



Course Descriptions



ACCT 090 Introduction to Accounting **3 Credits**

Prerequisites: None. Introduces the basic principles of accounting as utilized in a variety of office settings. Includes the principles of debit and credit, double-entry bookkeeping, use of journals, and analyzing transactions. Uses of ledgers, posting procedures, petty cash, banking procedures, payroll, depreciation, work sheets, balance sheets, and income statements are covered as well.

ACCT 101 Financial Accounting **TransferIN 3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095, and MATH 023 or higher. Introduces the fundamental principles, techniques, and tools of financial accounting. The development and use of the basic financial statements pertaining to corporations both service and retail.

ACCT 102 Managerial Accounting **TransferIN 3 Credits**

Prerequisites: ACCT 101. Emphasizes managerial accounting concepts, general versus cost accounting systems, cost behavior, cost-volume profit analysis, standard cost systems, responsibility accounting, incremental analysis, and capital investment analysis.

ACCT 106 Payroll Accounting **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095 and MATH 023 or higher. Covers payroll calculating and reporting including various federal and state withholding taxes, employer payroll taxes, typical insurance and other arrangements affecting the preparation of payroll registers and employee earning records.

ACCT 118 Financial Concepts for Accounting **3 Credits**

Prerequisites: None. Surveys the applications of mathematics to various business and accounting activities. Includes a review of basic mathematical operations and their subsequent application to such commercial activities as payroll, consumer finance, business borrowing, inventory control, pricing, depreciation, and time value of money.

ACCT 122 Accounting Systems Applications **3 Credits**

Prerequisites: ACCT 101. Solves accounting problems using software similar to what is currently used in business. Includes installation, operation, and analysis of an accounting software package or packages. Includes installation and operation of Quickbooks.

ACCT 201 Intermediate Accounting I **3 Credits**

Prerequisites: ACCT 101. Studies accounting principles and applications at an intermediate level pertaining to the income statement and balance sheet, cash and cash equivalents, receivables, inventories, plant assets and intangible assets, current and contingent liabilities, corrections of errors, and statement of cash flows. Included are analysis of bad debts, inventory valuation, repairs and maintenance, depreciation of plant assets and present value applications.

ACCT 202 Intermediate Accounting II **3 Credits**

Prerequisites: ACCT 201. Continues studies of Intermediate Accounting I and includes long-term investments, long-term debt, stockholders' equity, special accounting problems and analysis, and financial statement analysis. Also included are corporate capital and treasury stock transactions, dividends, earnings per share, accounting for income taxes, and creation of financial statements from incomplete records.

ACCT 203 Cost Accounting I **3 Credits**

Prerequisites: ACCT 102. Examines the manufacturing process in relation to accumulation of specific costs of manufactured products. Studies various cost accounting report forms, material, labor control, and allocation of manufacturing costs to jobs and departments.

ACCT 204 Cost Accounting II **3 Credits**

Prerequisites: ACCT 203. Studies the master or comprehensive budget, flexible budgeting and capital budgeting. Emphasizes tools for decision-making and analysis. Introduces human resource accounting.

ACCT 205 Income Tax **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095, and MATH 023 or higher. Offers an overview of federal and state income tax law for individuals including taxable income, capital gains and losses, adjustments, standard and itemized deductions, tax credits and appropriate tax forms. Introduces tax concepts needed by a sole proprietorship.

ACCT 207 Accounting for Government and Nonprofit Entities **3 Credits**

Prerequisites: ACCT 101. Emphasizes the similarities and differences between government, nonprofit and commercial accounting methods and procedures. Exposes students to the basic fund accounting cycle for the general fund and other special funds.

ACCT 208 Advanced Income Tax **3 Credits**

Prerequisites: ACCT 101 and ACCT 105. Studies procedures and problems pertaining to federal and state income tax laws for partnerships and corporations. Includes a review and in-depth study of concepts related to proprietorships covered in Income Tax.

ACCT 209 Auditing**3 Credits**

Prerequisites: ACCT 201. Covers public accounting organization and operation including internal control, internal and external auditing, verification and testing of the balance sheet and operating accounts, and the auditor's report of opinion of the financial statements.

ACCT 210 Forensic Accounting**3 Credits**

Prerequisites: ACCT 101. Introduces the fundamental principles, techniques, and tools of forensic accounting. The development and use of proactive and reactive fraud auditing including audit committee and liability-related issues: investigative decision making for prevention, detection, investigation, and reporting of fraud.

ACCT 223 Enrolled Agent Review**3 Credits**

Prerequisites: ACCT 208. Corequisites: ACCT 208. This course is a preparation course for the enrolled agent examination. The course will include identifying the requirements, practices, procedures and liabilities of an enrolled agent. Additionally, a review of accounting ethics, individual taxation, business taxation, representation of the client will be presented in the course.

ACCT 225 Integrated Accounting Systems**3 Credits**

Prerequisites: ACCT 101. Uses integrated accounting software package, Sage 50 (formerly known as Peachtree), to illustrate computerized accounting practices. The general ledger will be integrated with accounts receivable, accounts payable, and other accounting modules.

ACCT 273 Volunteer Income Tax Assistance (VITA) Service**3 Credits**

Prerequisites: Successful completion of ACCT 105 and IRS VITA Certifications at both Basic and Advanced Levels. This volunteer program prepares students to process both federal and state income tax returns for eligible citizens. Students will complete an IRS-developed VITA training program for two levels of service – Basic and Advanced. This level of training will permit the volunteer to prepare most individual tax returns. Student volunteers will be required to successfully pass the IRS VITA Certification Tests for two levels of tax preparation service. Once certified, student volunteers will conduct interviews with VITA clients, prepare both the federal and state tax returns using IRS eFile software, and undergo a Quality Review Process to ensure accurate and acceptable tax returns for electronic filing in addition to providing tax information and tax law to VITA clients.

ACCT 279 Capstone Course**2 Credits**

Prerequisites: ACCT 102 and BUSN 101 and ENGL 111 and OFAD 218. Corequisite: ACCT 102. Prepare the student for entry into the accounting field. Reviews procedures for interviewing, resume writing, job search techniques, team participation, ethics, and productive job performance. Provides for taking outcomes assessments.

ACCT 280 Co-op/Internship**3 Credits**

Prerequisites: Program Chair Approval. Provides students with the opportunity to work at a job site that is specifically related to their career objectives. Provides on-the-job experience while earning credit toward an associate degree.

ACCT 281-294 Special Topics**1-3 Credits**

Prerequisites: Program Advisor Approval. Discusses topics of current interest in accounting. Identifies and offers various special topics during each term under this course number.

ADMF 101 Key Principles of Advanced Manufacturing (MSSC)**3 Credits**

Prerequisites/Corequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071. Introduces the basic principles and practices of Safety and Quality used in manufacturing environments. Safety instruction covers topics including; Material Safety Data Sheets (MSDS), confined space, lock out/tag out, zero energy state, hazardous materials, storage of flammable materials, storage of fuel gas and high pressure gas cylinders, portable powered tool safety, hand tool safety, record keeping, training, employer enforcement of safety regulations, and right to know. This course also covers current quality control concepts and techniques in industry with emphasis on modern manufacturing requirements. Topics of instruction include basic statistical and probability theory, sampling techniques, process control charts, nature of variation, histograms, attributes and variable charts. This course will use lecture, lab, online simulation and programming to prepare students for Certified Production Technician Testing through Manufacturing Skill Standards Council (MSSC). In addition, this course will also include an online OSHA 10 hour certification program in which successful completion results in students earning their OSHA 10 hour General Industry certification.

ADMF 102 Technology in Advanced Manufacturing (MSSC)**3 Credits**

Prerequisites/Corequisites: ADMF 101. Introduces manufacturing processes and basic mechanical, electrical, and fluid power principles and practices used in manufacturing environments. Topics include; types of production, production materials, machining and tooling, manufacturing planning, production control, and product distribution will be covered. Students will be expected to understand the product life cycle from conception through distribution. This course also focuses on technologies used in production processes. Basic power systems, energy transfer systems, machine operation and control will be explored. This course will use lecture, lab, online simulation and programming to prepare students for Certified Production Technician Testing through Manufacturing Skill Standards Council (MSSC).

ADMF 106 Supervision and Teams at Work

3 Credits

Prerequisite: None. Introduces basic employee development with emphasis on the responsibilities of a newly-appointed supervisor. Emphasizes organizational structure, motivation, delegation of authority, interviews, orientation and induction of new employees, employee performance evaluations, and dealing with employee conflict.

ADMF 109 Green Manufacturing Operations

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 or FOUN 071. Introduces the basic concepts of restructuring the manufacturing workplace and technological activity to incorporate environmental concerns. This course serves as an introduction to the basic principles of "green" manufacturing.

ADMF 112 Mechatronics I

3 Credits

Prerequisites/Corequisites: INDT 203. This course covers the basics of mechanical components and electrical drives in a complex mechatronic system. Based upon a physical system, students will learn the basic functions and physical properties of mechanical components as well as electrical drives (AC and DC), and the roles they play within the system. They will also learn about mechanical components which lead and support the energy through a mechanical system to increase efficiency and to reduce wear and tear. Materials, lubrication requirements and surface properties will be examined. Technical documentation such as data sheets and specifications of mechanical elements and electrical drives will also be covered. By understanding the interworkings of the complete system, students will learn and apply troubleshooting strategies to identify, localize and (where possible) to correct malfunctions. Preventive maintenance of mechanical elements and electrical drives as well as safety issues within the system will be discussed.

ADMF 116 Automation and Robotics in Manufacturing I

3 Credits

Prerequisites: INDT 113. Introduces the basic theory, operation, and programming of automated manufacturing systems. The course will focus on three main types of manufacturing automation including; Programmable Logic Controllers (PLC), Computer Numerically Controlled Machines (CNC), and Robotics. Students will be required to design, program and troubleshoot computer controlled machine logic and production processes in a project oriented learning environment.

ADMF 118 World Class Manufacturing

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 or FOUN 071. Introduces the basic concepts of manufacturing operations management and production control activity. This course serves as an introduction to the effective use of the principles of manufacturing competitiveness, company profitability, and superior customer service.

ADMF 119 Logistics in Manufacturing

3 Credits

Prerequisite: None. Introduces students to the various components of logistics with emphasis on how logistics relate to manufacturing operations. Topics will include logistics systems, supply chain management, order, demand inventory and warehouse management, and the control systems and automated components of logistics systems. Logistics concepts are approached from a manufacturing perspective with a focus on system integration and automation and lean manufacturing applications. This course incorporates mandatory certification assessment for the Manufacturing Skills Standards Council (MSSC) Certified Logistics Associate (CLA) and Manufacturing Skills Standards Council (MSSC) Certified Logistics Technician (CLT) certifications.

ADMF 122 Mechatronics II

3 Credits

Prerequisites/Corequisites: INDT 113. This course covers the basics of electrical components in a complex mechatronic system including robotic automation. Based upon a physical system, students will learn the basic functions and physical properties of electrical components, and the roles they play within the system. Technical documentation such as data sheets, schematics, timing diagrams, robotic programs and system specifications will also be covered. By understanding the complete system, the flow of energy through the system and measurements on the components, students will learn and apply troubleshooting strategies to identify, localize and (where possible) to correct malfunctions. Preventative maintenance and safety issues for electrical components within the system will be discussed.

