front Office Operations

*HRI 265 • 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.

#### Hospitality Law

*HRI 275 • 3 credits*

Studies the laws applicable to the ownership and operation of food and lodging operations. Includes duties to guests, ejection of undesirables, liabilities for personal injuries, damage, arrest and detention of offenders. Lecture 3 hours per week.

#### Coordinated Internship in Culinary Arts

*HRI 290 • 1-5 credits*

Supervised on-the-job training in selected business, industrial, or service firms coordinated by the College. Credit/practice ratio maximum 1:5 hours. May be repeated for credit. Variable hours per week.

#### Cooperative Education in Hotel-Restaurant-Institutional Management

*HRI 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

## HUMANITIES

#### Survey of Western Culture I

*HUM 201 • 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.

#### Survey of Western Culture II

*HUM 202 • 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.

#### Media Aesthetics

*HUM 205 • 3 credits*

Teaches the aesthetic principles of visual media production, concentrating on visual and aural literacy. Lays the foundation for creators of productions to convey messages and sto-

ries effectively and for viewers of media to appreciate and to evaluate critically their media experiences. Lecture 3 hours per week.

### **Introduction to Women's Studies**

*HUM 210 • 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 112. Lecture 3 hours per week.

### **Survey of American Culture I-II**

*HUM 211-212 • 3 credits each*

Examines elements of our national culture as they evolved from the first European explorations through colonization and independence to the present day. Lecture 3 hours per week.

### **Introduction to African-American Studies**

*HUM 220 • 3 credits*

This interdisciplinary approach to the study of African-American life, history, and culture. Students will examine the specific events, ideologies, and individuals that have shaped the contours of African-American life. In studying the history, sociology, economics, religion, politics, psychology, creative productions, and culture of African-Americans, we hope to better understand the internal dynamics of life in America and how African-American life has had a great impact on white America. Lecture 3 hours per week.

### **Survey of Filipino Culture I-II**

*HUM 233-234 • 3 credits each*

Surveys the cultural history of the Philippines from pre-Spanish settlement through the contemporary world. Studies cultural, political, social, and economic life including art, literature, and music. Lecture 3 hours per week.

### **Filipino-American Culture**

*HUM 235 • 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.

### **Principles of the Humanities I-II**

*HUM 241-242 • 3 credits each*

Integrates unifying principles of the humanities and related fields of study. Emphasizes the expansion of the student's intellectual perspective and development of concepts en-

abling the integration of knowledge from diverse fields into a unified whole. Lecture 3 hours per week.

### **Creative Thinking**

*HUM 246 • 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.

### **Chronicles of the Sea**

*HUM 247 • 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.

### **Mythology in Literature and the Arts**

*HUM 256 • 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.

### **Survey of Twentieth-Century Culture**

*HUM 260 • 3 credits*

Explores literature, visual arts, philosophy, music, and history of our time from an interdisciplinary perspective. Lecture 3 hours per week.

## **HUMAN SERVICES**

### **Activities with the Geriatric Client**

*HMS 138 • 3 credits*

Introduces the student to the activities profession. The course indicates state and federal regulations and associates standards of practice. Concepts of human development in later life are also presented. Lecture 3 hours per week.

### **Activities Documentation and Programming in Long Term Care**

*HMS 150 • 3 credits*

Introduces the student to the documentation process in long term care which serves as the foundation for developing quality activity programs designed to meet the needs of the clients. Lecture 3 hours per week.

### **Coordinated Internship**

*HMS 190 • 1-5 credits*

Includes supervised practice in selected health agencies coordinated by the college. Credit/practice ratio maximum 1:5 hours. May be repeated for credit. Variable hours per week.

### **Gerontology I**

*HMS 231 • 3 credits*

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.

### **Psychological and Sociological Aspects of Older Adult Care**

*HMS 233 • 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.

### **Managing Senior Adult Activity Programs**

*HMS 234 • 3 credits*

Prepares the activity professional to develop and implement an activity program for clients in a long term care facility. Course includes management techniques, policy and procedure development, and procedures for the evaluation of an activity program in a long term care facility. Lecture 3 hours per week.

### **Administration of Activity Departments in Long Term Care**

*HMS 276 • 3 credits*

Prepares the student to fulfill the administrative role of the activity manager and director. The course includes personnel management, financial management, and the development of a marketing plan for the department. Lecture 3 hours per week.

## **INDUSTRIAL ENGINEERING TECHNOLOGY**

### **Quality Assurance Technology I-II**

*IND 101-102 • 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

## COURSE DESCRIPTIONS

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.

#### **Nondestructive Inspection (NDI) and Testing**

*IND 105 • 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.

#### **Industrial Engineering Technology**

*IND 106 • 3 credits*

Introduces basic skills required for a career in industrial engineering technology. May include basic statistics for engineering technicians, the SI system, graphic analysis, and careers as an engineering technician. Lecture 3 hours per week.

#### **Force, Mass, & Torque Measurement**

*IND 109 • 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.

#### **Materials and Processes of Industry**

*IND 115 • 4 credits*

Studies industrial/engineering material and contemporary processes for the manufacture of products. Investigates the material's nature, structure and properties. Examines the processes and their effects on materials. Lecture 4 hours per week.

#### **Industrial Supervision I**

*IND 121 • 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.

#### **Industrial Supervision II**

*IND 122 • 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.

#### **Standards of Quality and Auditing**

*IND 135 • 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.

#### **Quality by Design**

*IND 136 • 3 credits*

Presents a comprehensive approach to planning, setting, and reaching quality goals. Explores the major economic sectors of service, manufacturing, and support. Provides a practical plan to achieve strategic market-driven goals by following a structured approach to planning quality and product development. Lecture 3 hours per week.

#### **Team Concepts and Problem Solving**

*IND 137 • 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.

#### **Introduction to Metrology**

*IND 145 • 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.

#### **Statistical Quality Control**

*IND 146 • 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 variable and distribution probabilities. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

#### **Industrial Management**

*IND 150 • 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.

#### **Precision Dimensional Measurement**

*IND 159 • 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.

#### **Introduction to Robotics**

*IND 160 • 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.

**Principles of Industrial Technology I***IND 165 • 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.

**Pressure Measurement***IND 175 • 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.

**World Class Manufacturing I***IND 181 • 3 credits*

Studies the principles and applications of the globalization of industry. Emphasizes the fundamentals of interpersonal/team process, organization skills, total quality tools for continuous improvement, statistical process control, manufacturing resource planning and just-in-time. Lecture 3 hours per week.

**Temperature and Humidity Measurement***IND 203 • 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 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.

**Opto-Mechanical Measurement of****Angles and Surfaces***IND 204 • 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 angles 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.

**Flow, Viscosity, and Specific Gravity Measurement***IND 205 • 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.

**Plant Layout and Materials Handling***IND 216 • 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.

**Production Planning***IND 225 • 3 credits*

Studies fundamentals of production planning and control. May include preparation for an analysis of production, forecasting, operation, planning, scheduling, and dispatching using modern techniques. Lecture 3 hours per week.

**Total Quality Concepts***IND 236 • 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 approaches to Total Quality philosophy. Lecture 3 hours per week.

**Fundamentals of ISO 9000***IND 237 • 3 credits*

Presents the basics of ISO 9000 standards. Focuses on the latest improvements of the standards and 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 system certification. Discusses implementation approaches. Lecture 3 hours per week.

**Industrial Tours***IND 238 • 3 credits*

This course provides the students an opportunity to observe and enhance their knowledge of representative manufacturing industries in the local region. Emphasis is on observing and understanding leading edge manufacturing technology and methodology, quality practices and programs, and safety practices and programs utilized at the manufacturer's sites. Lecture 3 hours per week.

**Time and Motion Study***IND 245 • 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.

**Automated Manufacturing Systems I***IND 251 • 3 credits*

Presents basic principles used in the design and implementation of manufacturing work cells. Includes selection of the robot system, worksite, application cell sensors, development of cycle times, and economic analysis. Prerequisite: IND 160. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Cooperative Education in Industrial Management***IND 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**INFORMATION SYSTEMS TECHNOLOGY****Introduction to Microcomputers***IST 102 • 1 credit*

Examines concepts and terminology related to microcomputers. Introduces the specific uses of microcomputers. Lecture 1 hour per week.

## COURSE DESCRIPTIONS

**Operating System and Software Utilities I***IST 104 • 1 credit*

Teaches commonly used internal and external commands including use of subdirectories and creating basic batch files. Lecture 1 hour per week.

**Microcomputer Operating Systems***IST 106 • 4 credits*

Teaches use of operating system utilities and multiple-level directory structures, creation of batch files, and configuration of microcomputer environment. May include a study of graphical user interfaces. Prerequisite: IST 117. Lecture 4 hours per week.

**Operating Systems: UNIX***IST 108 • 4 credits*

Provides an introduction to UNIX operating system. Teaches log-in procedures, file creation, UNIX file structure, input/output controls, and the UNIX shell. Lecture 4 hours per week.

**Microcomputer Software: Beginning Windows***IST 110 • 1 credit*

Provides first-time users with sufficient information to make practical use of the Windows software package. Presents the basics of many of the features and applications included in the Windows package. Lecture 1 hour per week.

**Fundamentals of Computer Information Systems***IST 114 • 4 credits*

Provides a technical approach to concepts and terminology of computer information systems. Includes the study of computer information systems: hardware, software, functions, capabilities, and limitations of computer systems. Exposes students to techniques used in programming and system development. Prerequisite: MTH 04 and IST 117. Lecture 4 hours per week.

**Introduction to Microcomputer Software***IST 117 • 4 credits*

Provides a working introduction to microcomputer software, fundamentals, and applications. Includes operating systems, word processing, spreadsheet, and database software. Lecture 4 hours per week.

**Microcomputer Software:****Spreadsheets I***IST 120 • 1 credit*

Provides first-time users with sufficient information to make practical use of spreadsheet software. Presents basics of building spreadsheets. Lecture 1 hour per week.

**Spreadsheet Software I***IST 123 • 4 credits*

Provides a working knowledge of a commercial spreadsheet package to include designing a variety of worksheets, preparing graphs, working with database query, macro writing, and menu techniques. Prerequisite: IST 117 or equivalent. Lecture 4 hours per week.

**Survey of Internet Services***IST 127 • 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.

**Introduction to Internet Services***IST 128 • 4 credits*

Provides students with a working knowledge of Internet terminology and services including e-mail, WWW browsing, search engines, ftp, telnet, and other services. Introduces web page construction with pages generated by web page editors and application software. Prerequisite: IST 117. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Microcomputer Software: Database Management I***IST 130 • 1 credit*

Provides first-time users with sufficient information to make practical use of database management software. Presents basics of building a database. Covers specific business applications. Lecture 1 hour per week.

**Database Management Software***IST 133 • 4 credits*

Provides a working introduction to software for database management. Teaches planning, defining, and using a database; performing queries; producing reports; working with multiple files; and concepts of database programming. Offers a working knowledge of a commercial database package. Prerequisite: IST 117 or equivalent. Lecture 4 hours per week.

**Microcomputer Integrated Software***IST 139 • 4 credits*

Provides a working introduction to integrated software for microcomputers. Teaches integration of spreadsheet, database management,

word processing and telecommunication software. Prerequisite: IST 117 or equivalent. Lecture 4 hours per week.

**Introduction to SQL***IST 148 • 4 credits*

Provides a working introduction to commands, functions, and operators used in SQL. Creates blocks of application codes that can be shared by multiple forms, reports, and data management applications. Prerequisites: IST 114 and IST 117. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Java Programming I***IST 149 • 4 credits*

Teaches the solution of programming problems using the java language. Prerequisite: IST 114. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Operations and Facilities of Mid-Range Computers***IST 155 • 4 credits*

Introduces students to the architecture and operation of a mid-range computer system. Covers workstation access, displays, system support, work management, initialization, and configuration. Includes concepts of objects, physical and logical files. Introduces use of Program Development Manager (PDM), Source Entry Utility (SEU), Screen Design Aid (SDA), Data Description Specifications (DDS), Screen Design Aid (SDA), Query/400 and Control Language (CL). Covers copy file functions, save/restore, journaling, and security. Is designed to teach the basics of operation of a mid-range computer and its facilities. Prerequisite: IST 117. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Basic Control Language Programming***IST 159 • 2 credits*

Introduces students to Control Language (CL). Topics include purpose and advantages of CL; structure of CL programs, working with CL variables, program flow commands; basic error handling; passing parameters; and commands to work with files and data areas. Includes CL for specific computer systems. Prerequisite: IST 155. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Computer Programming: COBOL I**  
*IST 162 • 4 credits*

Teaches writing COBOL programs from stated problems or specifications, applying structured programming methods to develop working software that meets specifications. Provides specific skills for modifying existing programs. Prerequisite: IST 114 or equivalent. Lecture 4 hours per week.