ADMF 201 Lean Manufacturing

3 Credits

Prerequisite: None. Introduces the philosophical background, historical development, fundamental concepts, operating fundamentals, and the organizational rationale for the implementation of lean disciplines in manufacturing. The course also applies to the application of lean disciplines and concepts to service and support industries. The use and implementation of lean disciplines has generally resulted in the ability of an enterprise to develop a work environment that promotes continuous improvement, eliminates waste, reduces operating cost, improves quality, and achieves measurable improvement in customer satisfaction.

ADMF 202 Automation – Mechatronics Advanced Control Systems

3 Credits

Prerequisites: ADMF 112, and ADMF 122, ADMF 222. Corequisites: ADMF 222. This course covers the fundamentals of digital logic and an introduction to programmable logic controllers (PLCs) in a complex mechatronic system with a focus on the Siemens automation controller and the appropriate programming software. Using computer simulation, and Siemens automation controllers, students will learn the role PLCs play within a mechatronic system or subsystem. They will also learn basic elements of PLC functions by writing small programs and testing these programs on an actual system. Students will learn to identify malfunctioning PLCs, as well as to apply troubleshooting strategies to identify and localize problems caused by PLC hardware. In addition, this course will prepare students to take nationally recognized certification exam(s).

ADMF 205 Sensors in Manufacturing

3 Credits

Prerequisites: ADMF 113 or INDT 113. Introduces the basic principles and practices of sensor technology used in advanced manufacturing. This course will prepare students to utilize commonly used sensor technology from simple switches to complex modern sensors. Students will be required to match appropriate sensor technology with specific manufacturing processes.

ADMF 206 Automation and Robotics in Manufacturing II

3 Credits

Prerequisites: ADMF 116. Continues to develop the theory, operation, and programming of automated manufacturing systems. This course will focus on three main types of manufacturing automation including: Programmable Logic Controllers (PLC), Computer Numeric Controlled Machines (CNC), and Robotics. Students will be required to integrate and troubleshoot computer controlled machines in a manner that represents actual advanced manufacturing production processes in a project oriented learning environment.

ADMF 211 Quality Systems in Manufacturing

3 Credits

Prerequisite: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 035 or MATH 043 or FOUN 071. Covers current quality improvement and techniques in industry with emphasis on modern manufacturing requirements. This course introduces the fundamental tools of Statistical Process Control (SPC) as they are used in industry to reduce costs, identify root cause, and increase productivity at a predictable quality level. Applied principles and techniques of total quality systems will be utilized to ensure correct definition, measurement, analysis, and improvement of common manufacturing problems. Areas of study include: basic statistical and probability theory, sampling techniques, process control charts, nature of variation, histograms, attributes and variable charts.

ADMF 222 Automation – Mechatronics Pressurized Systems

3 Credits

Prerequisites/Corequisites: INDT 104. This course covers the basics of pneumatic, electro pneumatic and hydraulic control circuits in a complex mechatronics system. Students will learn the functions and properties on control elements based upon physical principles, and the roles they play within the system. Technical documentation such as data sheets, circuit diagrams, displacement step diagrams and function charts will also be covered. By understanding and performing measurements on the pneumatic and hydraulic control circuits, students will learn and apply troubleshooting strategies to identify, localize and (where possible) to correct malfunctions. Preventive maintenance of (electro) pneumatic and hydraulic components as well as safety issues within the system will be discussed.

ADMF 226 Automation and Robotics in Manufacturing III

3 Credits

Prerequisites: ADMF 206. Continues the study of advanced industrial automation and robotic topics including safety, vision programming, motion programming, work cell integration, non-motion programming, and robot communications. The course will focus on project management, financial considerations pertaining to an automated work cell, and teamwork principles, as well as automated work cell design and applications where robots are used in industry. Students will also learn to properly maintain an industrial robotic arm.

AGRI 100 Introduction to Agriculture

3 Credits

Prerequisites: None. Presents an overview of agriculture emphasizing the diversity of agricultural careers including crop production, forestry and horticulture, as well as large and small animal production for meat, milk, wool and companionship.

AGRI 101 Agricultural Data Management

3 Credits

Prerequisites: None. Principles of collecting, managing, and retrieving financial, physical, and spatial data from farm operations to support the farm's decision-making and reporting. Emphasizes use of financial, statistical and logical spreadsheet functions, GIS systems, record-keeping for fertilizer and pesticide usage and regulation, and specialized software applications, including integration of information from various sources and packages. This course incorporates mandatory OSHA 10 certification program in which successful completion results in students earning their OSHA 10 General Industry certification.

AGRI 102 Agricultural Business and Farm Management

3 Credits

Prerequisites: None. Deals with vast and complex business of agriculture; emphasizes modern business and farm production methods along with current management and administrative strategies needed for success in an agricultural business.

AGRI 103 Animal Science

3 Credits

Prerequisites: None. An introduction to animal science in agriculture including livestock species, breeds, and production methods.

AGRI 104 Food Source

3 Credits

Prerequisites: None. Provides an overview of the principles of agricultural food science and its importance in securing a safe, nutritious food supply. Emphasis is placed on the principles of food chemistry, nutrition, preservation, packaging, regulations, and careers in the agricultural food science industry. Laboratory experimentation and problem solving are used to enhance student learning in this course.

AGRI 105 Plant and Soil Science

3 Credits

Prerequisites: None. An introduction to plant biology and soil science.

AGRI 106 Agriculture Mechanization

3 Credits

Prerequisites: None. Agriculture Mechanization lab intensive course in which students develop an understanding of basic principles of selection, operation, maintenance, and management of agricultural equipment in concert with the utilization of technology. Topics covered include: safety, electricity, plumbing, concrete, carpentry, welding, engines, emerging technologies, and career opportunities in the area of agriculture mechanization.

AGRI 107 Advanced Animal Science

3 Credits

Prerequisites: None. Investigates concepts to understand animal life and science as it pertains to agriculture. Includes instruction and laboratories to recognize concepts associated with animal taxonomy, life at the cellular level, organ systems, genetics, evolution, ecology, and historical and current issues in animal agriculture.

AGRI 108 Advanced Food Science

3 Credits

Prerequisites: AGRI 104. This is a standards-based, interdisciplinary science course that integrates biology, chemistry, and microbiology in the context of foods and the global food industry.

AGRI 109 Advanced Plant and Soil Science

3 Credits

Prerequisites: None. Investigates concepts of plants and soils as they pertain to the agricultural sciences. Students recognize how plants are classified, grown, function and reproduce. Students will explore plant genetics and the use of plants by humans. They will examine plant evolution and the role of plants in ecology. Student will also investigate through laboratory and fieldwork how plants and soils interact in a dynamic system.

AGRI 110 Introductory Agricultural Business and Economics

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095; or ENGL 063 and ENGL 073 or ENGL 075; and MATH 080 or MATH 023. Examines the role and characteristics of farm and off-farm agricultural business in our economy; introductory economic and business principles involved in successful organization, operation, and management.

AGRI 111 Introduction to Crop Production

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095; or ENGL 063 and ENGL 073 or ENGL 075; and MATH 080 or MATH 023. Introduces and examines fundamental principles of crop production and distribution. Emphasis is placed on applying technological advances in agronomy to active crop-production situations, including basic soils, agricultural meteorology, and crop physiology and breeding.

AGRI 112 Fundamentals of Horticulture

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095; or ENGL 063 and ENGL 073 or ENGL 075; and MATH 080 and MATH 023. Examines the biology and technology involved in the production, storage, processing, and marketing of horticultural plants and products. Laboratories include experiments demonstrating both the theoretical and practical aspects of horticultural plant growth and development.

AGRI 113 Introduction to Animal Science

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095; or ENGL 063 and ENGL 073 or ENGL 075; and MATH 080 or MATH 023. Examines the importance of livestock in the field of agriculture, and the place of meats and other animal products in the human diet.

AGRI 114 Introduction to Agricultural Systems

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095; or ENGL 063 and ENGL 073 or ENGL 075; and MATH 080 or MATH 023. An introduction to the Agricultural Systems Management technical curriculum. Basic mathematical problem solving techniques; power generation, transfer, and utilization; basic principles of agricultural operations management; soil and water management, crop handling and conditioning, and heat transfer.

AGRI 115 Natural Resources Management

3 Credits

Prerequisites: None. Problems associated with the use/misuse of our natural resources and current management practices associated with the conservation of natural resources

AGRI 116 Survey of Horticulture

3 Credits

Prerequisites: None. Presents an overview of horticulture emphasizing the basic concepts of ornamental plant ID, production, and use in the landscape.

AGRI 117 Soil Science

3 Credits

Prerequisites: None. Classification and characterization of soils and differences between soils, including physical, chemical, and biological properties. Relation of soils to land use and tillage, erosion, drainage, moisture supply and aeration practices. Relationship of soil properties to plant nutrition and to fertilizer chemistry, use, and management.

AGRI 119 Sustainable & Alternative Energy **3 Credits**

Prerequisites: None. This course broadens a student's understanding of environmentally friendly energies. In this course, students will use a combination of classroom, laboratory, and field experiences to analyze, critique, and design alternative energy systems. Class content and activities center on renewability and sustainability for our planet. Topics covered in this course include the following types of alternative energies: solar, wind, geothermal, biomass and emerging technologies.

AGRI 121 Agriculture Leadership I **2 Credits**

Prerequisites: None. To prepare students to develop communication skills and Parliamentary Procedure abilities.

AGRI 123 Agriculture Leadership III **2 Credits**

Prerequisites: None. To prepare students to develop written materials to describe and promote the agriculture industry.

AGRI 124 Agriculture Leadership IV **2 Credits**

Prerequisites: None. To prepare students to develop programs and activities used within the agriculture industry.

AGRI 125 Agriculture Leadership II **2 Credits**

Prerequisites: None. To prepare students to develop communication skills about the agriculture industry.

AGRI 128 Agricultural Safety **3 Credits**

Prerequisites: None. Agriculture has high rates of fatalities and serious injuries and ranks among the most dangerous professions in the United States. Educating personnel to operate machinery safely and use protective equipment correctly can help reduce the high number of accidents and lower risk liability. This course presents an overview of safety principles as applied to production agriculture.

AGRI 141 Evaluation of Midwestern Soils **1 Credit**

Prerequisites: None. This course teaches students how to evaluate soils of the Midwestern United States based on soil texture, color, structure, parent material, consistency, runoff, and drainage. After characterizing the soil, the student interprets the data to determine the suitability of the soil for agricultural and engineering purposes.

AGRI 142 Evaluation of Eastern Soils **1 Credit**

Prerequisites: None. This course teaches students how to evaluate soils of the Eastern United States based on soil texture, color, structure, parent material, consistency, runoff, and drainage. After characterizing the soil, the student interprets the data to determine the suitability of the soil for agricultural and engineering purposes.

AGRI 143 Evaluation of Southern Soils **1 Credit**

Prerequisites: None. This course teaches students how to evaluate soils of the Southern United States based on soil texture, color, structure, parent material, consistency, runoff, and drainage. After characterizing the soil, the student interprets the data to determine the suitability of the soil for agricultural and engineering purposes.

AGRI 144 Evaluation of Western Soils **1 Credit**

Prerequisites: None. This course teaches students how to evaluate soils of the Western United States based on soil texture, color, structure, parent material, consistency, runoff, and drainage. After characterizing the soil, the student interprets the data to determine the suitability of the soil for agricultural and engineering purposes.

AGRI 151 Meat Evaluation I **2 Credits**

Prerequisites: None. Principles of livestock evaluation, calculation of meat animal composition, and determine marketing of various livestock species for branded and commodity trade.

AGRI 152 Meat Evaluation II **2 Credits**

Prerequisites: None. Principles of livestock evaluation, calculation of meat animal composition, and determine marketing of various livestock species for branded and commodity trade.

AGRI 153 Livestock Selection I **2 Credits**

Prerequisites: None. Prepares students to participate in livestock judging competitions. Consists of lecture and labs that will develop student's potential in selection of beef, swine, and sheep through login with oral reasoning.

AGRI 154 Livestock Selection II **2 Credits**

Prerequisites: None. Prepares students to participate in livestock judging competitions. This course is designed to teach livestock visual evaluation and interpret production data for different management scenarios. In addition, students will enhance their logical thinking, reasoning, and communication skills.

AGRI 163 Wine Production & Appreciation **3 Credits**

Prerequisites: None. Tasting, training the palate, pairing wines with foods, wine appreciation, grape varieties, growing, and home/commercial production are all covered in this course. The objective of this course goes beyond excellent training in wine selection.

AGRI 164 Landscape Design I **3 Credits**

Prerequisites: None. An introduction to designing residential and commercial landscapes. Emphasis is placed on the plants and features of landscapes that are best adapted to Midwestern environments.

AGRI 165 Turf Science **3 Credits**

Prerequisites: AGRI 100. A study of the grass species and cultural conditions that contribute to healthy lawns and athletic fields in the Midwest.

AGRI 192 International Agricultural Field Experience **3 Credits**

Prerequisites: None. Role of agriculture in international food production, international trade, governmental policy, and cultural and economic diversity influence on agriculture; requires a supervised international field experience.

AGRI 193 United States Agricultural Field Experience **3 Credits**

Prerequisites: None. Role of agriculture in U.S. food production, national trade, governmental policy, and cultural and economic diversity influence on agriculture; requires a supervised national field experience.

AGRI 200 Precision Farming Technology **3 Credits**

Prerequisites: None. Technology and applications of electronics for precision agriculture. Characteristics of personal computer hardware, electronic sensors, monitors, machine controllers, environmental monitors, and global positioning systems. Production management information systems; processing and marketing information systems; and yield mapping, geographic information system data handling, and software options.

AGRI 201 Communicating Across Cultures **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095; or ENGL 063 and ENGL 073 or ENGL 075; and MATH 080 or MATH 023. Presents an academic overview of the field of multicultural education as it relates to the agriculture industry. The course will explore the great variety of differences that exist among people living in the multicultural, multiethnic, multinational United States, as well as the world. Differences to be studied include race/ethnicity, gender identity, age, social class, disability, learning styles, and spiritual orientation. Issues of poverty, language, and social justice will also be examined.

AGRI 202 Animal Production Facilities **3 Credits**

Prerequisites: None. Examines the principles of designing, choosing and operating housing and equipment for animal production. Special focus on operator, and animal safety and well-being as well as environmental quality management

AGRI 203 Livestock Selection and Evaluation **3 Credits**

Prerequisites: None. This course is designed to teach livestock visual evaluation, determine grading and marketing of livestock species, and interpret production data for different management scenarios. In addition, students will enhance their logical thinking, reasoning, and communication skills.

AGRI 204 Agriculture Salesmanship **3 Credits**

Prerequisites: None. Role, dynamics, and principles of sales communications as related to food and agriculture; methods for analyzing, setting objectives, planning, conducting, and evaluating sales communications efforts; sales presentations.

AGRI 205 Animal Nutrition **3 Credits**

Prerequisites: None. Principles of animal science related to nutrient function, deficiency symptoms, digestive process, feedstuffs, and ration balancing for livestock and companion animals.

AGRI 206 Animal Anatomy and Physiology **3 Credits**

Prerequisites: None. Principles of organ and tissue structure, operation, function, regulation, and integration of domestic farm animals. Examines mechanisms and processes of growth and development, reproduction, and lactation, and effects of environmental conditions. Includes basic genetic principles and theory, and their applications to physiological development and reproduction.

AGRI 207 Agricultural Marketing **3 Credits**

Prerequisites: None. Includes principles of demand, supply and price determination in agricultural markets. Examines effects of costs and margins, market structure, marketing channels and systems, horizontal and vertical integration, government regulations, government programs, and cooperatives on farm marketing decisions. Also examines the difference between marketing commodities and differentiated products.

AGRI 208 Agriculture Financial Records

3 Credits

Prerequisites: None. Application of principles of financial and cost accounting, finance, and management to recording the farm's input, cost, production, price, and revenue information. Use and organization of financial data to assist farm management and decision-making, such as financial analysis, budgeting, strategic decisions for evaluating and improving operations, credit needs, and tax liabilities.

AGRI 209 Agricultural Commodity Marketing

3 Credits

Prerequisites: None. Fundamentals of the mechanics of commodity futures and options for both grain and livestock. Examine how these markets connect to the cash market and influence risk management and pricing of commodities. Fundamentals of the cash market pricing alternatives available and development of marketing plans.

AGRI 210 Management Methods for Agricultural Business

3 Credits

Prerequisites: AGRI 110. Examines the management of non-farm, agriculturally related businesses. Topics include tools for management decision making, legal forms of business organization, basics of accounting, and important financial management techniques. Incorporates case studies and computer simulation game.

AGRI 211 Swine Production

3 Credits

Prerequisite: AGRI 100. The principles, skills, and practices of handling swine and managing commercial swine production and production of pork products. Includes breeding, selection, feeding, and health of swine. Provides concepts of animal and animal-human interactions and animal behavior and practices to ensure animal and human well-being.

AGRI 212 Environmental Systems Management

3 Credits

Prerequisite: AGRI 100. Principles of using, storing, controlling and disposing of agricultural waste, chemicals, and other hazardous materials, and using and maintaining application equipment, to maintain human and animal health and environmental quality. Includes basis for and knowledge of state and federal regulatory requirements. May include instruction for certification in hazardous materials management or private pesticide applicator licensing.

AGRI 213 Agriculture Equipment Power Systems

3 Credits

Prerequisites: None. Presents and in-depth examination of the agricultural application of the principles of diesel engines and hydraulic systems. The course also examines manual, automatic and hydrostatic transmissions found in agricultural equipment.

AGRI 214 Physiology of Animal Reproduction

3 Credits

Prerequisites: None. Successful and efficient reproduction is an economically important aspect of modern animal agriculture. Course emphasizes the anatomy of male and female food animal reproductive organs, the effect of hormones on reproduction, the effect of environmental factors on reproduction, and the ways to maximize reproductive efficiency. Includes basics of genetics, but emphasizes the practical application of reproductive physiology.

AGRI 216 Disease and Insect Identification and Control

3 Credits

Prerequisites: None. Identification and control of the economically important diseases and insects that impact agricultural production in the U.S. Emphasis is placed on disease pathogens and insects that affect grain and forage production in the Midwest. Current technologies in chemical control as well as integrated pest management will be explored with emphasis on environmental and personal safety.

AGRI 217 Soil Fertility

3 Credits

Prerequisites: None. Use of fertilizers for peak production at optimum cost; evaluation and comparison of different forms of macro – and micro-nutrients, their manufacture, handling, and application; plant and soil chemistry.

AGRI 218 Weed Identification and Control

3 Credits

Prerequisites: None. Identification and control of the economically important broadleaf and grass weeds that impact agricultural production in the U.S. Identification of seeds, seedlings and full-grown plants is addressed. Weed control programs are examined in the context of herbicide chemistry, timing and economics. Emphasis is placed on pesticide formulations, application methods, rate calibration, environmental concerns, safety, laws and regulations. Students will participate in training for and receive a Certified Pesticide Applicators Permit as part of the course requirements.

AGRI 219 Crop Machinery and Equipment

3 Credits

Prerequisites: None. Principles of choosing, operating, and maintaining machines and equipment used in production of field crops. This course incorporates mandatory OSHA Safety Awareness certification program in which successful completion results in students earning their OSHA Safety Awareness certification.

AGRI 220 Applied Agronomy

3 Credits

Prerequisites: None. Principles of agronomy related to nutrient management, soil management, water management, integrated pest management and cropping systems. Course prepares students to take the certified crop advisor exam.

AGRI 222 Agriculture Applications of Geographic Information Systems **3 Credits**

Prerequisites: None. Fundamental processes of geographic information systems (GIS) with application to agriculture. File formats, database management, spatial analysis, and manipulation of data. Georeferenced data from mapping and yield monitoring.

AGRI 223 Plant Pest ID and Control **3 Credits**

Prerequisites: None. Identification and control of weeds, insects, and diseases. Control methods include prevention, biological control, resistant varieties, and pesticides. Pesticide terminology, formulations, calibration, environmental concerns, safe handling, and laws and regulations concerning pesticides.

AGRI 231 Equine Reproduction **3 Credits**

Prerequisites: None. Students will learn firsthand what it takes to breed equines. This hands-on, practical approach is a unique opportunity for students looking for a career in the equine industry.

AGRI 232 Equine Management **3 Credits**

Prerequisites: None. Compare and contrast draft horses to light horses. Stable and pasture management, conformation, and safety.

AGRI 233 Poultry Production **3 Credits**

Prerequisites: None. This course is designed to introduce students to the principles of poultry production and management. Topics include anatomy, physiology, reproduction, incubation, embryonic development, breeding and genetics, nutrition and feeding, disease control, animal welfare, housing and environmental control, flock management, poultry and egg products, harvest/processing and the structure of the poultry industry.

AGRI 234 Exotic Animal Care **3 Credits**

Prerequisites: None. Provides an overview of the principles of exotic animal, agriculture impacts and livestock alternatives. Detailed importance in ensuring safe exotic animal care. Emphasis is placed on the principles of nutrition, preservation, conservation, laws/regulations, and careers in the agricultural exotic animal science industry. Field trips, experience guest speakers, volunteering, and problem solving are used to enhance student learning in this course.

AGRI 235 Livestock Behavior and Handling **2 Credits**

Prerequisites: None. This course studies the principles of the behavior and proper handling techniques of livestock animals. Examines proper handling, transportation, and anticipation of typical behaviors involved with livestock species. Enables students to have hands on, safe, practical experience learning the appropriate techniques for handling and transportation.

AGRI 236 Companion Animal Management **3 Credits**

Prerequisites: None. The objective of this course is to familiarize students with the companion animal industry. This will include types of companion animals, their physiology in health and disease, nutrition, care, and jobs working with companion animals including biomedical research.