**Computer Programming: RPG**  
*IST 168 • 4 credits*

Teaches writing RPG programs from stated problems or specifications, applying structured programming methods to develop working software that meets specifications. Provides specific skills for modifying existing programs. Prerequisite: IST 114 or equivalent. Lecture 4 hours per week.

**Computer Programming: ADA**  
*IST 170 • 4 credits*

Teaches writing ADA programs from stated problems of specifications, applying structured programming methods to develop working software that meets specifications. Provides specific skills for modifying existing programs. Prerequisite: IST 114 or equivalent. Lecture 4 hours per week.

**Computer Programming: "C"**  
*IST 172 • 4 credits*

Teaches writing "C" programs from stated problems or specifications, applying structured programming methods to develop working software that meets specifications. Provides specific skills for modifying existing programs. Prerequisite: IST 114 or equivalent. Lecture 4 hours per week.

**Event-Driven BASIC I**  
*IST 176 • 4 credits*

Teaches writing BASIC programs in an event-driven environment from stated problems or specifications applying graphical user interface techniques to develop working software that meets specifications. Provides specific skills to create, modify, and debug applications. Prerequisite: IST 114. Lecture 4 hours per week.

**Introduction to Information Systems for the Legal Assistant**  
*IST 184 • 3 credits*

Provides an understanding of the terminology and concepts of computer-based systems. Introduces students to operating systems and application software to provide them with the

experience of using a microcomputer for legal research and litigation and to other application programs traditionally used in the practice of law. Lecture 3 hours per week.

**Local Area Networks**  
*IST 200 • 4 credits*

Teaches network topologies, protocols, network components, cabling, network operating systems, directories, security, printing, data backup, installation of file servers, workstations and applications. Prerequisites: IST 106 and IST 216. Lecture 4 hours per week.

**Administration of Local Area Networks**  
*IST 203 • 4 credits*

Focuses on the management of LAN file, print, and communications server activity emphasizing up-time and system backup. Teaches proper structuring of security system. Explains print queues, disk management, and other LAN issues. Presents concerns and issues for the purchase and installation of hardware and software upgrades. Prerequisite: IST 106. Lecture 4 hours per week.

**Networking Servicing**  
*IST 206 • 4 credits*

Focuses on servicing and maintaining local area networks (LANs). Teaches network installation, basic network troubleshooting, installation of file servers and workstations, upgrading of network software, configuring of network boards and cables, and diagnosing common network problems. As part of a networking curriculum, presents some of the material needed for network engineer certification. Corequisite: IST 207 may be required. Prerequisite: IST 203. Lecture 4 hours per week.

**Network Servicing Laboratory**  
*IST 207 • 1 credit*

Provides problem-solving experience to supplement instruction in IST 206. Should be taken concurrently with IST 206, in appropriate curricula, as identified by the College. Laboratory 2 hours per week.

**Advanced Concepts in Mid-Range Computing**  
*IST 209 • 4 credits*

Continues covering concepts and capabilities of data communications and networking on mid-range systems, types, and uses of integrated business-based applications, and basic business terminology. Discusses emerging technologies as it relates to specific systems. Includes a termination project. Prerequisites: IST 268 and

IST 282. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Network Design and Implementation**  
*IST 210 • 4 credits*

Introduces necessary skills to create an NDS design and implementation strategy. Illustrates the use of templates that may be re-used in the work environment. Provides hands-on laboratory practices for the use of these strategies and schedules to complete a network implementation. Teaches processes for creating a solid network design that have been proven in use with commercial consulting services. Teaches and provides laboratory experience for integration of a variety of products for administering and managing workstations, servers, and network-based applications in a mixed network environment. Presents materials to integrate NT and NetWare into the same environment. Prerequisites: IST 206 and IST 207. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Personal Computer Hardware Troubleshooting**  
*IST 216 • 4 credits*

Identifies the functions of PC components, and how to diagnose problems with these components and fix them. Teaches how to disassemble and reassemble the PC, how to replace or upgrade components and how to add peripherals such as printers, modems, and scanners. Studies hardware preventive maintenance and troubleshooting techniques. Prerequisite: IST 117. Lecture 4 hours per week.

**Microcomputer: Operating Systems, Architecture, and Hardware**  
*IST 220 • 4 credits*

Focuses on microcomputer operating systems, architecture, internal functions, and peripheral equipment interfaces. Teaches memory management, instruction and data formats, basic operating system architecture, and interaction with user software. Prerequisite: IST 106. Lecture 4 hours per week.

**Web Page Development and Scripting**  
*IST 223 • 4 credits*

Designed to provide in-depth knowledge of appropriate tools and information required to effectively create a Web page on the World Wide Web. Covers HTML and Scripting language. Prerequisite: IST 128. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

## COURSE DESCRIPTIONS

**Web Server Management***IST 224 • 4 credits*

Focuses on Web server as the workhorse of the World Wide Web (WWW). Teaches how to set up and maintain a Web server. Provides in-depth knowledge of Web server operations and provides hand-on experience in installation and maintenance of a Web server. Using several Web servers, course will show the part a Web server plays in the field of e-commerce. Prerequisites: IST 223 and IST 200. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Microcomputer Applications***IST 230 • 4 credits*

Uses previously mastered spreadsheet, database and graphics software to develop practical computerized solutions to common microcomputer information processing problems. Prerequisites: IST 139 and IST 176. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Database Management***IST 232 • 4 credits*

Focuses on basic models and capabilities of standard database management systems packages DBMS. Teaches database principles, file-level models, data-level models, operation implementation, maintenance, and security of database systems. Covers methods of DBMS selection and evaluation. Uses Query/400 and SQL. Prerequisites: IST 159 and IST 168. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Database Management and File Structure***IST 234 • 4 credits*

Introduces the theory and use of database management systems in business. Teaches how to access a database using a query language, how to design and create a database using the College's database management system, and how to write a program in a high-level language that accesses a database. Presents a study of sequential, relative, and indexed files and the use of pointers, linked lists, and inverted files. Prerequisite: IST 133 or equivalent. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Advanced Database Administration***IST 236 • 4 credits*

Provides in-depth knowledge and expertise in handling the critical tasks of planning and implementing database backup and recovery strategies and performance tuning using proven methodologies in a client/server environment. Introduces the fundamental DBA and management tasks necessary to

implement and maintain a data warehouse, how to manage the challenges of VLDB (Very Large DataBase) implementation, and how to manage and configure a database in a client/server environment. Prerequisite: IST 234. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Data Modeling and Design***IST 237 • 4 credits*

Applies life cycle application development methodologies to a top down, systematic approach to developing relational databases. Presents content to analyze data requirements as entities, attributes, and relationships and map an ER diagram to an initial database design. Introduces the available automated development tools and the rationale for when and how these tools are used within the development life cycle. Prerequisite: IST 133 or equivalent. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Java Programming II***IST 249 • 4 credits*

Teaches the solution of advanced programming problems using the Java language. Prerequisite: IST 149 or IST 172. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Information Center Management***IST 250 • 4 credits*

Focuses on management techniques required for analyzing and coordinating software and hardware solutions for end-user needs. Includes evaluation and communication techniques required to provide help desk support necessary to transfer knowledge and enable implementation of a solution. Prerequisite: IST 200. Lecture 4 hours per week.

**Computer Information System Development***IST 251 • 3 credits*

Presents a structured approach to defining needs, creating specifications, implementing new information systems. Teaches business-oriented, computer-based systems. Defines common processes and procedures. Includes data modeling, report generation, life cycle methodology, and traditional and structured tools for development. Prerequisites: IST 114 and one semester of high level computer language. Lecture 3 hours per week.

**Systems Development Project***IST 258 • 3 credits*

Applies life cycle system development methodologies in a case study. Incorporates feasibility

study, system analysis, system design, program specification, and implementation planning. Involves assigning a project to students as members of system development teams. Corequisite: IST 236/237 or equivalent. Lecture 3 hours per week.

**Computer Programming: COBOL II***IST 262 • 4 credits*

Teaches advanced structures programming techniques and procedures for more complex problems. Prerequisite: IST 162 or divisional approval. Lecture 4 hours per week.

**Advanced Programming: RPG***IST 268 • 4 credits*

Teaches advanced structured programming techniques and procedures for more complex problems. Prerequisite: IST 168 or divisional approval. Lecture 4 hours per week.

**Event-Driven C++***IST 274 • 4 credits*

Teaches writing C++ programs in an event-driven environment from stated problems or specifications, applying graphical user interface techniques to develop working software that meets specifications. Provides specific skills to create, modify, and de-bug applications. Prerequisite: IST 278. Lecture 4 hours per week.

**Event-Driven BASIC II***IST 276 • 4 credits*

Teaches advanced techniques for designing programming and implementing event-driven programs using BASIC. Prerequisite: IST 176 or divisional approval. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Computer Programming: C++ Object-Oriented Programming***IST 278 • 4 credits*

Teaches advanced techniques for designing, programming, and implementing object-oriented programs, using C++. Prerequisite: IST 172. Lecture 4 hours per week.

**Advanced Control Language Programming***IST 282 • 2 credits*

Teaches advanced techniques of Control language (CL). Topics include working with message queues and messages, using override commands, accessing system functions using APIs, displaying and changing command attributes, interpreting jobs, logs, and dumps, creating menus, and writing CL programs using advanced techniques. Includes

CL for specific computer systems. Prerequisite: IST 159. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

#### **Non-Procedural and Fourth Generation Languages**

*IST 283 • 4 credits*

Teaches writing non-procedural fourth generation language programs from stated problems or specifications. Includes specific skills for modifying and maintaining existing programs. Prerequisite: Divisional approval. Lecture 4 hours per week.

#### **Graphical User Interface Application Development**

*IST 284 • 4 credits*

Teaches the command language of selected personal computer applications. Such languages could include operating system batch file programming, application macro programming and Graphical User Interface (GUI) visual programming. Prerequisites: IST 114 and IST 117. Lecture 4 hours per week.