AGRI 237 Horticulture & Animal Therapy **3 Credits**

Prerequisites: None. The objective of this course is to professionally direct the use of plants, garden, animal, and natural activities to achieve measureable physical and mental health outcomes of individuals. Focus areas may include practice in hospitals, rehabilitation and vocational facilities, skilled care agencies and senior centers, community gardens, botanical gardens, prisons, and other settings.

AGRI 261 Herbaceous Landscape Plants **3 Credits**

Prerequisites: None. The identification, selection, installation and maintenance of annual and perennial grasses and flowering plants. Emphasis is placed on selection of appropriate plant material for Midwestern landscapes.

AGRI 262 Woody Landscape Plants **3 Credits**

Prerequisites: None. The identification, selection, installation and maintenance of trees and shrubs in the landscape. Emphasis is placed on the cultural requirements of native and exotic ornamentals for Midwestern landscapes.

AGRI 271 Agriculture Structures **3 Credits**

Prerequisites: None. Construction process and construction methods of typical agriculture buildings. Course will include extensive hands-on laboratory involving the construction of an agriculture structure.

AGRI 280 Co-op/Internship **1–3 Credits**

Prerequisites: Program Advisor Approval. Provides students with the opportunity to work for an organization that is specifically related to their career objectives. Provides on-the-job experience while earning credit.

AGRI 290 Agriculture Seminar

1 Credit

Prerequisites: Completion of 40 credit hours towards an agriculture degree and Program Advisor Approval. Seminar designed to assist students dealing with the management and day-to-day decision making involved in the operation of an agricultural/agri-business firm.

ALTF 103 Principles of Alternative/Renewable Energies

3 Credits

Prerequisites: None. Covers basic principles and history of alternative energy sources. Industry and government status of geothermal, wind, solar, biomass, fuel cells and other energy sources will be highlighted, as well as a thorough discussion of Smart Grid Technology. Alternative and traditional energies will be defined and compared in terms of today's use. This course will provide first responder for hybrid and electric vehicle safety training and will discuss evolving energy careers.

ALTF 104 Liquid Propane Gas I (LPG)

3 Credits

Prerequisites: AUTI 100. This course is the first in a series of two that focus on the use of liquefied propane gas as an alternative fuel, and how it is used in material handling, automobiles and light duty trucks applications. Additionally, the theory of operation, installation, diagnosis and current safety regulations of the use of LPG will be emphasized.

ALTF 106 Compressed Natural Gas I

3 Credits

Prerequisites: AUTI 100. This course introduces students to the role, function and application of compressed natural gas (CNG) as an alternative fuel for today's internal combustion engine. The course is the first of two courses that assists in preparing students to take the ASE F1 exam.

ALTF 114 Compressed Natural Gas II

3 Credits

Prerequisites: ALTF 106. Applies skills gained from ALTF 106 and expands them in theory and application. The course focuses on the advanced maintenance, diagnosis and repair, as well as conversion and installation of the compressed natural gas fuel system.

ALTF 211 Alternative Fuels Installation and Application

3 Credits

Prerequisites: ALTF 103, 104, and 106. Focuses on shop safety, gaseous fuel handling, federal fuel standards, and industry standards related to the conversion and installation processes of standards of alternative fuel system components/systems to current vehicles.

AMSL 101 American Sign Language I

4 Credits

Prerequisites: None. American Sign Language I is an introduction to ASL as it is used within the deaf culture. Students will learn the basic grammatical structure of the language and basic communication skills including finger spelling, facial expressions and non-manual behaviors. Students will gain an understanding of the history and development of deaf culture, its values and literature. Students will be able to demonstrate the ability to communicate sign language at a basic, introductory level. Class activities will include the use of storytelling as a way for students to practice and read ASL.

AMSL 102 American Sign Language II

4 Credits

Prerequisites: AMSL101. American Sign Language II is designed to provide a continuation of the introductory course. Students will increase their knowledge of the deaf community, culture, and deaf education in a hearing world. The deaf perspective on traditional employment of deaf people in a hearing society will be explored. In language development, complex grammar functions, expanded vocabulary, and skill development are incorporated into the use of sign production. Students will be exposed to the controversial cochlear implant and how it is affecting the deaf and their culture.

AMSL 202 American Sign Language IV

3 Credits

Prerequisites: AMSL 201. Students will continue to increase their knowledge of complex grammar, idioms, facial expressions, cross cultural communication and the history of the language and its usage. Expressive and receptive skills will be advanced as fluency increases. Students will also continue to develop a knowledge base of appropriate behaviors and cues in various settings. Students will develop a solid foundation for advanced study.

ANTH 103 Human Origins and Prehistory

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better ENGL 093 and ENGL 083 or ENGL 095. Human Origins is the scientific study of human biological and cultural evolution from early pre-Pleistocene hominids through the development of urbanized state societies. This course is a focused and critical examination of the paleo-anthropological record. Acquaints the student with the skills and knowledge to create a critical appraisal of our human heritage.

ANTH 154 Cultural Anthropology

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. The scientific study of human culture. Variations in patterns of human behavior are holistically examined in their relationship to such factors as biological evolution, socialization, kinship, economy, religion, education, personality, art, music, dance, and cultural change.

ANTH 254 Introduction to Archaeology

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. The scientific study of the material artifacts of human cultural remains. Provides insight into the earliest patterns of human behavior and its subsequent evolution into more complex forms. Acquaints the student with archaeological methods and with major findings of the archaeological record from selected culture areas.

APHY 067 Introduction to Anatomy and Physiology

3 Credits

Prerequisites: None. Introduces basic concepts and terminology used in Anatomy and Physiology. Prepares entering students who took no high school life science or took it several years ago for APHY 101 and APHY 102 (or APHY 203 and 204). Provides a general introduction to chemistry, cells, tissues, body systems, and basic physiological processes.

APHY 101 Anatomy and Physiology I

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. Corequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or MATH 080. Develops a comprehensive understanding of the close inter-relationship between anatomy and physiology as seen in the human organism. Introduces students to the cell, which is the basic structural and functional unit of all organisms, and covers tissues, integument, skeleton, muscular and nervous systems as an integrated unit.

APHY 102 Anatomy and Physiology II

3 Credits

Prerequisites: APHY 101 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or MATH 080. Continues the study of the inter-relationships of the systems of the human body. Introduces students to the study of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems.

APHY 201 Advanced Human Physiology

4 Credits

Prerequisites: Successful completion of APHY 101 and APHY 102, or equivalent. Provides a study of human physiology for students entering health-oriented fields. Emphasizes the study of the function of cells, the nervous, muscular, circulatory, respiratory, urinary, digestive and endocrine systems, and their homeostatic mechanisms and system interaction. Focuses laboratory exercises on clinically relevant measurement of human function. Includes lab.

APHY 203 Human Anatomy and Physiology I

5 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. Corequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or MATH 080. Provides a comprehensive study of the interrelationship between anatomy and physiology from chemical to cellular to organ interactions. Provides an in-depth study of each system of the body from a viewpoint of structure as well as function.

APHY 204 Human Anatomy and Physiology II

5 Credits

Prerequisites: APHY 203 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 015 or MATH 023. Provides the remaining comprehensive study of the inter-relationship between anatomy and physiology from chemical to cellular to organ interactions. Provides an in-depth study of each system of the body from a viewpoint of structure as well as function: endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. Includes lab.

ARAB 101 Elementary Arabic I

4 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095. This course is the first semester introduction to Modern Standard Arabic (and one of two dialects, Egyptian or Levantine). Focuses on developing students' capacity to use the language and to appreciate Arabic-speaking cultures. Emphasis is placed on skills of listening, speaking, reading, writing, and grammar acquisition.

ARAB 102 Elementary Arabic II

3 Credits

Prerequisites: Arab 101 or demonstrated competency in Arabic through appropriate assessment; demonstrated competency in reading and writing through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095. This course is the second semester introduction to Modern Standard Arabic (and one of two dialects, Egyptian or Levantine). By the end of this semester Arabic students will have reached the Novice-High proficiency level in listening, speaking, reading, and writing skills.

ARTH 101 Survey of Art and Culture I

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in (ENGL 093 and ENGL 083) or ENGL 095. Survey of Art and Culture I examines painting, sculpture, and architectural styles from ancient cultures to the proto-Renaissance era. An emphasis is placed on understanding the historical and global contexts of art movements and analyzing the works of individual artists.

ARTH 102 Survey of Art and Culture II

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. A critical thinking course that delves into the thought processes and manual skills needed in design and its application in the realm of two-dimensional fine arts. Beginning to intermediate design and color theory will be addressed through the manipulation of imagery in two-dimensional media. Critical thinking, problem-solving and manual techniques will be emphasized equally.

ARTH 105 History of Design

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in (ENGL 093 and ENGL 083) or ENGL 095. This course surveys the history of design from the earliest stages of the printing press and other production tools including photographic processes to contemporary and evolving applications. A wide-range of periods specifically within the history of graphic and photographic design will be explored as well as the influences of craft, industry, technology, philosophy, religion and other cultural forces associated with style. Historical contexts will also be examined as well the connection between "design work" and the "fine arts" of the same period.

ARTH 110 Art Appreciation

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in (ENGL 093 and ENGL 083) or ENGL 095. An introductory course in art which explores the creative processes of humankind, its usage of specific traditional and contemporary media for communication and the study of periods and styles in art as they relate to the human condition. The course will explore the nature of art, the evaluation of art, and the processes and materials of art. The students will examine the formal elements of design and look at a wide variety of both two and three-dimensional artworks and will learn about the processes and tools involved in their creation.

ARTS 100 Life and Object Drawing I

TransferIN 3 Credits

Prerequisites: None. Corequisites: Demonstrated competency through appropriate assessment or ENGL 093 and ENGL 083 or ENGL 095. This introductory course will result in the advancement of basic drawing skills utilizing the human figure, natural and manufactured objects. Basic techniques and creative processes will be explored through expressive use and exploration of a variety of materials and techniques. Emphasis will be placed on developing basic quality draftsmanship with a focus on proportion and structure.

ARTS 101 Life and Object Drawing II

3 Credits

Prerequisites: ARTS 100. Rendering abilities will continue to advance with drawing techniques utilizing the human figure, natural and manufactured objects, specifically from life (not photographs). More advanced techniques and creative processes will be explored through expressive use and exploration of a variety of materials and techniques. Emphasis will be placed on developing a higher level of quality draftsmanship with a focus on proportion and structure.

ARTS 102 Color and Design Theory I

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. A critical thinking course that delves into the thought processes and manual skills needed in design and its application in the realm of two-dimensional fine arts. Intermediate to advanced design and color theory will be addressed through the manipulation of imagery in two-dimensional media. Critical thinking, problem-solving and manual techniques will be emphasized equally.

ARTS 103 Three-Dimensional Design

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. An introductory course into the thought processes and manual skills needed in three-dimensional design. Basic techniques and creative processes will be explored through expressive use and exploration of a variety of materials and techniques. Critical thinking, problem-solving and manual techniques will be emphasized equally.