### **WINDOWS 2000 AND INTERNETWORKING FUNDAMENTALS**

#### **Windows 2000 - Professional**

*IST 193 • 4 credits*

Teaches the student how to install, configure, and administer Windows 2000 Professional as a desktop operating system. The student will learn how to implement, administer, secure, and troubleshoot Windows Professional as a desktop operating system in a networked data communications environment. Prerequisites: IST 106 and IST 216. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

#### **Windows 2000 - Server**

*IST 193 • 4 credits*

Teaches installation, configuration, management, customization, integration, monitoring, and troubleshooting the Windows 2000 Server as a member of a domain in an active directory environment. Prerequisite: IST 193 - Windows 2000 - Professional. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

#### **Windows 2000 - Network Infrastructure Administration**

*IST 193 • 4 credits*

Teaches how to install, configure, manage, monitor, and troubleshoot Directory Name Service

(DNS), Dynamic Host Configuration Protocol (DHCP), Remote Access, Network Protocols, IP Routing, and Windows Internet Network Services (WINS), in Windows 2000 network infrastructure. Provides instruction for managing, monitoring, and troubleshooting Network Address Translation and Certificate Services. Co-requisite: IST 193 - Windows 2000 - Server. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

#### **Windows 2000 - Directory Services Infrastructure Administration**

*IST 193 • 4 credits*

Focuses on the installation, configuration, and troubleshooting of the Windows 2000 Active Directory components and DNS for Active Directory. In addition, security problems/solutions will be examined. Group policy will be used to manage, monitor, and optimize the desktop environment. Prerequisite: IST - 193 Windows 2000 - Server. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

#### **Internetworking Fundamentals**

*IST 195 • 4 credits*

Introduces the functions of each layer of the ISO/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. Teaches features of the Cisco IOS software, including log in, context-sensitive help, command history and editing, loading software, configuring and verifying IP addresses, preparing the initial configuration of a router, and adding router protocols to the router configuration. Prerequisites: IST 106 and IST 216. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

#### **Switching & WAN Fundamentals**

*IST 195 • 4 credits*

Studies the advantages of LAN segmentation using bridges, routers, switches, and Fast Ethernet configuring access lists. Covers Spanning Tree Protocol and Virtual LANs. Focuses on the differences between the following WAN services: LAPB, Frame Relay, ISDN/LAP HDLC<PPP> and DDR. Prerequisite: IST 195 - Internetworking Fundamentals. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

#### **Windows 2000 - Network Infrastructure Design**

*IST 293 • 4 credits*

Teaches the student to analyze business requirements for a network infrastructure and design a network infrastructure that meets business re-

quirements including network topology, routing, IP addressing, WINS, DNS, VPN, remote access and telephony in an enterprise environment. Prerequisite: IST 193 - Windows 2000 - Server. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

#### **Windows 2000 - Network Security Design**

*IST 293 • 4 credits*

Provides students with the knowledge and skills necessary to design a security framework for small, medium, and enterprise networks using Microsoft Windows 2000 technologies. This course contains information that provides secure access to local network access, secure access to remote users and remote offices, secure access between private and public networks and secure access to partners. Prerequisite: IST 193 - Windows 2000 - Server. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

#### **Windows 2000 - Directory Services Infrastructure Design**

*IST 293 • 4 credits*

Provides students with the knowledge and skills necessary to analyze business requirements and design a directory service architecture that includes: unified directory services, such as Active Directory and Windows NT domains; connectivity between and within systems, system components, and applications; and data replication, such as directory replication and database replication. Prerequisite: IST 193 - Windows 2000 - Server. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

#### **Windows 2000 - SQL Server**

*IST 293 • 4 credits*

Teaches the student how to plan, install, configure, administer and maintain data. Additionally this course shows the student how to optimize and/or troubleshoot the SQL Server and audit the SQL server and database activity. Prerequisite: IST 193 - Windows 2000 - Server. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

#### **Windows 2000 - Exchange Server Administration**

*IST 293 • 4 credits*

Teaches the student how to plan, install, configure, administer, maintain, optimize, and troubleshoot Exchange Server. Prerequisite: IST 193 - Windows 2000 - Server. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

## COURSE DESCRIPTIONS

**Web Development Tools***IST 295 • 4 credits*

Offers advanced Web page instruction using a variety of Web development tools. Students enrolling in this course should have a strong foundation in designing Web pages using the HTML or XHTML language. An understanding of JavaScript is also required. Prerequisite: IST 223. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**INSTRUMENTATION****Principles of Instrumentation***INS 210 • 3 credits*

Covers various types of instruments and gauges used in the manufacturing processes; basic principles of pneumatic, hydraulic, electronic and mechanically operated devices. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**INTERIOR DESIGN****Theory and Techniques of Interior Design***IDS 100 • 3 credits*

Introduces drafting and presentation, color theory, and coordination, space planning and arrangement of furnishings. Prerequisite: STD 101. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Architectural Drafting for Interior Design***IDS 105 • 3 credits*

Introduces tools and equipment, lettering, methods of construction, designing and delineation of architecture. Prerequisite: STD 101. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Three-Dimensional Drawing and Rendering***IDS 106 • 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.

**Styles of Furniture and Interiors***IDS 109 • 3 credits*

Teaches history of furnishings and interiors from the ancient world to the present. Lecture 3 hours per week.

**Period Residential Design***IDS 116 • 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: IDS 105, IDS 109. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**Estimation for Interior Coverings***IDS 120 • 3 credits*

Provides instruction in estimation of yardage 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.

**Styles of Furniture and Interiors I***IDS 121 • 3 credits*

Introduces students to styles of furniture and interior design from the ancient world to the 18<sup>th</sup> Century and early 19<sup>th</sup> Century and suggests current applications to interior designs. Lecture 3 hours per week.

**Styles of Furniture and Interiors II***IDS 122 • 3 credits*

Introduces students to styles of furniture and interior design from the ancient world to the 19<sup>th</sup> Century and early 20<sup>th</sup> Century and suggests current applications to interior designs. Lecture 3 hours per week.

**Materials and Sources***IDS 205 • 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.

**Lighting and Furnishings***IDS 206 • 3 credits*

Provides instruction in lighting terminology and calculations and instruction in techniques of recognizing quality of construction in furnishings and related equipment. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Theory and Research in Commercial Design***IDS 215 • 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. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Advanced Rendering and Presentation***IDS 217 • 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. Prerequisites: IDS 105 and IDS 106. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

**Designing Commercial Interiors I***IDS 221 • 4 credits*

Presents problems in designing and developing presentations with emphasis on retail spaces. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**Designing Commercial Interiors II***IDS 222 • 4 credits*

Presents problems in designing and developing presentations with emphasis on office spaces. Lecture 2 hours. Laboratory 4 hours. Total 6 hours per week.

**Business Procedures***IDS 225 • 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.

**Antiques***IDS 235 • 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.

**Computer Aided Drafting for Interior Designers***IDS 245 • 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. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

**Cooperative Education in Interior Design***IDS 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms

coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**Window Treatments and Floor Coverings**  
*IDS \_\_\_ • 3 credits*

Introduces the student to all products available to the design profession for oriental goods. Window treatments provides instruction in the correct proportional design of soft window is explored. Lecture 3 hours per week.

## JAPANESE

**Beginning Japanese I-II**

*JPN 101-102 • 4 credits each*

Develops the understanding, speaking, reading, and writing of Japanese, and emphasizes the structure of the language. Lecture 4 hours per week. May include one additional hour of oral practice per week.

**Intermediate Japanese I-II**

*JPN 201-202 • 3 credits each*

Continues the development of skills to understand, speak, read, and write Japanese. Classes are conducted in Japanese. Prerequisite: JPN 102 or equivalent. Lecture 3 hours per week.

## LEGAL ADMINISTRATION

**Introduction to Law and the Legal Assistant**

*LGL 110 • 3 credits*

Introduces various areas of law in which a legal assistant will be working. Includes intense study of court systems (Virginia and federal) as well as a brief overview of criminal law, tort, domestic relations, evidence, ethics, the role of the legal assistant and other areas of interest. Lecture 3 hours per week.

**Real Estate Law for Legal Assistants**

*LGL 115 • 3 credits*

Studies law of property, and gives in-depth survey of more common types of real estate transactions and conveyances such as deeds, contracts, leases, and deeds of trust. Focuses on drafting problems involving these various instruments. Includes research projects, and studies the system of recording and search of public documents. Corequisite: LGL 110. Lecture 3 hours per week.

**Family Law**

*LGL 117 • 3 credits*

Covers divorce, Juvenile and Domestic Court matters, adoptions, annulments, suits to affirm marriage, and suits for separate maintenance. Corequisite: LGL 110. Lecture 3 hours per week.

**Legal Research**

*LGL 125 • 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, Shepards, ALR and other research tools. Corequisite: LGL 110. Lecture 3 hours per week.

**Legal Writing**

*LGL 126 • 3 credits*

Studies proper preparation of various legal documents, including case and appeal briefs, legal memoranda, letters and pleading. Involves practical applications. Requires competence in English grammar. Prerequisite: ENG 111 and LGL 125. Lecture 3 hours per week.

**Ethics for the Legal Assistant**

*LGL 200 • 1 credit*

Examines general principles of ethical conduct applicable to legal assistants. Includes the application of rules of ethics to the practicing legal assistant. Corequisite: LGL 110. Lecture 1 hour per week.

**Condominium Law**

*LGL 211 • 1 credit*

Studies the history and basis for condominiums and cooperatives. Covers creation, alteration, and termination of condos and co-ops. Examines legal aspects of management, sales, and ownership of horizontal property. Prerequisite: LGL 115. Lecture 1 hour per week.

**Deeds of Trust and Mortgages**

*LGL 212 • 3 credits*

Introduces the legal aspects of government and conventional real estate financing. Covers processing from initial application to final closing procedures. Includes commercial property, land acquisition, and construction loan deeds of trust or mortgages. Examines defaults and foreclosures. Prerequisite: LGL 115. Lecture 3 hours per week.

**Land Surveying for Real Estate Professionals**

*LGL 213 • 2 credits*

Introduces the real estate professional or legal assistant to the equipment, procedures, and computation of land surveying. Teaches the

reading of plats, site plans and surveys. Examines metes and bounds and other survey legal descriptions. Prerequisite: LGL 115. Lecture 2 hours per week.

**Trial Practice and the Law of Evidence**

*LGL 217 • 3 credits*

Introduces civil and criminal evidence; kinds, degrees and admissibility of evidence; and methods and techniques of its acquisition. Emphasizes Virginia and federal rules of evidence. Focuses on elements of a trial and various problems associated with the trial of a civil or criminal case. Corequisite: LGL 110. Lecture 3 hours per week.

**Criminal Law**

*LGL 218 • 3 credits*

Focuses on major crimes: their classification, elements of proof, intent, conspiracy, responsibility, parties, and defenses. Emphasizes Virginia law. Gives general principles of applicable constitutional law and criminal procedure. Prerequisite: LGL 110. Lecture 3 hours per week.

**Estate Planning and Probate**

*LGL 225 • 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. Corequisite: LGL 110. Lecture 3 hours per week.

**Real Estate Abstracting**

*LGL 226 • 3 credits*

Reviews aspects of abstracting title to real estate, recordation of land transactions, liens, grantor-grantee indices, warranties, covenants, restrictions, dower and courtesy rights and easements. Prerequisite: LGL 115. Lecture 3 hours per week.

**Real Estate Settlement Practicum**

*LGL 228 • 3 credits*

Focuses on methods and practices in administrative areas of real estate closings, back title information, preliminary report from attorney's title notes, lender's requirements, payoffs, HUD-1 settlement statement, real estate taxes, interest, escrow, disbursement and release of liens of record. Prerequisite: LGL 115. Lecture 3 hours per week.

## COURSE DESCRIPTIONS

**Legal Transactions***LGL 230 • 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. Corequisite: LGL 110. Lecture 3 hours per week.

**Advanced Legal Writing***LGL 231 • 3 credits*

Concentrates on preparing an appellate brief, including necessary research, critical writing, and statutory requirements of filing briefs in the Virginia and U.S. Appellate Court Systems. Prerequisite: LGL 126. Lecture 3 hours per week.

**Consumer Law and Collections***LGL 232 • 3 credits*

Examines civil collection practices and procedures. Includes pre- and post-judgment alternatives, judgment enforcement, and foreclosure actions. Also includes a survey of state and federal consumer protection laws and their application. Lecture 3 hours per week.

**Intellectual Property Law***LGL 234 • 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.

**Legal Aspects of Business Organizations***LGL 235 • 3 credits*

Studies fundamental principals 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. Lecture 3 hours per week.

**Legal Corporate Law***LGL 236 • 3 credits*

Studies fundamental principles of corporate law including capitalization, articles of incorporation, by-laws, tax returns, reports, financial statements and minutes, officers, employment contracts, and special problems. Lecture 3 hours per week.

**Law of Income Taxation***LGL 237 • 3 credits*

Studies the theory and practical application of the law of income taxation, including preparation of income tax returns and related materials. Lecture 3 hours per week.

**Bankruptcy***LGL 238 • 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. Corequisite: LGL 110. Lecture 3 hours per week.

**Cooperative Education in Legal Administration***LGL 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**MACHINE TECHNOLOGY****Machine Trade Theory and Computation I***MAC 111 • 3 credits*

Covers elementary shop mathematics specifically adapted to fractional and precision measuring tools. Includes shop theory and mathematics pertaining to layout, bandsaw, drill presses, the twist drill, lathe tool bit geometry and the engine lathe. Prerequisite: MTH 03 or equivalent. Corequisite: MAC 171. Lecture 3 hours per week.

**Machine Trade Theory and Computation II***MAC 112 • 3 credits*

Covers shop theory and mathematics pertaining to precision measuring tools. Includes thread cutting, taper turning, and other lathe operations. Covers shop theory and mathematics pertaining to the vertical and horizontal milling machines. Prerequisite: MAC 111. Corequisite: MAC 172. Lecture 3 hours per week.

**Machine Trade Theory and Computation III***MAC 113 • 3 credits*

Teaches advanced theory and computation of practical trigonometry in the use of the sine bar,

computation for the index head, rotary table and boring bar, and the use of the milling machine. Covers shop theory of grinding wheels, the surface grinder, and tool and cutter grinder. Prerequisite: MAC 112. Corequisite: MAC 173. Lecture 3 hours per week.

**Computer Numerical Control I-II***MAC 121-122 • 3 credits each*

Focuses on numerical control techniques in metal forming and machine processes. Includes theory and practice in lathe and milling machine computer numerical control program writing, setup and operation. Lecture 1-2 hours. Laboratory 2-3 hours. Total 3-5 hours per week.

**Machine Tool Operations I***MAC 171 • 3 credits*

Uses basic fractional and decimal measuring tools and hand tools. Covers linear, angular, and radial layout including bolt hole circles. Includes setup and operations of handsaws, drill presses, and the engine lathe as well as lathe tool bit grinding. Requires solutions of related problems and preparation of weekly laboratory reports. Corequisite: MAC 111. Laboratory 6 hours per week.

**Machine Tool Operations II***MAC 172 • 3 credits*

Covers precision measuring with inside and depth micrometers, vernier calipers, and vernier height gage. Demonstrates cutting external and internal threads, and performing these operations on the engine lathe. Teaches setup and operation of the vertical and horizontal milling machines. Requires solutions of related problems and preparation of weekly laboratory reports. Corequisite: MAC 112. Laboratory 6 hours per week.

**Machine Tool Operations III***MAC 173 • 3 credits*

Covers layout and measuring with the sine bar and gage block. Uses the index head and rotary table for precision division of units such as gear, groove, splines and holes. Selects grinding wheels for surface grinding and cutter grinding. Requires solutions of related problems and preparation of weekly laboratory reports. Prerequisite: MAC 172. Laboratory 6 hours per week.

**Machine Blueprint Reading I-II***MAC 181-182 • 3 credits each*

Introduces reading and interpreting blueprints and working drawings. Applies visualization of objects, sketching, and machine terminology. Lecture 3 hours per week.

**MARKETING****Principles of Marketing***MKT 100 • 3 credits*

Presents principles, methods and problems involved in the distribution and marketing of goods and services to industrial and ultimate consumers. Introduces various marketing middlemen, wholesaler, retailer, broker, agent, including cooperative and trade associations, shippers, stores and facilitators. Also discusses present-day problems and policies connected with distribution and sale of products, pricing, promotion, and buyer motivation. Examines variations of the marketing mix and market research, plus legal, social and ethical considerations in marketing. Lecture 3 hours per week.

**Principles of Selling***MKT 110 • 3 credits*

Presents fundamental aspects of personal selling, sales, ethics, and selling methods. Emphasizes professional sales techniques. Examines organization necessary for a well coordinated sales effort, including the training of sales personnel for maximum efficiency in selling, and organization of the sales division within the business enterprise. Introduces sales management in planning, organizing, directing and controlling the total sales effort. Lecture 3 hours per week.

**Retail Organization and Management***MKT 216 • 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.

**Principles of Advertising***MKT 220 • 3 credits*

Emphasizes the role of advertising in the marketing of goods and services. 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.

**Consumer Behavior***MKT 271 • 3 credits*

Examines the various influences affecting consumer buying behavior before, during, and after product purchase, including societal, cultural, environmental, group and economic determinants. Lecture 3 hours per week.

**International Marketing Management***MKT 276 • 3 credits*

Presents the process of marketing and management and applies it to the marketing of products within the global market place. 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.

**International Sales***MKT 277 • 3 credits*

Analyzes the personal sales function as it applies to international marketing. Studies effective communications, sales negotiations, presentations, various correspondence media and management of the sales process. Lecture 3 hours per week.

**Principles of E-Commerce***MKT 282 • 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.

**Cooperative Education in Marketing***MKT 297 • 1-5 credits*

Supervised on-the-job training for pay in approved business, industrial and service firms coordinated by the college's Cooperative Education Office. Is applicable to all occupational-technical curricula at the discretion of the college. Credit/work ratio not to exceed 1:5 hours. May be repeated for credit. Variable hours per week.

**Customer Service Management***MKT \_\_\_ • 3 credits*

Examines the role of customer service in achieving a firm's long-term goals, discusses the basic principles of effective customer service, and explores the tasks and responsibilities of a customer service manager. Includes such topics as the purpose of customer service; the establishment of a firm's customer service goals and

policies; the recruitment, selection, and training of customer service employees; empowering employees for better decision making; employee motivation techniques; and the evaluation of customer service employees and the customer service program. Lecture 3 hours per week.

**Marketing for Small Business***MKT \_\_\_ • 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.

**MATHEMATICS****Arithmetic***MTH 02 • 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.

**Algebra I***MTH 03 • 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.

**Algebra II***MTH 04 • 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.

## COURSE DESCRIPTIONS

**Applied Technical Mathematics I-II***MTH 103-104 • 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.

**Survey of Technical Mathematics I-II-III-IV***MTH 105-106-107-108 •**2 credits each*

Reviews arithmetic and introduces measurement, basic algebra, plane and solid geometry, and trigonometry. Prerequisites: A placement recommendation for MTH 105 and one unit of high school mathematics or equivalent. Lecture 2 hours per week.

**Technical Mathematics I-II***MTH 115-116 • 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.

**Fundamentals of Mathematics I-II***MTH 121-122 • 3 credits each*

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.

**Mathematics for Allied Health***MTH 126 • 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.

**Elementary Technical Mathematics for Electrical and Mechanical Trades***MTH 147 • 4 credits*

Focuses on algebra and trigonometry, including first- and second-degree equations, system of equations, determinants, factoring, functions, graphs, triangles, vectors, and the metric system. Emphasizes trade applications. Prerequisites: A placement recommendation for MTH 147 and Algebra I and Geometry, or Algebra I and Algebra II, or equivalent. Lecture 4 hours per week.

**Elementary Technical Mathematics for Electrical Trades***MTH 148 • 4 credits*

Introduces analytic geometry, Boolean algebra, and number systems. Covers ratio, proportion, variation, exponents, radicals, trigonometric graphs, complex numbers, logarithms, and exponential functions. Emphasizes trade applications. Prerequisite: MTH 147 or equivalent. Lecture 4 hours per week.

**Elementary Technical Mathematics for Mechanical Trades***MTH 149 • 4 credits*

Focuses on algebra, geometry, ratio, proportion, variation, three-dimensional and trigonometric graphing, analytic geometry, exponents, radicals, and metric system. Emphasizes trade applications. Prerequisite: MTH 147 or equivalent. Lecture 4 hours per week.

**Topics in Geometry***MTH 150 • 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.

**Mathematics for the Liberal Arts I***MTH 151 • 3 credits*

Presents topics in sets, logic, numeration systems, geometric systems, and elementary computer concepts. Prerequisites: A placement recommendation for MTH 151 and Algebra I, Algebra II, and Geometry or equivalent. Lecture 3 hours per week.

**Mathematics for the Liberal Arts II***MTH 152 • 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.

**Elementary Statistics***MTH 157 • 3 credits*

Presents elementary statistical methods and concepts including descriptive statistics, estimation hypothesis testing, linear regression, and categorical data analysis. Prerequisites: A placement recommendation for MTH 157 and Algebra I, Algebra II and Geometry or equivalent. (Credit will not be awarded for both MTH 157 and MTH 240.) Lecture 3 hours per week.

**College Algebra***MTH 158 • 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.

**Precalculus I***MTH 163 • 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.

**Precalculus II***MTH 164 • 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.

**Precalculus with Trigonometry***MTH 166 • 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.

**Calculus with Analytic Geometry I***MTH 173 • 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.

**Calculus with Analytic Geometry II**  
*MTH 174 • 5 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 5 hours per week.

**Statistics**  
*MTH 240 • 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.

**Applied Calculus**  
*MTH 270 • 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.

**Multivariable Calculus and Linear Algebra**  
*MTH 275 • 4 credits*

Presents vector valued functions, partial derivatives, multiple integrals, matrices, vector spaces, determinants, solutions of systems of linear equations, basis and dimension, eigenvalues, and eigenvectors. Designed for mathematical, physical, and engineering science programs. Prerequisite: MTH 174 or equivalent. Lecture 4 hours per week.

**Ordinary Differential Equations**  
*MTH 279 • 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 275 or equivalent. Lecture 4 hours per week.

**Discrete Mathematics**  
*MTH 286 • 4 credits*

Presents topics in discrete mathematical structures which are basic tools used in computer science. Covers sets, Boolean algebra, counting methods, generating functions, and recurrence relations, graph theory, trees, an introduction to finite state automata. Designed for mathematical, physical, and engineering science programs. Prerequisite: MTH 174 or equivalent. Lecture 4 hours per week.

**MECHANICAL  
ENGINEERING  
TECHNOLOGY**

**Materials for Industry**  
*MEC 111 • 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, materials systems, thermal processing, and electronic-related materials. Lecture 3 hours per week.

**Processes of Industry**  
*MEC 112 • 3 credits*

Analyzes the processes of manufacturing products from materials for industry/engineering. Includes machining, casting, forming, molding, hot/cold working, chipless machining, and welding. Addresses quality assurance and inspection procedures. Lecture 3 hours per week.

**Principles of Machine Technology**  
*MEC 120 • 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.

**Computer Programming for Technologists**  
*MEC 126 • 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. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Mechanics I - Statics for Engineering Technology**  
*MEC 131 • 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 system in space. Prerequisite: MTH 116. Lecture 3 hours per week.

**Mechanics II - Strength of Materials for Engineering Technology**  
*MEC 132 • 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. Lecture 3 hours per week.

**Mechanisms**  
*MEC 155 • 2 credits*

Studies the purpose and actions of cams, gear trains, levers, and other mechanical devices used to transmit control. Focuses on motions, linkages, velocities, and acceleration of points within a link mechanism; layout method for designing cams and gear train. Requires preparation of weekly laboratory reports. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Fluid Power - Hydraulics Systems**  
*MEC 268 • 3 credits*

Studies hydraulic components and their integration into complex systems including system analysis and troubleshooting. 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.

**Fluid Power - Pneumatic Systems**  
*MEC 269 • 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.

## COURSE DESCRIPTIONS

**MEDICAL ASSISTING****Introduction to Medical Assisting**  
*MDA 100 • 1 credit*

Introduces students to the medical practice environment. Stresses the responsibilities of the humanistic approach in the rendering of health care. Lecture 1 hour per week.

**Medical Assistant Science I***MDA 101 • 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. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week.

**Medical Assistant Science II***MDA 102 • 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. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Medical Assistant Science III***MDA 103 • 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. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Medical Assistant Science IV***MDA 104 • 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. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Pharmacology for Medical Assistants***MDA 107 • 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. Lecture 2 hours per week.

**Coordinated Internship***MDA 190 • 1-5 credits*

Includes supervised practices in selected health facilities coordinated by the college. Variable hours per week.

**Medical Office Procedures***MDA 203 • 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. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Medical Law and Ethics***MDA 207 • 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. Lecture 2 hours per week.

**Medical Office Coding***MDA 208 • 2 credits*

Introduces students to ICD-9 and CPT-4 classification coding systems used in physician offices, hospitals, and ambulatory care settings. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Medical Office Insurance***MDA 209 • 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. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Medical Office Software Applications***MDA 210 • 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.

**Diagnostic Laboratory Procedures***MDA 221 • 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. Also includes urinalysis and hematology testing. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**MENTAL HEALTH****Group Process I-II***MEN 221-222 • 3 credits each*

Studies the stages of group development, role of the group leader, and contemporary models of group counseling utilized in mental health counseling. Includes experiential training in group leadership. Prerequisite: Consent of instructor. Lecture 3 hours per week.