ARTS 200 Intermediate Drawing I

3 Credits

Prerequisites: ARTS 101. This intermediate course will continue the advancement of drawing skills utilizing the human figure, natural and manufactured objects. There will be a thorough investigation of nature and the human figure through drawing. Techniques and creative processes will be explored through expressive use and exploration of a variety of materials and techniques. Emphasis will be placed on quality draftsmanship with a focus on structure, line, gesture, and movement.

ARTS 201 Intermediate Drawing II

3 Credits

Prerequisites: ARTS 200. This intermediate course will continue the advancement of drawing skills utilizing the human figure, natural and manufactured objects. There will be a thorough investigation of nature and the human figure through drawing. Techniques and creative processes will be explored through expressive use and exploration of a variety of materials and techniques. Emphasis will be placed on quality draftsmanship with a focus on structure, line, gesture, and movement.

ARTS 202 Color and Design Theory II

3 Credits

Prerequisites: ARTS 102. A critical thinking course that delves into the thought processes and manual skills needed in design and its application in the realm of two-dimensional fine arts. Intermediate to advanced design and color theory will be addressed through the manipulation of imagery in two-dimensional media. Critical thinking, problem-solving and manual techniques will be emphasized equally.

ARTS 204 Exploration of Women in Art **3 Credits**

Prerequisites: ARTH 101 or ARTH 102 or ARTS 104. This course will survey painting, sculpture, installations, performance art, design and architecture created by women from medieval cultures to the present. Contemporary approaches to women's art will also be explored and emphasized.

ARTS 205 Fundamentals of Fabric Design **3 Credits**

Prerequisites: ARTS 101, ARTS 102. A critical thinking and studio course that explores the various dyeing, stitching and surface design techniques used in fabric design and its application in the realm of two-dimensional fine arts. Critical thinking, problem-solving and manual techniques will be emphasized equally.

ARTS 206 Materials and Processes **3 Credits**

Prerequisites: ARTS 101, ARTS 102 and ARTS 103. This intermediate class exposes students to broad subject matter through directed material studies. Advanced design and creative processes will be explored by utilizing four or five material specific exercises to emphasize additive and subtractive processes at an advanced level.

ARTS 211 Sculpture I **3 Credits**

Prerequisites: ARTS 103. This is a basic course in the consideration of three-dimensional form in sculptural concept. Students will be exposed to various related materials, techniques, and processes. Emphasis will be on composition, positive and negative space and craft of material technique.

ARTS 212 Sculpture II **3 Credits**

Prerequisites: ARTS 211. This is a continuation of Sculpture I resulting in intermediate use of three-dimensional design skills, applications and materials. Emphasis will be on intermediate techniques and advancing compositional skill.

ARTS 224 Silkscreen Printmaking **3 Credits**

Prerequisites: ARTS 100 and ARTS 102. Beginning course in printmaking, which introduces students to the traditional techniques of serigraphy or silkscreen printmaking. Students are instructed in basic printing processes and in use of the screens. Emphasis will be on composition, craft, technical processes and translation of multiple types of content to print.

ARTS 226 The Art of The Book **3 Credits**

Prerequisites: ARTS 102 and ARTS 103. Introduces the techniques, processes and aesthetic concerns of book arts as a studio art medium. Students will complete a number of original works using folding, cutting, and traditional fabrication as well as adhesive and non-adhesive books with sewn spines. Technique, concept and aesthetics will be discussed and used as a foundation for composition, execution and formal analysis in critiques.

ARTS 228 Foundations of Printmaking **3 Credits**

Prerequisites: ARTS 100, and ARTS 102. Beginning course in printmaking, which introduces students to the traditional techniques of intaglio, collagraph, monotype and relief printmaking. Students are instructed in basic printing processes and in use of the presses. Emphasis will be on composition, craft, technical processes and translation of multiple types of content to print.

ARTS 231 Painting I **3 Credits**

Prerequisites: ARTS 100 or VISC 111 and ARTS 102 or VISC 101. An introductory course aimed at the development of painting skills, techniques, and aesthetic sensibilities. Explores and experiments with basic painting mediums, which may include: watercolors, acrylics, and oils in varying degrees. Builds visual thinking skills and methods for channeling creative energies that enable a lifetime of personal artistic expression.

ARTS 232 Painting II **3 Credits**

Prerequisites: ARTS 231. An extension of the skills and concepts introduced in Painting I. Emphasis is on individual experimentation and the development of more advanced critical and technical skills in the discipline. Course continues to build visual thinking skills and methods for channeling creative energies that further enable a lifetime of personal artistic expression.

ARTS 241 Ceramics I **3 Credits**

Prerequisites: None. This course is designed to introduce students to the various techniques, processes and aesthetic concerns of ceramics as a studio art medium. Focus will be on using hand-building techniques to create original artworks as well as an introduction to glazing and firing practices. Technique, concept and aesthetics will be discussed and used as a foundation for composition, execution and formal analysis in critiques.

ARTS 242 Ceramics II **3 Credits**

Prerequisites: None. ARTS 242 Ceramics II is a continuation of ART 241 Ceramics I. This class will emphasize throwing utilitarian (functional) vessels and ware. The potter's wheel will be the primary tool of this class. Students will be introduced to a variety of throwing techniques, proper glazing and firing practices as well as aesthetic concerns of ceramics as a studio art medium. Students will create their own original work; in addition, students will learn practical studio experience such as proper safety procedures, studio hygiene, and minor equipment maintenance.

ARTS 250 Fine Arts Portfolio

3 Credits

Prerequisites: Permission of Program Chair. This is a course that prepares the student for transfer to another University environment and to begin exhibiting and working professionally. Course covers artist resume development, artist statement, artwork presentation: digital and in-hand, along with some of the business aspects of being an artist. A polished presentation with portfolio is the final for this course. Requires students to complete two sections of a college-approved standardized assessment of proficiency in math, writing, scientific inquiry, and/or critical thinking.

ARTS 260 Introduction to Theatre

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Explores theatre as a collaborative art form, investigating the dynamics and creativity of theatre production through plays, the various forms of the theatrical space and its cultural context, with particular attention to the roles and interaction of the audience, playwrights, directors, actors, designers, producers, and critics.

ARTS 261 Introduction to Theatrical Production

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course is designed as an introduction to production and creates a solid basis for further study in all disciplines of theatre. The course is divided into two components, the first of which is stagecraft; covering the scenic studio and its operation, the building of scenery, its techniques, skills, and terminology. This section also acquaints students with the basic skills of drafting. The course is an introduction to theatrical design with an emphasis on scenic design and additional introductions into the disciplines of costume, lighting, and sound design.

ARTS 262 Acting

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course will introduce the creation of fundamentals of insights into the craft of acting and provide an introduction to basic behavioral and imaginative skills. It will also provide development of a practical method for creating simple belief and playing an action and provide a rehearsal approach of developing a monologue.

ARTS 266 Core of Dance Technique

3 Credits

Prerequisites: None. Introduces concert dance techniques, as well as stretching and strengthening exercises to prepare for those techniques. Study and practice of dance technique and theory will be emphasized. Understanding, appreciation and critical analysis of concert dance will be cultivated through participation in and viewing of live performances and/or historically relevant videos. The course will require attendance and written critiques of live dance performances to offer firsthand experience in the art of concert dance.

ARTS 267 Beginning Modern Dance Technique

3 Credits

Prerequisites: None. Focuses on the development of beginning proficiency in the execution and practice of fundamental exercises and movements involved in modern dance. The course approaches modern dance as an art form, an entertainment medium and as a vehicle for self-expression. Active participation in the choreographic process and a performing opportunity will be provided. The course requires attendance at live dance performances to offer firsthand experience in the art of concert dance.

ARTS 268 Introduction to Jazz Dance Technique

3 Credits

Prerequisites: None. Introduces students to the jazz dance style of movement as it integrates with sound biomechanical principles. The development of jazz dance in relation to jazz music will be examined through historical study. The course will approach jazz dance as an art form, an entertainment medium and as a vehicle for self-expression. An understanding, appreciation and critical analysis of jazz dance will be cultivated through participation in and viewing of live performances and/or historically relevant videos.

ASTR 101 Solar System Astronomy

Transfer/IN 3 Credits

Prerequisites: MATH 023 or MATH 080 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Survey of the history of astronomy, astronomical cycles and phenomena, astronomical instruments, formation and evolution of the planets and their satellites, comparative planetology, asteroids, comets, meteors, the sun, and the origin of the solar system. Includes lab.

ASTR 102 Stellar and Galactic Astronomy

3 Credits

Prerequisites: MATH 023 or MATH 080 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Survey of the types and properties of stars, birth and life cycle of stars, including white dwarfs, neutron stars, and black holes, structure and dynamics of galaxies, galactic evolution, cosmology, birth and fate of the universe, and life in the universe. Includes lab.

AUBR 100 Introduction to Collision Service

3 Credits

Prerequisite: None. This course gives students an overview of the operating and general maintenance systems of the modern automobile. Students will be introduced to the safety and operation of equipment and tools used in the automotive collision industry. Students will study the basics of collision repair in the automotive industry. In addition, this course will prepare students to take a nationally recognized certification exam.

- AUBR 101 Body Repair I** **3 Credits**
Prerequisites: None. Corequisite: AUBR 125. Examines characteristics of body metals and includes installation of moldings, ornaments, and fasteners with emphasis on sheet metal analysis and safety.
- AUBR 102 Auto Body Chassis Service** **3 Credits**
Prerequisites: None. This course covers the service of disc brake repair, drum brake repair, brake hydraulic fundamentals, steering and suspension component identification diagnosis and replacement, 2 and 4 wheel alignment, cooling system fundamentals, HVAC fundamentals.
- AUBR 103 Automotive Paint Fundamentals** **3 Credits**
Prerequisites: None. Introduces auto paint considerations with emphasis on the handling of materials and equipment in modern automotive technologies.
- AUBR 104 Collision Damage Analysis and Repair** **3 Credits**
Prerequisites: None. Provides instruction in analyzing extensive body damage and determining the tools and procedures needed to replace panels.
- AUBR 105 Conventional Frame Diagnosis and Correction** **3 Credits**
Prerequisites: AUBR 125 or Program Advisor Approval. Covers the use of tools, frame machines and equipment for frame and chassis repair. Includes study of terms pertaining to front suspension and rear axle. Describes uses of frame gauges and other measuring devices.
- AUBR 115 Auto Body Circuits** **3 Credits**
Prerequisites: None. Includes automotive components and their respective circuits, troubleshooting techniques, supplemental restraint systems (SRS), scan tool usage, and module initialization and relearn procedures.
- AUBR 125 Automotive Body Welding** **3 Credits**
Prerequisites: None. Provides basic skills and fundamental knowledge in oxy-fuel welding, cutting, brazing and plasma cutting, gas metal arc welding, squeeze type resistance welding, exterior panel welding and I-CAR welding test preparation. This course is designed for auto service and body technicians. Emphasizes safe practices in ox-fuel and specific welding processes in the automotive body repair field. In addition, this course will prepare students to take a nationally recognized certification exam.
- AUBR 206 Body Repair II** **3 Credits**
Prerequisites: AUBR 101. Introduces fundamentals of using hand and power tools in the repair of minor collision damage, with emphasis on safety.
- AUBR 207 Automotive Painting Technology** **3 Credits**
Prerequisites: AUBR 103 and Program Advisor Approval. Provides instruction on the total refinishing of an automobile with emphasis on advanced and specialty painting techniques.
- AUBR 208 Unibody Structural Analysis and Repair** **3 Credits**
Prerequisites: None. Covers unibody repair, identification and analysis of damage, measuring and fixing systems, straightening systems and techniques, mechanical component service and knowledge of suspension and steering systems on front-wheel-drive unibody vehicles.
- AUBR 209 Collision Damage Appraising** **3 Credits**
Prerequisites: None. Provides instruction in analyzing extensive body damage and determining the tools and procedures needed to replace panels.
- AUBR 217 Waterborne Refinish Technology** **3 Credits**
Prerequisites: AUBR 103. Provides instruction on the total refinishing of an automobile with an emphasis on waterborne refinish techniques, materials, and applications.
- AUBR 220 Fiberglass Plastic Repair** **3 Credits**
Prerequisites: None. Introduces types of fiberglass and plastic materials used in auto body repair. Covers both interior and exterior applications.
- AUBR 227 Custom Paint Applications** **3 Credits**
Prerequisite: AUBR 103. Provides instruction and interaction on application of custom finishes to metal and composite materials.
- AUBR 237 Advanced Refinish Techniques and Technology** **3 Credits**
Prerequisites: AUBR 103, AUBR 207 or AUBR 217. Provides instruction on the total refinishing of an automobile with an emphasis on advanced refinish techniques, materials, and applications.
- AUTC 100 Introduction to Automotive** **3 Credits**
Prerequisites: None. This is an introductory course which gives students an overview of the operating systems of the modern automobile. Students will be introduced to the safety and operation of tools and equipment used in the automotive industry.