**MILITARY SCIENCE****Military Science I-II***MSC 111-112 • 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.

**Military Science III-IV***MSC 211-212 • 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.

**MUSIC****Basic Musicianship I-II***MUS 101-102 • 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.

**Music Theory I-II***MUS 111-112 • 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.

**Music Appreciation I-II***MUS 121-122 • 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.

**Organizing and Directing Choral Activities I-II***MUS 123-124 • 3 credits each*

Develops organizational skills necessary for directing a variety of choral groups, planning a rehearsal, and building a choral program. Enables students to master the conducting skills that deal with beat patterns, score reading, and musical terminology. Permits performance in laboratory groups as singers and conductors to gain experience in selecting and rehearsing music. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Organizing and Directing the Church Choir***MUS 128 • 3 credits*

Examines specific problems for church choirs, recruiting new members, training unskilled singers, establishing a philosophy of church music selection and service participation, and motivating the singers. Surveys choir materials that improve diction, sight reading, and vocal performance. Includes application of rehearsal procedures and conducting techniques. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Class Voice I-II***MUS 131-132 • 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.

**Applied Music - Voice***MUS 136 • 1-2 credits*

Teaches singing, proper breath control, diction, and development of tone. Studies the standard vocal repertoire. Prerequisite: Di-

visional approval. 1-2 half-hour lessons per week. 4-8 hours practice required.

**Chorus Ensemble***MUS 137 • 1 credit*

Course 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.

**Class Piano I-II***MUS 141-142 • 2 credits each*

Offers the beginning piano student activities, 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 majors. Lecture 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Applied Music - Keyboard***MUS 145 • 1-2 credits*

Teaches piano, organ, harpsichord, or synthesizer. Studies the standard repertoire. Private lessons are available for either 1 or 2 hours of credit per semester. The length of the lessons will be 1/2 hour for 1 hour credit and 1 hour for 2 hours credit per semester. All courses in applied music may be repeated for a total of 8 hours for the major and 4 hours for the minor. 1-2 half hour lessons per week, 4-8 hours practice (laboratory) required. Laboratory 4-8 hours per week.

**Applied Music - Woodwinds***MUS 155 • 1-2 credits*

Teaches fundamentals of the woodwind instruments. Studies the standard repertoire. Prerequisite divisional permission. Private lessons are available for either 1 or 2 hours of credit per semester. The length of the lessons will be 1/2 hour for 1 hour credit and 1 hour for 2 hours credit per semester. All courses in applied music may be repeated for a total of 8 hours for the major and 4 hours for the minor. 1-2 half-hour lessons per week, 4-8 hours practice (laboratory) required. Laboratory 4-8 hours per week.

**Improvisational Techniques***MUS 159 • 3 credits*

Introduces the principals 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.

**Applied Music - Strings***MUS 165 • 1-2 credits*

Teaches fundamentals of string instruments, harp or guitar. Studies the standard repertoire. Prerequisite: Divisional approval. 1-2 half-hour lessons per week. 4-8 hours practice required.

**Applied Music - Brass***MUS 175 • 1-2 credits*

Teaches fundamentals of brass instruments. Studies the standard repertoire. Prerequisite divisional approval. Private lessons are available for either 1 or 2 hours of credit per semester. The length of the lessons will be 1/2 hour for 1 hour credit and 1 hour for 2 hours credit per semester. All courses in applied music may be repeated for a total of 8 hours for the major and 4 hours for the minor. 1-2 half-hour lessons per week, 4-8 hours practice (laboratory) required. Laboratory 4-8 hours per week.

**Applied Music - Percussion***MUS 185 • 1-2 credits*

Teaches fundamentals of percussion instruments. Studies the standard repertoire. Prerequisite divisional permission. Private lessons are available for either 1 or 2 hours of credit per semester. The length of the lessons will be 1/2 hour for 1 hour credit and 1 hour for 2 hours credit per semester. All courses in applied music may be repeated for a total of 8 hours for the major and 4 hours for the minor. 1-2 half-hour lessons per week, 4-8 hours practice (laboratory) required. Laboratory 4-8 hours per week.

**History of Music I-II***MUS 221-222 • 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.

**Advanced Applied Music - Voice***MUS 236 • 1-2 credits*

Continues MUS 136.

**Advanced Applied Music - Keyboard***MUS 245 • 1-2 credits*

Continues MUS 145.

## COURSE DESCRIPTIONS

**Advanced Applied Music - Strings**  
*MUS 265 • 1-2 credits*  
 Continues MUS 165.

**Cooperative Education in Music**  
*MUS 297 • 1-5 credits*

Supervised on-the-job training for pay in selected business, industrial or service firms coordinated by the college's Cooperative Education Office. Credit/work ratio 1:5 hours. May be repeated for credit. Variable hours per week.

Note: Private Applied Music courses open to music majors only.

**NATURAL SCIENCE****Physical Science I-II**

*NAS 111-112 • 4 credits each*

Treats selected topics from the cosmic to the sub-atomic levels. Emphasizes the inherent uncertainty of knowledge and the peritonal philosophy of the physical sciences. Lecture 3 hours per week. Recitation and laboratory 3 hours. Total 6 hours per week.

**Introductory Meteorology**

*NAS 120 • 3 credits*

Studies cloud formation, weather maps, forecasting, and wind systems with emphasis on local weather patterns. Lecture 3 hours per week.

**Meteorology**

*NAS 125 • 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.

**Elements of Astronomy**

*NAS 130 • 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.

**Astronomy I-II**

*NAS 131-132 • 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.

**Upper Extremity Anatomy and Kinesiology**  
*NAS 177 • 1 credit*

Presents specific details of the skeletal, articular, muscular and neurologic anatomy of the human arm. Lecture 1 hour per week.

**Underwater Research in Geology and Oceanography**

*NAS 230 • 4 credits*

Teaches various sampling techniques and methodologies of underwater research, including sampling strategies for benthic and pelagic flora and fauna as well as geological, archeological, and chemical sampling underwater. Provides opportunity for instruction/certification in basic and advanced Scuba. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**Cooperative Education in Natural Science**

*NAS 297 • 1-5 credits*

Supervised on-the-job training for pay in selected businesses, industrial, or service firms coordinated by the college's Cooperative Education Office. Credit/work ratio 1:5 hours. May be repeated for credit. Variable hours per week.

**NURSING****Nurses Aide I**

*NUR 27 • 4 credits*

Teaches care of older patients with emphasis on the social, emotional and spiritual needs of geriatric patients; procedures, communication and interpersonal relations; observations, 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.

**Nursing I**

*NUR 111 • 8 credits*

Introduces nursing principles, concepts and the nursing process. Develops nursing skills to meet the biopsychosocial needs of individuals. May include math computational skills and basic computer instruction related to the delivery of nursing care. Provides supervised learning experiences in a college nursing laboratory and/or cooperating agencies. Lecture 4 hours. Laboratory 12 hours. Total 16 hours per week.

**Nursing II**

*NUR 112 • 8 credits*

Focuses on the nursing care of individuals and/or families experiencing changes along the health/illness continuum that are common, well-defined, and have predictable outcomes. Provides supervised learning experiences in a college nursing laboratory and/or cooperating agencies. Lecture 4 hours. Laboratory 12 hours. Total 16 hours per week.

**LPN Transition**

*NUR 115 • 6 credits*

Synthesizes essential theoretical concepts related to the use of the nursing process in meeting basic needs of individuals and families, promoting optimal wellness, applying communication theory and understanding the role/function of the associate degree nurse graduate. Lecture 4 hours. Laboratory 6 hours. Total 10 hours per week.

**Nursing Terminology and Charting**

*NUR 120 • 2 credits*

Focuses on basic terminology used in nursing. Emphasizes combining word forms and application to nursing situations and the patient's record. Lecture 2 hours per week.

**Drug Dosage Calculations**

*NUR 135 • 2 credits*

Teaches apothecary, metric, household conversion; reading drug orders and labels. Provides a practical approach to learning to calculate and prepare medications and solutions. Includes calculating intravenous flow rates and pediatric dosages. Lecture 2 hours per week.

**Principles of Pharmacology I-II**

*NUR 136-137 • 1 credit each*

Teaches principles of medication administration which include dosage calculations, major drug coalifications, drug legislation, legal aspects of medication administration, drug action on specific body systems, and basic computer applications. Lecture 1 hour per week.

**Introduction to Surgical Care**

*NUR 140 • 2 credits*

Introduces the study of the surgical process, including aspects of the operating room environment. Highlights preparing the patient for surgery, including transporting, positioning, and special preparation procedures. Presents physical, psychological, and spiritual needs of the patient, including ethical and legal rights of the patient. Lecture 2

hours. Laboratory 6 hours. Total 8 hours per week. (This course is taught in an eight week session.)

### **Fundamentals of Surgical Care I**

*NUR 141 • 3 credits*

Introduces principles of aseptic technique, sterilization, disinfection and antisepsis including environmental safety and control, CDC and OSHA requirements. Presents packaging, storing and dispensing surgical supplies. Prerequisite: NUR 140. Lecture 4 hours. Laboratory 6 hours. Total 10 hours per week. (This course is taught in an eight week session.)

### **Fundamentals of Surgical Care II**

*NUR 142 • 3 credits*

Introduces principles of wound healing including types, stages, and complications; types, preparation and care of surgical supplies, packing, dressings, catheters, drains, tubes, supplies and equipment; classifications of instruments, sutures and needles. Describes responsibilities related to the scrub and circulating roles. Provides students practical experience in the operating room. Prerequisite: NUR 141 Lecture 4 hours. Laboratory 6 hours. Total 10 hours per week. (This course is taught in an eight week session.)

### **Essentials of Medical/Surgical Nursing**

*NUR 170 • 4 credits*

Teaches care of individuals/families requiring medical or surgical treatment. Uses all components of the nursing process with increasing 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. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

### **Essentials of Maternal/Newborn Nursing**

*NUR 180 • 4 credits*

Teach nursing care of individuals and families during the ante partum, intra partum, and post partum periods. Includes pediatric dosage computational skills and the utilization of the nursing process in caring for individuals and families. Provides supervised learning experiences in the college laboratory and/or cooperating agencies. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

### **Psychiatric Nursing**

*NUR 201 • 4 credits*

Teaches care of individuals requiring psychiatric treatment. Uses all components of the nursing process with increasing degrees of skill. Provides supervised learning experiences in a college nursing laboratory and/or cooperating agencies. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

### **Medical/Surgical Nursing I-II**

*NUR 202-203 • 4 credits each*

Teaches care of adult individuals requiring medical or surgical treatment. Uses all components of the nursing process with increasing degrees of skill. Provides supervised learning experiences in a college nursing laboratory and/or cooperating agencies. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

### **Surgical Procedures I-II**

*NUR 209-210 • 4 credits each*

Introduces the surgical specialties of general, gastroenterology, gynecology, ophthalmology, plastic and throat, dental, oral and maxillofacial, plastic and reconstructive, pediatrics, oncology, neurology, orthopedics, cardiac, thoracic, vascular, transplant, and trauma in a laboratory and clinical experience. Prerequisite: NUR 142 and BIO 100. Lecture 4 hours. Laboratory 12 hours. Total 16 hours per week. (This course is taught in an eight week session.)

### **Second Level Nursing I**

*NUR 211 • 8 credits*

Emphasizes the nursing area of individuals/families in various stages of development experiencing problems related to their biopsychosocial needs. Uses all components of the nursing process with increasing degrees of skill. Provides supervised learning experiences in a college nursing laboratory and/or cooperating agencies. Lecture 4 hours. Laboratory 12 hours. Total 16 hours per week.

### **Second Level Nursing II**

*NUR 212 • 8 credits*

Emphasizes the nursing area of individuals/families in various stages of development experiencing problems related to their biopsychosocial needs. Uses all components of the nursing process with increasing degrees of skill. Provides supervised learning experiences in a college nursing laboratory and/or cooperating agencies. Lecture 4 hours. Laboratory 12 hours. Total 16 hours per week.

### **Health Assessment**

*NUR 226 • 2 credits*

Teaches the systematic approach to obtaining a health history and performing a physical assessment. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

### **Principles of Pharmacology III**

*NUR 236 • 1 credit*

Teaches principles of medication and administration which include dosage calculations, major drug classifications, drug legislation, legal aspects of medication administration and drug action on specific body systems. Lecture 1 hour per week.

### **Dimensions of Professional Nursing**

*NUR 254 • 2 credits*

Explores the role of the professional nurse. Emphasizes nursing organizations, legal and ethical implications, and addresses trends in management and organizational skills. Explores group dynamics, relationships, conflicts, and leadership styles. Lecture 1 hour per week.

## **OCCUPATIONAL THERAPY**

### **Introduction to Occupational Therapy**

*OCT 100 • 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. Lecture 3 hours per week.

### **Coordinated Internship (Clinical) in Occupational Therapy**

*OCT 190 • 1 credit*

Includes supervised practice in selected health agencies coordinated by the college. Variable hours per week. (May be repeated for credit.)

### **Occupational Therapy with Psychosocial Dysfunction**

*OCT 201 • 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

## COURSE DESCRIPTIONS

implementation of treatment programs. Corequisite: OCT 190. Lecture 3 hours per week.

### Occupational Therapy with Physical Disabilities

*OCT 202 • 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. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

### Occupational Therapy with Developmental Disabilities

*OCT 203 • 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. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

### Therapeutic Media

*OCT 205 • 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. Lecture 1 hours. Laboratory 3 hours. Total 4 hours per week.

### Dyadic and Group Dynamics

*OCT 206 • 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. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

### Occupational Therapy Service Management

*OCT 208 • 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 with an emphasis on organizing and managing activity departments in long-term facilities. Lecture 3 hours per week.

### Assistive Technology in Occupational Therapy

*OCT 210 • 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 disabilities. Presents information on funding and maintenance of devices. Exposes students to technology in clinical practice and equipment companies. Prerequisites: OCT 202-203. Lecture 2 hours per week.

### Coordinated Internship (Clinical)

*OCT 290 • 4 credits*

Includes supervised practice in selected health agencies coordinated by the college. Variable hours per week. (May be repeated for credit.)

## PHILOSOPHY

### Introduction to Philosophy I-II

*PHI 101-102 • 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.

### Logic I

*PHI 111 • 3 credits*

Introduces inductive and deductive reasoning, with an emphasis on common errors and fallacies. Lecture 3 hours per week.

### Practical Reasoning

*PHI 115 • 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.

### Ethics

*PHI 220 • 3 credits*

Provides a systematic study of representative ethical systems. Lecture 3 hours per week.

### Social Ethics

*PHI 226 • 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.

## PHOTOGRAPHY

### Photography I-II

*PHT 101-102 • 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.

### History of Photography

*PHT 110 • 3 credits*

Surveys important photographers, processes, and historical influences of the nineteenth and twentieth centuries. Lecture 3 hours per week.

### Advanced Photography I-II

*PHT 201-202 • 3 credits each*

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.

### Zone System in Photography

*PHT 205 • 3 credits*

This is 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 "previsualization" techniques. Prerequisite: PHT 102 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

### Color Photography I-II

*PHT 211-212 • 3 credits each*

Introduces theory, materials, and processes of modern color images. Includes additive and subtractive theory, color filtration, and negative and positive printing techniques. Prerequisite: PHT 101 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Studio Lighting I-II***PHT 221-222 • 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.

**Commercial Photography***PHT 226 • 3 credits*

Examines advanced topics relating to commercial photography. Emphasizes advertising, portraiture, and commercial and public relations. Prerequisite: PHT 222. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Film Making***PHT 236 • 3 credits*

Covers techniques of shooting and editing film, preparing documentaries, producing animated movies. Provides the opportunity for students to create their own films. Lecture 1 hour. Laboratory 4 hours. Total 5 hours per week.

**Advanced Photographic Printing***PHT 246 • 3 credits*

Examines advanced printing techniques and principles of archival processing and presentation. Emphasizes development of individual printing style. Requires a portfolio of high quality prints on the subject of choice. Prerequisite: PHT 102 or equivalent. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Alternative Photographic Processes***PHT 247 • 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.

**Digital Photography***PHT 264 • 3 credits*

Provides an introduction to digital still photography with emphasis on the use of digital cameras, image manipulation and the digital transfer of images via the Internet. Prerequisites: PHT 101 and ART 283. Lecture 1 hour. Studio instruction 4 hours. Total 5 hours per week.

**Cooperative Education in Photography***PHT 297 • 1-5 credits*

Supervised on-the-job training for pay in selected business, industrial, or service firms coordinated by the college. Credit/work ratio 1:5 hours. May be repeated for credit. Variable hours per week.

**PHYSICAL EDUCATION AND RECREATION****Fundamentals of Physical Activity***PED 101-102 • 2 credits each*

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. Total 2 hours per week.

**Weight Training I-II***PED 111-112 • 1 credit each*

Focuses on muscular strength and endurance training through individualized workout programs. Teaches appropriate use of weight training equipment. Total 2 hours per week.

**Racketball I-II***PED 121-122 • 1 credit each*

Teaches racketball skills and strategies for team and individual play. Includes terminology, scoring, etiquette, equipment selection, and safety. Total 2 hours per week.

**Tennis I-II***PED 123-124 • 1 credit each*

Teaches tennis skills with emphasis on stroke development and strategies for individual and team play. Includes rules, scoring, terminology, and etiquette. Total 2 hours per week.

**Archery***PED 126 • 1-2 credits*

Teaches skills and techniques of target archery. Focuses on use and maintenance of equipment, terminology, and safety. Variable hours per week.

**Golf I-II***PED 133-134 • 1 credit each*

Teaches basic skills of golf, rules, etiquette, scoring, terminology, equipment selection and use, and strategy. Total 2 hours per week.

**Bowling I-II***PED 135-136 • 1 credit each*

Teaches basic bowling skills and techniques, scoring, rules, etiquette, and terminology. Total 2 hours per week.

**Martial Arts I-II***PED 137-138 • 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 1 hour. Laboratory 2 hours. Total 3 hours per week.

**Basketball***PED 152 • 1 credit*

Introduces basketball skills, techniques, rules, and strategies. Total 2 hours per week.

**Volleyball***PED 154 • 1 credit*

Introduces volleyball skills, techniques, strategies, rules, and scoring. Total 2 hours per week.

**Softball***PED 156 • 1 credit*

Emphasizes softball skills, techniques, strategies, and rules. Total 2 hours per week.

**Camping***PED 176 • 2 credits*

Introduces camping techniques, equipment, site selection and use, safety procedures, and camping ecology. Total 2 hours per week.

**PHYSICAL THERAPY ASSISTANT****Introduction to Physical Therapist****Assisting***PTH 105 • 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.

**Therapeutic Procedures I-II***PTH 121-122 • 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 car-

## COURSE DESCRIPTIONS

diopulmonary rehabilitation. Lecture 3 hours. Laboratory 6 hours. Total 9 hours per week.

#### Clinical Education

*PTH 131 • 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.

#### Musculoskeletal Structure and Function

*PTH 151 • 5 credits*

Studies the human musculoskeletal system. Terms of position and movement, location, and identification of specific bony landmarks, joint structure and design, ligaments, muscle origin, action and innervation, and types of contraction are emphasized. Lecture 3 hours. Laboratory 4 hours. Total 7 hours per week.

#### Psychological Aspects of Therapy

*PTH 210 • 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.

#### Clinical Practice II

*PTH 212 • 7 credits*

Provides instruction in local health care facilities in the actual administration of physical therapy treatments under the supervision of licensed physical therapists, or physical therapist assistants. Provides experience in a variety of clinical settings. Laboratory 28 hours per week.

#### Rehabilitation Procedures

*PTH 225 • 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.

#### Therapeutic Exercise

*PTH 226 • 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.

#### Seminar in Physical Therapy

*PTH 255 • 2 credits*

Includes preparation for licensing examinations, specialized lectures, and preparation of a student project. Lecture 2 hours per week.

## PHYSICS

#### Electricity

*PHY 35 • 2 credits*

Examines electricity as it relates to ship repair trades. Covers current magnetism, electrostatics, electric circuits, electromagnetic induction, production and distribution of electric energy, generators and motors. Lecture 2 hours per week.

#### Heat and Thermodynamics

*PHY 36 • 2 credits*

Explores thermodynamics as it relates to ship repair. Covers temperature and its effect, heat transfer, heat engines, and energy resources. Lecture 2 hours per week.

#### Mechanical Properties of Matter

*PHY 37 • 2 credits*

Examines properties of matter as they relate to ship repair. Covers atoms, molecules, and properties of solids, liquids and gases. Lecture 2 hours per week.

#### Elements of Physics

*PHY 100 • 4 credits*

Covers basic concepts of physics, including Newtonian mechanics, properties of matter, heat and sound, and fundamentals of electricity. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

#### Survey of Applied Physics

*PHY 130 • 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.

#### General College Physics I-II

*PHY 201-202 • 4 credits each*

Teaches fundamental principles of physics. Covers mechanics, thermodynamics, wave phenomena, electricity and magnetism, and selected topics in modern physics. Prerequisite: MTH 115 or equivalent. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

#### University Physics I-II

*PHY 241-242 • 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

#### Basics of American Politics

*PLS 130 • 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.

#### U.S. Government I-II

*PLS 211-212 • 3 credits each*

Teaches structure, operation, and processes 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.

#### International Relations I

*PLS 241 • 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.

#### International Relations II

*PLS 242 • 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.

#### Cooperative Education in Political Science

*PLS 297 • 1-5 credits*

Supervised on-the-job training for pay in selected business, industrial or service firms coordinated by the college. Credit/work ratio 1:5 hours. May be repeated for credit. Variable hours per week.

**PSYCHOLOGY****Principles of Applied Psychology**  
*PSY 100 • 3 credits*

Introduces the general principles of psychology as they are applied to work, relationships, and self. Includes perception, learning, development, motivation, emotion, therapy, communication, attitudes. Lecture 3 hours per week. (Credit for both PSY 100 and PSY 201 will not be awarded)

**Psychology for Business and Industry**  
*PSY 126 • 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.

**Psychology of Human Sexuality**  
*PSY 165 • 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.

**Principles of Psychology**  
*PSY 200 • 3 credits*

Surveys the basic concepts of psychology. Covers the scientific study of behavior, behavioral research methods and analysis, and theoretical interpretations. Includes topics such as: physiological mechanisms, sensation/perception, motivation, learning, personality, psychopathology, therapy, and social psychology. Lecture 3 hours per week.

**Introduction to Psychology I-II**  
*PSY 201-202 • 3 credits each*

Examines human and animal behavior, relating experimental studies to practical problems. Includes topics such as sensations/perception, learning, memory, motivation, emotion, stress, development, intelligence, personality, psychopathology therapy, and social psychology. Lecture 3 hours per week.

**Abnormal Psychology**  
*PSY 215 • 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. Prerequisite: PSY 201. Lecture 3 hours per week.

**Introduction to Behavior Modification**  
*PSY 220 • 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.

**Developmental Psychology**  
*PSY 230 • 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.

**Life Span Human Development I-II**  
*PSY 231-232 • 3 credits each*

Investigates human behavior through the life cycle. Describes physical, cognitive, and psychosocial aspects of human development from conception to death. Lecture 3 hours per week.

**Child Psychology**  
*PSY 235 • 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.

**Adolescent Psychology**  
*PSY 236 • 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.

**Psychological Aspects of Criminal Behavior**  
*PSY 255 • 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. Lecture 3 hours per week.

**Cooperative Education in Psychology**  
*PSY 297 • 1-5 credits*

Supervised on-the-job training for pay in selected business, industrial or service firms coordinated by the college's Cooperative Education Office. Credit/work ratio 1:5 hours. May be repeated for credit. Variable hours per week.

**RADIOGRAPHY****Introduction to Radiology, Protection and Patient Care**  
*RAD 105 • 3 credits*

Presents a brief history of the radiologic profession, code of ethics, conduct for radiologic students, and basic fundamentals of radiation protection. Teaches the care and handling of the sick and injured patient in the Radiology Department. Introduces the use of contrast media necessary in the investigation of the internal organs. Lecture 3 hours per week.

**Radiographic Procedures I**  
*RAD 121 • 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.

**Chest, Abdominal and Skeletal Imaging**  
*RAD 129 • 4 credits*

Discusses the anatomy, physiology, and routing projections for the upper and lower extremities, vertebral column, chest, and cranium. Provides the opportunity for students to learn positioning for chest, abdominal, and skeletal films. Prerequisite: RAD 110. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**Elementary Clinical Procedures I-II**  
*RAD 131-132 • 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 cooperative health agencies. Clinical 15 hours per week.