AUTI 100 Basic Automotive Service

3 Credits

Prerequisites: None. This course gives students an overview of the operating and general maintenance systems of the modern automobile. Students will be introduced to the safety and operation of equipment and tools used in the automotive industry. Students will study the maintenance and light repair of automotive systems. In addition, this course will prepare students to take a nationally recognized certification exam.

AUTI 111 Electrical Systems I

3 Credits

Prerequisites/Corequisites: AUTI 100 or AUBR 100, or TRCK 100 or AUTC 100, and AUTC 107. This is the first of two courses that gives students an overview of the electrical operating systems of the modern automobile. Students will be introduced to the safety and operation of equipment and tools used in the electrical diagnosis and repair in the automotive electrical industry. Students will study the fundamentals of electricity and automotive electronics. In addition, this course will prepare students to take a nationally recognized certification exam.

AUTI 112 Electrical Systems II

3 Credits

Prerequisites: AUTI 111. This course is the second in a series of two courses that gives students an in-depth study of vehicle electrical systems. Students will study the fundamentals of electricity and automotive electronics in various automotive systems.

AUTI 121 Brake Systems

3 Credits

Prerequisites/Corequisites: AUTI 111, or AUTC 113. This is the first of two courses that teaches theory, service and repair of automotive braking systems. This course provides an overview of various mechanical brake systems used on today's automobiles. This course will emphasize professional diagnosis and repair methods for brake systems.

AUTI 122 Steering and Suspension Systems

3 Credits

Prerequisites/Corequisites: AUTI 111, or AUTC 113. This is the first of two courses that teaches theory, service and repair of automotive steering and suspension systems. This course provides an overview of various mechanical, power, and electrical steering and suspension systems used on today's automobiles. This course will emphasize professional diagnosis and repair methods for steering and suspension systems.

AUTI 131 Engine Performance Systems I

3 Credits

Prerequisites/Corequisites: AUTI 111, or AUTC 113. This is the first of three courses that takes an in-depth look at engine performance, including concepts in the diagnosis and repair of ignition, fuel, emission and related computer networks. This course presents engine theory and operation and studies the various engine designs utilized today.

AUTI 132 Engine Performance Systems II

3 Credits

Prerequisites/Corequisites: AUTI 131 or AUTC 109, and AUTI 112 or AUTC 123. This is the second in a series of three courses that takes an in-depth look at engine performance, including advanced concepts in the diagnosis and repair of ignition, fuel, emission and related computer networks. This course presents engine theory and operation and studies the various engine designs utilized today. Hybrid/Alternative fuel technology will also be introduced.

AUTI 141 Engine Fundamentals and Repair

3 Credits

Prerequisites/Corequisites: AUTI 100. This course focuses on repair techniques for today's engines. The course will utilize precision measuring tools, specialized tools and equipment, and emphasize following prescribed procedures needed to properly repair today's modern engine. This course also presents engine theory and operation and studies the various engine designs utilized today. In addition, this course will prepare students to take a nationally recognized certification exam.

AUTI 142 Climate Control Systems

3 Credits

Prerequisites/Corequisites: AUTI 112 or AUTC 123 or TRCK 224. This course covers air conditioning and heating systems used on modern vehicles including both manual and automatic systems. EPA regulations as well as recycle processes will be practiced.

AUTI 145 Driveline Service

3 Credits

Prerequisites/Co-Requisites: AUTI 100 or AUTC 100. This introductory course will study driveline theory and in-car service procedures. Theory and overhaul procedures related to the driveshaft and axle assemblies for front and rear wheel drive vehicles are included as well.

AUTI 149 Introduction to Motor Sports

3 Credits

Prerequisites: None. This course provides an overview of the various racing/motor sports venues in the U.S. Students will gain an understanding of various racing venues and their operations. Emphasis will be placed on professional level racing, although sportsman and semi-professional venues will also be discussed. Students will learn about the various careers available throughout the motor sports industry.

AUTI 154 Automotive Special Topics

3 Credits

Prerequisites: Advisor Approval. This course is designed to allow students to gain additional experience in automotive related activities. Such activities can include but are not limited to; interaction with hybrid or electrical vehicles, advanced drive ability diagnosis, engine or transmission repair activities, activities that strengthen the different ASE categories or help prepare students for ASE exams.

AUTI 160 Diesel Engine Theory and Service

3 Credits

Prerequisites: None. Operation of the diesel engine and the differences between a diesel and gas engine. Also includes instruction on shop equipment, fuels, oils, lubrication, and cooling systems.

AUTI 210 Electric and Hybrid Vehicle Technologies

3 Credits

Prerequisites: AUTI 112. This course provides an overview of the fundamentals of operation, diagnosis and repairing of electric and gas-electric hybrid vehicles. Topics to be covered will include batteries, fuel cells, electric motors, controllers, invertors and auxiliary accessories utilized in the Electric Vehicle and Hybrid Electric Vehicle platforms.

AUTI 221 Vehicle Diagnosis and Service

3 Credits

Prerequisites: AUTI 122, AUTI 121, AUTI 112, AUTI 251, and AUTI 142. This applied service course is designed to enhance a student's hands-on skills to diagnose and repair vehicle concerns across a variety of areas. Emphasis will be placed on Braking Systems, Steering and Suspension Systems, Climate Control Systems, and Automatic Transmissions.

AUTI 224 Advanced Chassis Systems

3 Credits

Prerequisites: AUTI 121 or AUTC 122, and AUTI 122 or AUTC 101, and AUTI 112 or AUTC 123. This is the second of two courses that teaches theory, service and repair of advanced automotive braking systems and steering and suspension systems. This course provides an in-depth study of the various mechanical and electronic steering and suspension systems used on today's automobiles. This course will emphasize professional methods of diagnosis and repair for steering-related components and advanced alignment practices.

AUTI 229 Driveability Diagnosis

3 Credits

Prerequisites: AUTI 234. This advanced course is designed to develop a student's ability to diagnose and repair complex driveability concerns. Emphasis will be placed on learning and following systematic diagnostic procedures. Students will utilize the advanced capabilities of the diagnostic equipment provided.

AUTI 231 Racing Suspension Systems

3 Credits

Prerequisites: AUTI 122. This course covers all forms of suspension systems used on automotive race vehicles. Students should have a basic knowledge of alignment angles and procedures and be familiar with suspension components. The effects of suspension geometry and chassis setup will be stressed. The course will cover many types of racing suspension systems including drag racing, sprint car, modified and late model race cars.

AUTI 234 Engine Performance Systems III

3 Credits

Prerequisites: AUTI 132. This is the last course in the engine performance series. This course covers advanced concepts in the diagnosis and repair of ignition, fuel, emission, and related computer networks. Federal and state emission requirements will be covered with a focus on 5-gas exhaust analysis and scope utilization. Hybrid/Alternative fuel technology will also be introduced.

AUTI 243 Electrical and Electronics III

3 Credits

Prerequisites: AUTI 112. This last in a series of three courses presents advanced theory and diagnosis of automotive electrical/electronics systems. It examines all major vehicle computer systems with an emphasis on network diagnosis, testing, and repair. This course uses lab scopes, scan tools, and graphing multi-meters.

AUTI 250 Manual Transmissions

3 Credits

Prerequisite: AUTI 112, or AUTC 123. This course covers theory, diagnosis and repair procedures related to manual transmission/transaxles, clutches, transfer cases and differential assemblies.

AUTI 251 Automatic Transmissions I

3 Credits

Prerequisites: AUTI 111 or AUTC 113. This is the first of two courses covering automatic transmissions and transaxles. This course will focus on the mechanical and hydraulic systems including theory of operation, unit teardown, component diagnosis and testing, and repair/ rebuild procedures. Transmission Electronic controls will be introduced.

AUTI 252 Automatic Transmissions II

3 Credits

Prerequisites/Corequisites: AUTI 251 or AUTC 135, and AUTI 112 or AUTC 123, and AUTI 131 or AUTC 109. This is the second course in automatic transmission and transaxles and covers the function and operation of electronically controlled transmissions. Removal, installation and fluid service will be covered. Emphasis is placed on proper diagnosis, testing, and repair procedures utilizing scan tools, scopes and other required diagnostic tools.

AUTI 253 Service Organization and Parts

3 Credits

Prerequisites: Program Advisor Approval. Facility and personnel requirements for efficiently run parts and service departments. Emphasis is on principles, practices and procedures necessary to effectively operate the departments. Includes: manufacturer catalogs and component numbering systems, methods of scheduling time and techniques for obtaining maximum work efficiency from technicians and specialists.

AUTI 254 High Performance Engines/Systems I

3 Credits

Prerequisites: None. This course covers the fundamentals, construction, components and design of high performance engines/systems for various racing venues. The course will also cover related systems; cooling, lubrication, suspension and braking. Students will study the theory, design and requirements of high performance engines/systems and then design their own modified engine which they will run and evaluate using the computer dyno simulation program. Emphasis in this course is placed on bolt on performance modifications/power adders.

AUTI 255 High Performance Engines/Systems II

3 Credits

Prerequisites: AUTI 254. This course covers the assembly/blueprinting of a competition engine. The course will focus on the basics of block and component preparation and clearancing, cylinder head porting, intake port matching and component balancing. Students will measure all critical clearances during assembly including but not limited to: deck heights, piston to valve clearances, chamber volumes, bearing clearances, piston to wall clearances, rod side clearances.