**Principles of Radiographic Quality I-II**  
*RAD 141-142 • 4 credits each*

Presents all factors that control and influence radiographic quality as well as various technical conversion factors useful in radiography. Automatic film processing, sensitometry, and quality assurance testing are also discussed. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**Coordinated Internship**  
*RAD 190 • 3 credits*

Includes supervised practice in selected health agencies coordinated by the college. Clinical 24 hours per week.

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**Radiation Protection and Radiobiology**  
*RAD 205 • 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.

**Human Disease and Radiography***RAD 206 • 1 credit*

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 1 hour per week.

**Correlated Radiographic Theory***RAD 215 • 2 credits*

Presents intensive correlation of all major radiologic technology subject areas. Studies interrelationships of biology, physics, principles of exposure, radiologic procedures, patient care, and radiation protection. Lecture 2 hours per week.

**Radiographic Procedures II***RAD 221 • 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.

**Advanced Clinical Procedures I-II***RAD 231-232 • 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 24 hours per week.

**Mammography Techniques and Pathology***RAD 239 • 5 credits*

Provides ARRT registered radiologic technologists with the training required to perform mammographic examinations in a FDA accredited mammography facility. Topics include breast anatomy, physiology and pathology, breast imaging and instrumentation, mammographic positioning and compression, imaging of the augmented breast, quality assurance/quality control techniques, facility inspection, pathology correlation, patient risk factors, and breast self exam (BSE) certification. Upon successful completion of the course, technologists who have been ARRT registered for a minimum of 1 year will be prepared to take the advanced ARRT registry in Mammography. Lecture 3 hours. Laboratory 6 hours. Total 9 hours per week.

**Radiologic Specialties***RAD 245 • 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, principal of operation, and clinical application of these topics. Lecture 1 hour per week.

**Radiographic Equipment***RAD 255 • 3 credits*

Studies principles and operation of general and specialized X-ray equipment. Lecture 3 hours per week.

**REAL ESTATE****Principles of Real Estate***REA 100 • 4 credits*

Examines practical applications of real estate principles. Includes a study of titles, estates, land description, contracts, legal instruments, financing and management of real estate. Lecture 4 hours per week.

**RECREATION AND PARKS****Introduction to the Field of Recreation and Parks***RPK 100 • 3 credits*

Includes history and philosophy of the recreation and parks movement. Discusses the theory of leisure and play. Analyzes leisure service delivery systems and career opportunities. Emphasizes the private, commercial, and industrial sectors, Armed Forces, and volunteers, as well as the public area. Lecture 3 hours per week.

**Recreational Arts and Crafts***RPK 116 • 1 credit*

Develops basic skills and teaching techniques that enable the recreation leader to provide craft experiences for participants in camps, playgrounds, clubs, and other recreational settings. Laboratory 2 hours per week.

**Alpine Skiing***RPK 209 • 1 credit*

Introduces basic alpine skiing and planning group ski trips. Includes equipment, safety, and basic fundamentals of skiing. Laboratory 2 hours per week.

**Recreation Camping***RPK 215 • 1 credit*

Discusses organizing and running a group camping trip. Includes information on site, food and shelter selection, personal and group safety, packing, and conservation. Emphasizes appreciation of natural resources, outdoor skills, and outdoor living. Laboratory 2 hours per week.

**Recreation Backpacking***RPK 216 • 2 credits*

Discusses the ethical role of the backpacker in terms of conservation and ecology. Includes field experience involving backpacking, orienteering, and trail safety. Required for Recreation and Parks majors. Laboratory 4 hours per week.

**Canoe Camping***RPK 225 • 2 credits*

Introduces the history, techniques, safety, and planning related to canoe operation and camping along a river or on a lake shore. Required for Recreation and Parks majors. Laboratory 4 hours per week.

**Cooperative Education in Recreation Leadership***RPK 297 • 1-5 credits*

Supervised on-the-job training for pay in selected business, industrial or service firms coordinated by the college. Credit/work ratio 1:5 hours. May be repeated for credit. Variable hours per week.

**RELIGION****Survey of the Old Testament***REL 200 • 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.

**Survey of the New Testament***REL 210 • 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.

**Life and Teachings of Jesus***REL 216 • 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.

**Life and Letters of Paul***REL 217 • 3 credits*

Studies the journeys and religious thought of the apostle Paul. Lecture 3 hours per week.

**Religions of the World***REL 230 • 3 credits*

Introduces the religions of the world with attention to origin, history, and doctrine. Lecture 3 hours per week.

**Christianity***REL 246 • 3 credits*

Examines the origins and historical development of Christianity, its basic metaphysical and theological assumptions, its essential doctrines, and the present state of the church in the modern world. Lecture 3 hours per week.

**History of Christianity***REL 247 • 3 credits*

Surveys the development of Christianity from its origins to the present. Lecture 3 hours per week.

**Selected Problems and Issues in Religion***REL 255 • 3 credits*

Examines selected problems and issues of current interest in religion. May be repeated for credit. Lecture 3 hours per week.

**RESPIRATORY THERAPY****Integrated Sciences for Respiratory Care***RTH 102 • 3 credits*

Integrates the application of mathematics, chemistry, microbiology, physics, and computer technology as these sciences apply to the practice of respiratory care. Lecture 3 hours per week.

**Fundamental Theory for Respiratory Care***RTH 120 • 2 credits*

Presents the theory of basic patient assessment and functional medical terminology. Lecture 2 hours per week.

**Cardiopulmonary Science I***RTH 121 • 3 credits*

Focuses on pathophysiology, assessment, treatment, and evaluation of patients with cardiopulmonary disease. Explores cardiopulmonary, renal and neuromuscular physiology and pathophysiology. Lecture 3 hours per week.

**Respiratory Care Theory and Procedures I-II***RTH 131-132 • 4 credits each*

Presents theory of equipment and procedures and related concepts used for patients requiring general, acute, and critical cardiopulmonary care. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**Pharmacology for Respiratory Care I***RTH 145 • 1 credit*

Presents selection criteria for the use of and detailed information on pharmacologic agents used in pulmonary care. Lecture 1 hour per week.

**Coordinated Internship***RTH 190 • 1-5 credits*

Includes supervised practice in selected health agencies coordinated by the college. Credit/practice ratio maximum 1:5 hours. May be repeated for credit. Variable hours per week.

**Pulmonary Rehabilitation***RTH 215 • 1 credit*

Focuses on purpose and implementation of a comprehensive pulmonary rehabilitation program. Lecture 1 hour per week.

**Pulmonary Rehabilitation, Home Care and Health Promotion***RTH 217 • 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. Lecture 2 hours per week.

**Cardiopulmonary Science II***RTH 222 • 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.

**Neonatal and Pediatric Respiratory Procedures***RTH 225 • 3 credits*

Focuses on cardiopulmonary physiology, pathology and application of therapeutic procedures in the management of the newborn and pediatric patient. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Diagnostic and Therapeutic Procedures II***RTH 235 • 3 credits*

Presents the use of multiple diagnostic and therapeutic techniques used in ambulatory and critical care patients. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Critical Care Monitoring***RTH 236 • 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. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Coordinated Internship***RTH 290 • 4 credits*

Includes supervised practice in selected health agencies coordinated by the college. Credit/practice ratio maximum 1:5 hours. May be repeated for credit. Variable hours per week.

**Seminar and Project***RTH 298 • 1 credit*

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. May be repeated for credit. Variable hours per week.

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**SAFETY****Safety and Health Standards: Regulations and Codes***SAF 120 • 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.

**Computer Applications for Technicians***SAF 125 • 4 credits*

Introduces the use of the personal computer with emphasis on technical software for occupational/technical professionals. Lecture 4 hours per week.

**Principles of Industrial Safety***SAF 126 • 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.

**Industrial Safety***SAF 127 • 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.

**Materials Handling, Machinery, Handtools and Control I***SAF 131 • 3 credits*

Examines physical hazards of the environment including power sources, methods of control hazards, storage and materials handling. Examines general safety rules regarding the use of handtools, portable power tools, and machine tools; maintenance, repair and inspection programs to be established, and personal protective equipment to be utilized. Lecture 3 hours per week.

**Safety Program Organization and Administration***SAF 135 • 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 and standards. Lecture 3 hours per week.

**Industrial Safety and Design and Maintenance Management***SAF 136 • 3 credits*

Studies the significant aspects of sites and facility planning, process and equipment layout, transportation facilities, illumination standards and color dynamics. Includes a study of the hazards and conditions involving floors, walkways, ramps, stairs, ladders, mechanical and personal protective equipment, safety maintenance, schedules and controls and their relationship to the prevention of accidents. Lecture 3 hours per week.

**Introduction to Industrial Hygiene***SAF 140 • 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.

**Hazard Communication***SAF 145 • 2 credits*

Develops an understanding of potential toxic chemicals and hazards in the workplace and defines the means by which to recognize, evaluate and control these hazards. Provides an opportunity to develop a training program in compliance with state and federal regulations. Lecture 2 hours per week.

**Protective Equipment***SAF 175 • 2-3 credits*

Provides classroom and field training in safety, selection, handling, and use of respiratory protection devices. Includes suiting and unsuiting procedures. Prerequisite: Medical examination. Lecture 2-3 hours per week.

**Hazardous Metals and Halogenated Compounds***SAF 176 • 1 credit*

Teaches proper work methods for handling, storage, health effects, personal hygiene, disposal and spill response to lead, mercury, halogenated compounds and other hazardous materials in classroom and field settings. Includes instruction in the use of chlorine "A", "B", and "C" kits. Prerequisite: SAF 175. Lecture 1 hour per week.

**Human Factors and Safety Psychology***SAF 205 • 3 credits*

Studies stresses on the human system, both physiological and psychological, that contrib-

ute 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.

**Hazardous Chemicals, Materials, and Waste in the Workplace***SAF 246 • 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.

**Spill Response and Decontamination, Level II***SAF 255 • 3 credits*

Provides classroom instruction and field demonstrations for responders to hazardous spills. Areas of instruction include response vehicles, on-scene command, site security, containment, risk management, emergency evacuation, removal of the hazard and final site inspection. Lecture 3 hours per week.

**SIGN COMMUNICATIONS****Introduction to American Sign Language I***SCM 100 • 3 credits*

Teaches the fundamentals of finger-spelling and American sign language vocabulary. Develops skills for communication with the hearing impaired. Introduces the non-language aspects of communication, including eye movement, facial expression, and body posture. Explores and develops skills in gesture pantomime and body language. Lecture 3 hours per week.

**Introduction to American Sign Language II***SCM 101 • 3 credits*

Provides students with continued instruction in the fundamentals of finger spelling, numbering, American Sign Language structure, and sign language vocabulary. Develops signing skills for communications with people who are deaf and hard of hearing. Incorporates the non-verbal aspects of communications including eye movement, facial expression, and body language. Lecture 3 hours per week.

**Intermediate American Sign Language***SCM 110 • 3 credits*

Provides students with additional American sign language vocabulary. Teaches idiomatic expressions, colloquialisms, and receptive skills. Prerequisite: SCM 100 or consent of the instructor. Lecture 3 hours per week.

**Psychosocial Aspects of Deafness***SCM 125 • 3 credits*

Presents an overview of deafness from physiological as well as cultural perspectives. Studies implications of auditory impairment of children and adults in the areas of language, family relationships, education, socioeconomics, and societal roles. Lecture 3 hours per week.

**ASL-to-English Interpretation I***SCM 133 • 3 credits*

Begins consecutively interpreting monologues from the student's second language to first language. Watch entire ASL monologue, process it, analyze it, then choose appropriate English to match the message. Eventually interpret the monologue into English. Put interpreting theory into practice in a lab environment. Conduct research in the field of interpretation. Develops team interpreting techniques. Interacts with consumers of ASL-English interpretation. Prerequisite: SCM 205. Co-requisite: SCM 134. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**English-to-ASL Interpretation I***SCM 134 • 3 credits*

Develops beginning interpreting skills from the student's first language (English) to second language (ASL). Puts interpreting theory into practice in a lab environment. Focuses on the use of processing time to allow for clearer interpretations. Allows for research into the field of interpretation. Develops team interpretation. Prerequisite: SCM 205. Co-requisite: SCM 133. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Careers in Deafness***SCM 150 • 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.