AUTI 258 Motor Sports Kit Car Building

3 Credits

Prerequisites: None. This course covers the design and building of the cobra kit car. Emphasis will be placed on proper assembly/fabrication/improvement of the various subassemblies required to build this vehicle. Tire and wheel combinations, exhaust systems and other accessory options will also be discussed. Students will learn to cut, weld and form metal as needed for use in the kit car assembly. Students will demonstrate knowledge through project/task completion.

AUTI 260 Advanced Hybrid Vehicle and Electric Technologies

3 Credits

Prerequisites: AUTI 210. This course presents advanced theory, diagnosis and repair of Battery Electric Vehicles and Hybrid Electric Vehicles using manufacturer specific diagnostic tools and equipment. This course will also include trouble-shooting of Plug-in Hybrid Electric Vehicle technologies as well as installation of a Plug-in hybrid Electric Vehicle conversion kit.

AUTI 261 Dynamometer Testing and Analysis

3 Credits

Prerequisites: Program Advisor Approval. This advanced course covers chassis dynamometer operation and analysis of the software generated data. Students should have a background in high performance vehicles. The effects of modifications to vehicles will be stressed.

AUTI 262 Motor Sports Fabrication I

3 Credits

Prerequisites: None. This course introduces the fundamentals of motor sports fabrication and the required tools and equipment. Students will learn to cut, weld and form metal for use in race car fabrication. Sheet metals brakes, bead rollers, tube benders, tubing notchers and a variety of welding processes will be covered. Students will demonstrate knowledge through project/task completion.

AUTI 263 Motor Sports Fabrication II

3 Credits

Prerequisites: AUTI 262 and WELD 208. This course builds on the fundamentals learned in AUTI 262 Motor Sports Fabrication I. Students will learn basic machining process using mills, metal lathes, and CNC processes. English wheels, planishing hammers, sheet metal brakes, bead rollers, tube benders, tubing notchers and a variety of welding processes will be utilized. Students will demonstrate knowledge through project/task completion.

AUTI 264 Motorsports Machining

3 Credits

Prerequisites: None. This entry level course will cover machine shop safety, print reading and machining processes used in the fabrication and customization of racing parts. Machines used in this course are: manual with numerical control, vertical milling machines, engine lathes, pedestal grinders, and surface grinders.

AUTI 267 Motor Sports Project

3 Credits

Prerequisites: AUTI 262, AUTI 263, and AUTI 254. This capstone course is designed to provide students with an opportunity to apply their knowledge and skills to an actual motorsports project in a production type environment. Projects will vary between work on actual race cars and work on supporting tools and equipment for the motorsports industry.

AUTI 279 Automotive Capstone

2 Credits

Prerequisites: Program Advisor Approval (must be taken in last 9 credit hours). This course covers advanced engine performance and electrical topics. This is a capstone course which prepares the student for entry into the field of Automotive. With the help of Career Services this course reviews the procedures for conducting a job search, resume and cover letter writing, interviewing, and follow-up communications. This course provides for taking program outcomes assessments.

AUTI 280 Co-Op or Internship

3 Credits

Prerequisites: Program Advisor Approval. This course will provide qualifying students an opportunity to work at a job site that is specifically related to their career objective. This class will provide on-the-job experience while earning credit toward an Associate degree.

AUTI 299 Automotive Special Topics

3 Credits

Corequisites: Program Advisor Approval. This course is designed to allow students to gain additional experience in automotive related activities. Such activities can include but are not limited to; interaction with hybrid or electrical vehicles, advanced drive ability diagnosis, engine or transmission repair activities, activities that strengthen the different ASE categories or help prepare the students for ASE exams.

AVIM 101 Aerospace Manufacturing Core

3 Credits

Prerequisites: None. This is an introductory course designed to provide the student with an overview of aerospace manufacturing methods and procedures. The course will be delivered in an online format covering 9 subjects in the following areas: Aircraft Familiarization, Sealing & Safety, Manufacturing Paperwork, Engineering Processes, Precision Instruments, Hand Tools, Blueprint Reading, Bonding & Grounding and Composite Materials.

AVIM 102 Power Island and Basic Drilling/Riveting

3 Credits

Prerequisites: AVIM 101. This course is an introduction and demonstration of Power Island equipment, operation and safety. Basic hole layout, drilling and finish, measurement and quality control and installation of various rivets used in aerospace manufacturing will be covered.

AVIM 103 Aerospace Manufacturing Assembly Mechanic

3 Credits

Prerequisites: AVIM 101. The Aerospace Manufacturing Assembly Mechanic Concepts training program is designed to provide theory support and to prepare the learner to move into the application portion of the program. Skills and knowledge in aerospace manufacturing techniques are formed in preparation of hands-on application in the next phase of the program. This will give you an understanding of the products produced, as well as the tools, materials, and procedures you'll need to be successful as an employee of an aerospace manufacturing/maintenance organization. The following subject areas will be covered: Aerospace Manufacturing Orientation, Power Island Equipment, Basic Drilling & Riveting, Advanced Fasteners, Countersinking & Flush Riveting, 90 Degree Drilling, Wing Structure, Fuselage Skin, Drilling Titanium, Drilling Composite, Sealant Application, Electrical Bond & Composite Manufacturing.

AVIM 104 Wing & Fuselage Skin Assembly

6 Credits

Prerequisites: AVIM 101. This course is a continuation of the Aerospace Manufacturing certificate program. This course allows students to gain practical experience in the manufacture and assembly of a small wing and fuselage skin structure projects. This hands-on course will prepare students for entry-level positions in aerospace manufacturing.

AVIM 106 Advanced Material Drilling, Sealing, and Electrical Bonding

3 Credits

Prerequisites: AVIM 101. This course content focuses on proper drilling techniques utilized with composite and titanium materials. Students will demonstrate competency in sealing structures and electrical bonding component techniques.

AVIM 107 Advanced Fasteners and Countersinking

3 Credits

Prerequisites: AVIM 101. This course introduces the practical application of countersinking and flush riveting in aircraft assembly. Assembly and fastening processes including: 90 degree drilling, advanced fastener installation, safety wire procedures and manufacturing quality control measures will be covered in detail.

AVIM 109 Composite Manufacturing and Capstone Project

3 Credits

Prerequisites: AVIM 101. This course content includes practical exercises involved in composite manufacturing. Types of composite structures and the processes required to work with composite structures will be studied. Students will demonstrate competency in aerospace manufacturing via a capstone project.

AVIM 110 Aviation Manufacturing Mechanical I

2 Credits

Prerequisites: AVIM 101. This course is an introduction and demonstration of Power Island equipment, operation and safety. Basic hole layout, drilling and finish, measurement and quality control and installation of various rivets used in aerospace manufacturing will be covered.

AVIM 111 Aviation Manufacturing Mechanical II

6.5 Credits

Prerequisites: AVIM 110. This course introduces the practical application of countersinking and flush riveting in aircraft assembly. Assembly and fastening processes including: 90 degree drilling, advanced fastener installation, safety wire procedures and manufacturing quality control measures will be covered in detail. This course allows students to gain practical experience in the manufacture and assembly of a small wing and fuselage skin structure projects. This hands-on course will prepare students for entry-level positions in Aerospace manufacturing.

AVIM 112 Aviation Manufacturing Mechanical III

6.5 Credits

Prerequisites: AVIM 111. This course content focuses on proper drilling techniques utilized with composite and titanium materials. Students will demonstrate competency in sealing structures and electrical bonding component techniques.

AVIM 115 Aviation Manufacturing Electrical I

2 Credits

This course is a continuation of the Aviation Manufacturing Certificate program that will specialize in the Electrical Assembly Technician career pathway. The course is delivered via classroom lecture and hands-on skills lab formats. The content focuses on introductory electrical theory and practical hand tools and procedures.

AVIM 116 Aviation Manufacturing Electrical II

6.5 Credits

This hands-on course is a continuation of the Aviation Manufacturing Certificate program that will specialize in the Electrical Assembly Technician career pathway. The course is delivered via classroom lecture and hands-on skills lab formats. The content focuses on practical student experience in proper Basic Drilling and Riveting, Wire Bundle Basics, Installation Drawings, and Wire Bundle Installation.

AVIM 117 Aviation Manufacturing Electrical III

6.5 Credits

This hands-on course is a continuation of the Aviation Manufacturing Certificate program that will specialize in the Electrical Assembly Technician career pathway. The course is delivered via classroom lecture and hands-on skills lab formats. The content focuses on practical student experience in proper Electrical Grounding, Wiring Assembly, Coaxial Assembly, and Fiber Optics.

AVIT 111 Introduction to Aviation Technology

2 Credits

Prerequisites: None. Provides the student the opportunity to develop an understanding of various aspects of the aviation industry to include general regulations and laws associated with the field. Included is an overview of aviation field and all employment opportunities. Students will also learn of the departments associated with an airport and their impact on the industry as a whole.

AVIT 120 Private Pilot Theory

2 Credits

Prerequisites: None. Ground school knowledge required for certification as a private pilot with an airplane single engine land rating. Areas of student include aerodynamics, aircraft systems, performance, weight and balance, physiology, regulations, cross country planning, weather, and decision making skills.

AVIT 123 Part Time Private Pilot Flight Training I

1.5 Credits

Prerequisites: None. The student will obtain the knowledge, skill, and aeronautical experience necessary to meet the requirement for completing a solo flight and to begin cross country flight planning with a single-engine land airplane class rating. Although AVIT 120, Private Pilot Theory, is not a prerequisite to begin this course, the student must possess a passing score on the Private Pilot Knowledge Test, which is the result of AVIT 120, before one can take the Private Pilot Practical Test in order to receive the Private Pilot License. Upon successful completion of this course, the student will meet the training requirements and demonstrate proficiency that meets or exceeds the standard of performance outlined in the current FAA Private Pilot Practical Test Standards for solo flight and cross country flight planning.

AVIT 124 Part Time Private Pilot Flight Training II

1.5 Credits

Prerequisites: None. The student will obtain the knowledge, skill, and aeronautical experience necessary to meet the requirement for completing a solo flight and to begin cross country flight planning with a single-engine land airplane class rating. Although AVIT 120, Private Pilot Theory, is not a prerequisite to begin this course, the student must possess a passing score on the Private Pilot Knowledge Test, which is the result of AVIT 120, before one can take the Private Pilot Practical Test in order to receive the Private Pilot License. Upon successful completion of this course, the student will meet the training requirements and demonstrate proficiency that meets or exceeds the standard of performance outlined in the current FAA Private Pilot Practical Test Standards for solo flight and cross country flight planning.

AVIT 125 Private Pilot Flight Training

3 Credits

Prerequisites: None. Although AVIT 120 is not a prerequisite to begin this course, the student must possess a passing score on the Private Pilot Knowledge Test, which is the result of AVIT 120, before one can take the Private Pilot Practical Test in order to receive the Private Pilot License. The student will obtain the knowledge, skill, and aeronautical experience necessary to meet the requirement for a private pilot certificate with an airplane category rating and a single-engine land class rating. Upon successful completion of this course, the student will meet the training requirement and demonstrate proficiency that meets or exceeds the standard of performance outlined in the current FFA Private Pilot Practical Test Standards.