**Advanced American Sign Language***SCM 200 • 3 credits*

Provides student with additional American Sign Language vocabulary. Emphasizes linguistic aspects of ASL, including classifiers, syntax, locatives, placement, and sentence types. Develops skill in expressive and receptive use of ASL. Prerequisite: SCM 110 or consent of the instructor. Lecture 3 hours. Total 3 hours per week.

**Pre-Interpreting Skills***SCM 205 • 2 credits*

Develops fundamental skills toward the task of interpreting, including, but not limited to: cloze, abstracting, decalage, transcoding, register, and monitoring. Applies skills in extra-linguistic and linguistic scenarios. Review Process Models of Interpreting, and uses one to analyze interpretations. Requires research and develops team interpreting skills. Prerequisite/co-requisite: SCM 200 and SCM 125. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**American Sign Language for Interpreters***SCM 210 • 3 credits*

Provides additional linguistic aspects of American Sign Language. Emphasizes vocabulary, structure and appropriate sign choices for fluency. Applies knowledge of ASL to the interpreting process. Prerequisite SCM 200 or consent of the instructor. Lecture 3 hours per week.

**Interactive Interpretation***SCM 215 • 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. Pre/Co-requisites: SCM 212 and SCM 232 or SCM 233 and SCM 234. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Linguistics of ASL***SCM 220 • 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 and differences between the signed languages and spoken languages in general. Co-requisite: SCM 110. Lecture 3 hours per week.

**Introduction to Interpreting***SCM 230 • 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. Lecture 3 hours per week.

**ASL-to-English Interpretation II***SCM 233 • 3 credits*

Perform simultaneous interpretations from monologues in the student's second language into the first language. 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. Prerequisites: SCM 133, SCM 134. Co-requisite: SCM 234. Lecture 2 hours. Laboratory 3 hours. Total 4 hours per week.

**English-to-ASL Interpretation II***SCM 234 • 3 credits*

Perform simultaneous interpretations from monologues in the student's first language into the second language. 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. Prerequisites: SCM 133, SCM 134. Co-requisite: SCM 233. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Interpreting in the Educational Setting***SCM 235 • 3 credits*

Examines the role, responsibilities, and communication techniques of the Educational Interpreter. Provides information on the nature and needs of the deaf student and methods used in teaching students who are deaf and hard of hearing. Emphasizes skill development in Conceptually Accurate Signed English, CASE. Prerequisites: SCM 200, SCM 230. Lecture 3 hours per week.

**Translation Skills***SCM 240 • 2 credits*

Develops fundamental skills needed for the task of interpreting, including, but not limited to: comprehending source language (either ASL or English), transferring content into memory store (breaking from

## COURSE DESCRIPTIONS

original form), restructuring into target language, maintaining message equivalence. Conveying implicit and inferred information, and applying appropriate discourse structure. Conducts research. Co-requisite: SCM 205. Lecture 2 hours. Laboratory 1 hour. Total 3 hours per week.

**Transliterating I**

*SCM 241 • 3 credits*

Studies the skills required to transmit English into a manual code for English and vice versa. Introduces a variety of manual codes and their relationship to American Sign Language. Prerequisite: SCM 110. Lecture 3 hours per week.

**Language Development of Deaf Children**

*SCM 250 • 3 credits*

Delineates developmental stages of language use of the Deaf. Compares and contrasts ASL use of Deaf children with the use of English by hearing children. Defines issues related to language choice (e.g., ASL vs. English), language proficiency, etc. Identifies individual roles within the Deaf student's IEP team. Pre/Co-requisites: SCM 200, SCM 125, SCM 220. Lecture 3 hours per week.

**Coordinated Internship: ASL-English Interpretation**

*SCM 290 • 5 credits*

Interpret in "safe" environments under the guidance of instructor and mentor. Prerequisites: SCM 233-234. Co-requisite: SCM 215. Laboratory 75 contact hours.

**Seminar and Project: ASL-English Interpretation**

*SCM 298 • 2 credits*

Conduct research in the field of ASL-English Interpretation. Network with Deaf consumers and professional interpreters. Laboratory 30 contact hours.

**SOCIAL SCIENCE****Contemporary American Civilization I-II**

*SSC 201-202 • 3 credits each*

Analyzes factors involved in the development of American society and culture. Applies contents, methods, and insights of anthropology, economics, geography, government/political science, history, psychology and sociology in an integrated sequence of courses. Lecture 3 hours per week.

**SOCIOLOGY****Introduction to Sociology I-II**

*SOC 201-202 • 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.

**Principles of Anthropology I-II**

*SOC 211-212 • 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.

**Sociology of the Family**

*SOC 215 • 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 life-styles. Lecture 3 hours per week.

**Criminology**

*SOC 236 • 3 credits*

Studies research and causal theories of criminal behavior. Examines crime statistics, crime victims, and types of criminal offenses. Introduces the role of police, judicial and correctional systems in treatment and punishment of offenders. Is also approved for ADJ Criminology curriculum. Lecture 3 hours per week.

**Sociology of Aging**

*SOC 245 • 3 credits*

Introduces study of aging with special emphasis on later stages of the life cycle. Includes theories of aging, historical and comparative settings, social policy, and future trends of aging. Lecture 3 hours per week.

**Death and Society**

*SOC 246 • 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.

**Society and Mass Communication**

*SOC 254 • 3 credits*

Studies the functions and societal effects related to the development of mass communication in America. Emphasizes current media trends including ethics and the global impact of American mass media. Lecture 3 hours per week.

**Social Problems**

*SOC 268 • 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.

**Social Institutions Through Photography**

*SOC 269 • 3 credits*

Studies social institutions (family, education, religion, politics, economics) and social movements, such as the Civil Rights Movement, by combining sociological concepts and documentary photography. Lecture 3 hours per week.

**Cooperative Education in Sociology**

*SOC 297 • 1-5 credits*

Supervised on-the-job training for pay in selected business, industrial or service firms coordinated by the college's Cooperative Education Office. Credit/work ratio 1:5 hours. May be repeated for credit. Variable hours per week.

**SPANISH****Beginning Spanish I-II**

*SPA 101-102 • 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.

**Intermediate Spanish I-II**

*SPA 203-204 • 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****Principles of Public Speaking***SPD 100 • 3 credits*

Applies theory and principles of public address with emphasis on preparation and delivery. Lecture 3 hours per week.

**Oral Communication***SPD 105 • 3 credits*

Studies effective communication with emphasis on speaking and listening. Lecture 3 hours per week.

**Voice and Diction I***SPD 111 • 3 credits*

Enables students to improve pronunciation, articulation, and voice quality. Includes applied phonetics. Lecture 3 hours per week.

**Interpersonal Communication***SPD 126 • 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.

**Introduction to the Theatre***SPD 130 • 3 credits*

Surveys the principles of drama, the development of theatre production, and selected plays to acquaint the student with various types of theatrical presentations. Lecture 3 hours per week.

**Acting I-II***SPD 131-132 • 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.

**Stage Movement***SPD 135 • 3 credits*

Presents the theory and practice of body movement as it relates to theatre production. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

**Theatre Workshop***SPD 136 • 1-6 credits*

Enables students to work in various activities of play production. The student participates in performance, set design, stage carpentry, sound, costuming, lighting, stage

managing, props, promotion, or stage crew. May be repeated for credit. Lecture 6 hours per week.

**Oral Interpretation***SPD 137 • 3 credits*

Studies the theory and practice of performing various types of literature: prose, poetry, and drama. Emphasizes the relationship among the oral interpreter, the literary work, and the audience. Lecture 3 hours per week.

**Theatre Appreciation I-II***SPD 141-142 • 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.

**Stagecraft***SPD 145 • 3 credits*

Acquaints the student with fundamental methods, materials, and techniques of set construction for the stage. Lecture 2 hours. Laboratory 2 hour. Total 4 hours per week.

**Film Appreciation I-II***SPD 151-152 • 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.

**Advanced Public Speaking***SPD 200 • 3 credits*

Focuses on preparation and delivery of various advanced forms of public address. Prerequisite SPD 100 or divisional approval.

**Intercultural Communication***SPD 229 • 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.

**History of Theatre I-II***SPD 231-232 • 3 credits each*

Analyzes and studies theatre history to include architecture, performers and performance, playwrights, stage, production methods, and audience from the Greeks through modern drama. Lecture 3 hours per week.

**Rehearsal and Performance I-II***SPD 233-234 • 3 credits each*

Explores various aspects of the theatre through involvement in college theatre production. Variable hours per week.

**Basic Set Design***SPD 240 • 3 credits*

Studies basic techniques and methods of scenic design for the stage. Lecture 3 hours per week.

**Introduction to Directing I-II***SPD 241-242 • 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.

**Stage Make-Up***SPD 249 • 1 credit*

Presents principles and practice of make-up for the stage. Lecture 1 hour per week.

**Outdoor Drama***SPD 266 • 1-6 credits*

Enables students to study production techniques through participation as actors or technicians in outdoor drama. Prerequisite: divisional permission. Variable hours per week.

**Creative Drama***SPD 267 • 3 credits*

Explores uses of drama through story dramatization, role-playing, and sensory exercises. Lecture 3 hours per week.

**Theatre Apprenticeship/Internship***SPD 285 • 1-6 credits*

Enables students to learn production techniques through participation as apprentices or interns at a professional theatre. Prerequisite: divisional permission. Variable hours per week.

**STUDENT DEVELOPMENT**

**Orientation**

*STD 100 • 1 credit*

Assists students in transition to college. Provides over-views of college policies, procedures, 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.

**Orientation to (Specific Disciplines)**

*STD 101 • 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.

**Study Skills**

*STD 104 • 1 credit*

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 1 hour per week.

**Preparation for Employment**

*STD 106 • 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 STD 100. Lecture 1 hour per week.

**Career Education**

*STD 107 • 1 credit*

Surveys career options available to students. Stresses career development and assists in understanding of self in the world of work. Assists students in applying decision - mak-

ing to career choice. Lecture 1 hour per week.

**College Survival Skills**

*STD 108 • 1 credit*

Provides an orientation to the college. Introduces study skills, and career and life planning. Offers an opportunity to engage in activities of 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 1 hour per week.

**TRUCKING**

**DOT Safety Rules and Regulations**

*TRK 101 • 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. Corequisite TRK 102. Lecture 2 hours per week.

**Preventive Maintenance for Truck Drivers**

*TRK 102 • 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. Corequisite: TRK 101. Lecture 1 hour per week.

**WELDING**

**Fundamentals of Welding**

*WEL 100 • 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.

**Oxyfuel Welding and Cutting**

*WEL 117 • 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.

**Introduction to Welding**

*WEL 120 • 2 credits*

Introduces history of welding processes. Covers types of equipment and assembly of units. Stresses welding procedures such as fusion, non-fusion, and cutting oxyacetylene. Introduces arc welding. Emphasizes procedures in the use of tools and equipment. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Shielded Metal Arc Welding (Basic)**

*WEL 123 • 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.

**Shielded Metal Arc Welding (Advanced)**

*WEL 124 • 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.

**Pipe Welding I-II**

*WEL 126-127 • 3 credits each*

Teaches arc welding processes including the welding of pressure piping in the horizontal, vertical and horizontal fixed positions in accordance with cores and standards. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

**Gas Shielded Processes I**

*WEL 135 • 2 credits*

Introduces practical operations in the use of gas shielded arc welding. Studies equipment operation, setup, safety and practice of gas shielded processes. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Gas Shielded Processes II**

*WEL 136 • 2 credits*

Studies Tungsten and metallic gas procedures and practices including principles of operation, shielding gases, filler rods, process variations and applications, manual and semiautomatic welding, equipment and safety. Lecture 1 hour. Laboratory 3 hours. Total 4 hours per week.

**Pipe and Tube Welding***WEL 138 • 2 credits*

Develops entry level skills for the inert gas tungsten arc welding process (TIG) with emphasis on thin and thick wall carbon and stainless steel piping and tubing. Lecture 1 hours. Laboratory 3 hours. Total 4 hours per week.

**Welder Qualification Tests I-II***WEL 141-142 • 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.

**Welding Drawing and Interpretation***WEL 150 • 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.

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