AVIT 132 Aviation Operations

3 Credits

Prerequisites: AVIT 111. An overview of general aviation operations, including the operation and management of the Fixed Base Operation (FBO). Emphasis will be placed on financial and operational considerations as well as on regulatory requirements and constraints.

AVIT 135 Aviation Security and Emergency Planning

3 Credits

Prerequisites: AVIT 111. This course introduces the challenges and complexity of aviation security faced by aviation professionals across the industry. It traces the evolution of current security approaches and explores technologies and processes targeting threat mitigation and improved operational efficiency.

AVIT 138 Aviation Weather Services

3 Credits

Prerequisites: None. An introduction to the aviation weather service program. Course includes the National Weather Service, Flight Service Stations, International Civil Aviation Organization, and analyzing and interpreting of weather reports and maps.

AVIT 141 Aviation Basics I

2 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 or MATH 023. Provides familiarization with aviation drawings and blueprint reading. The student learns the proper methods to weigh various aircraft and the requirements for weight-and-balance reporting. Fabrication of fluid lines for hydraulic, oxygen, and fuel systems is also covered.

AVIT 142 Aviation Basics II

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 or MATH 023. This is a math and physics review course with practical applications for aviation. The student reviews basic mathematical operations, determines areas of wing plan forms, and volumes of fuel tanks. Ratios and proportions are discussed as they apply to wings and aircraft engines. The operation of simple machines, aircraft nomenclature, and basic aerodynamics are also covered.

AVIT 144 Aircraft Electricity

4.5 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 or MATH 023. Introduces the student to the principles of basic electricity. The student learns Ohm's Law and the relationships of voltage, current, resistance, and power in DC electrical circuits. The relationships between RMS values of voltage and current, true and apparent power, reactance, and impedance using vector algebra in AC circuits are discussed. Electrical wiring in the aircraft, proper test equipment, basic troubleshooting, and battery servicing are also covered.

AVIT 145 Aircraft Ground Servicing

2 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better FOUN 071 or MATH 023. Focuses on the proper methods and safety procedures involved in working with aircraft on the ground. The student learns identification of aircraft fuels and refueling procedures and how to properly clean, inspect, and treat corrosion. Standard hand signals used with marshalling aircraft, engine run-up and taxiing procedures and ramp safety are also included.

AVIT 146 Aviation Regulations

2 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better FOUN 071 or MATH 023. Introduces the student to the Federal Aviation Regulations (FARs) pertaining to aviation maintenance (FAR Parts 23, 43, and 65), the Advisory Circulars (ACs) that expand upon these regulations, and proper record keeping for maintenance tasks performed on civil aircraft. Included are the format of technical publications and the various media (paper, microfiche, and CDRom) on which they are published.

AVIT 148 Aviation Materials and Processes

2 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better FOUN 071 or MATH 023. Provides an overview of aviation manufacturing and inspection methods. The student is introduced to processes and special tools used in aviation quality assurance.

AVIT 202 Instrument Pilot Theory

3 Credits

Prerequisites: AVIT 120 and AVIT 125. This course prepares students for certification as an Instrument Pilot and an Airplane Single Engine Land rating. Areas of study include basic instrument flying, flying instruments, IFR charts and approach plates, IFR regulations and procedures, ATC clearances, and IFR flight planning.

AVIT 205, Instrument Pilot Flight Training

1 Credit

Prerequisites: AVIT 120 and AVIT 125. The student will obtain the knowledge, skill, and aeronautical experience necessary to meet the requirement for an Instrument Pilot Certificate with an Airplane Category rating and a Single-Engine Land class rating.

Although AVIT 202, is not a prerequisite to begin this course, the student must possess a passing score on the Instrument Pilot Knowledge Test, which is the result of AVIT 202, before one can take the Instrument Pilot Practical Test in order to receive the Instrument Pilot License.

Upon successful completion of this course, the student will meet the training requirements and demonstrate proficiency that meets or exceeds the standard of performance outlined in the current FAA Instrument Pilot Practical Test Standards.

AVIT 208 Air Traffic Control

3 Credits

Prerequisites: AVIT 111. This course introduces students to the significant regulations impacting airline operations. Students will receive a comprehensive education on the structure of the National Airspace System with a focus on Air Traffic Control. Areas of study include airline operations, safety, and air traffic control operations – including how these areas work together to maintain scheduled operations, and air traffic control procedures.

AVIT 222 Non Metallic Structures

4.5 Credits

Prerequisites: AVIT 141, AVIT 142, AVIT 146 and AVIT 148. Introduces the student to inspecting and evaluation honeycomb and laminated structural damage as well as damaged transparent acrylic materials structures. The student becomes familiar with the methods involved in removing and repairing damaged honeycomb and laminated structural materials and repairing acrylic materials.

AVIT 226 Airframe Electrical Systems

2.5 Credits

Prerequisites: AVIT 144 and AVIT 146. Presents the theory of operation and proper methods of inspecting, servicing, troubleshooting, and repairing the various electrically powered aircraft systems. Included are power distribution systems for light and transport aircraft, power generation and regulation. Proper wiring techniques and connector repair. Speed and configuration warning systems areas are also covered.

AVIT 227 Aircraft Sheetmetal

7 Credits

Prerequisites: AVIT 141, AVIT 142, AVIT 146 and AVIT 148. Introduces the basic techniques necessary to perform sheet metal repairs on aircraft structures. Students develop skills in these areas: using sheet metal tools, laying out parts, forming parts with bending machines, and repairing various structural airframe components.

AVIT 228 Aircraft Instruments and Avionics**3 Credits**

Prerequisites: AVIT 144 and AVIT 146. This course covers the inspection, troubleshooting, and servicing of avionics and aircraft instruments installed in both general aviation and transport category aircraft. Included are basic theory of operation and the regulations pertaining to maintenance of instruments and avionics.

AVIT 231 Reciprocating Powerplants**7 Credits**

Prerequisites: AVIT 146 and AVIT 148. Covers overhaul, inspection, and removal of reciprocating engines. Students will perform a receiving inspection on an aircraft engine and perform a complete overhaul to operational condition. Students will also learn inspection and repair procedures specific to radial engines.

AVIT 229 Aviation Law**3 Credits**

Prerequisites: AVIT 111. This course introduces students to the legal structure of aviation. The course is designed to cover the basic legal principles surrounding aircraft acquisition, route planning, pilot and mechanic certification, FAA enforcement procedures, aviation tort litigation, as well as legal issues that airports and airlines may face.

AVIT 232 Turbine Powerplants**7 Credits**

Prerequisites: AVIT 146 and AVIT 148. Covers the overhaul of a turbine engine; and the inspection, checking, servicing, repair, and removal/installation of turbine engines. Students will perform a receiving inspection on an aircraft engine and perform a complete overhaul.

AVIT 233 Powerplant Fuel and Induction Systems**2.5 Credits**

Prerequisites: AVIT 146 and AVIT 148. Studies fuel metering systems in reciprocating powerplants. Airflow through turbines, superchargers and carburetors are discussed. Students overhaul carburetors to supplement theory discussions in this area. Engine cooling systems are also covered.

AVIT 235 Powerplant Fluid and Indicating Systems**2.5 Credits**

Prerequisites: AVIT 144 and AVIT 146. Covers lubricating systems in reciprocating and turbine engines. Indicating systems, reciprocating and turbine-engine electrical systems and engine instruments are also covered. Students inspect, check, troubleshoot, and repair engine fire detection systems.

AVIT 237 Propellers**4.5 Credits**

Prerequisites: AVIT 141, AVIT 146 and AVIT 148. Covers the inspection, repair, and troubleshooting of propeller control systems. The removal, installation, and balancing of propellers are also covered.

AVIT 241 Aircraft Fuel System and Welding Practices**3 Credits**

Prerequisites: AVIT 141, AVIT 146 and AVIT 148. Introduces the student to aircraft welding methods. These methods will include the welding of magnesium, titanium, stainless steel, and aluminum as well as fabrication of tubular structures. An additional major emphasis is aircraft fuel systems. This will include fuel dump systems, transfer systems, pressure fueling, and fluid quantity indicating. Transfer and troubleshooting of systems is also covered.

AVIT 242 Aircraft Inspection and Rigging**4.5 Credits**

Prerequisites: AVIT 226, AVIT 245 and AVIT 246. Introduces the student to aircraft assembly, rigging and airframe inspection. This will include the rigging of fixed wing aircraft and rotary wing aircraft. Students will be instructed in the alignment of structures, assembly of aircraft components including flight control surfaces, balance and rigging of movable control surfaces. In addition they will do airframe inspection and conformity inspection.

AVIT 243 Aircraft Hydraulic and Pneumatic Systems**3 Credits**

Prerequisite: AVIT 142, AVIT 145, AVIT 146, AVIT 148. Present the theory and practical application of aircraft hydraulic and pneumatic systems as it relates to landing gear. Wing de-ice, and environmental systems is also covered.

AVIT 244 Aircraft Landing Gear Systems**2.5 Credits**

Prerequisites: AVIT 243. Introduces the student to safely putting an aircraft on jack stands for service. Also covers the inspection, service and repair of landing gear and retraction systems, shocks, struts, brakes, wheels, tires and steering systems. In addition student will learn to inspect, troubleshoot and service landing gear position and indicating warning systems.

AVIT 245 Aircraft System**2.5 Credits**

Prerequisites: AVIT 141, AVIT 146, and AVIT 148. Introduces students to various aircraft cabin atmosphere systems. Students will be introduced to instrument static pressure leak checks. They will also work on and be introduced to various warning systems, electric brake control, and anti-skid systems.

AVIT 246 Aircraft Hydraulic and Landing Gear Systems **4.5 Credits**

Prerequisites: AVIT 142, AVIT 145, AVIT 146, AVIT 148. Present the theory and practical application of aircraft hydraulic and pneumatic systems as it relates to landing gear. Wing de-ice, and environmental systems is also covered. Introduces the student to safely putting an aircraft on jack stands for service. Also covers the inspection, service and repair of landing gear and retraction systems, shocks, struts, brakes, wheels, tires and steering systems. In addition student will learn to inspect, troubleshoot and service landing gear position and indicating warning systems.

AVIT 250 Multi-Engine/Commercial Theory **3 Credits**

Prerequisites: AVIT 202. Instruction in techniques of multi-engine aircraft operations. Students will qualify under Part 141 for the FAA Multi-Engine Land Certificate.

AVIT 251 Engine Cooling and Exhaust **3 Credits**

Prerequisites: AVIT 146 and AVIT 148. Introduces students to various methods of engine cooling on piston and turbine engines. This will also introduce superchargers, heat exchangers, mufflers, repairing cylinders on piston engines and the use of thruster reversers on turbine engines.

AVIT 252 Engine Install, Conformity, and Ignition **2.5 Credits**

Prerequisites: AVIT 233, AVIT 235, AVIT 251 and AVIT 253. Students will remove and install piston and turbine engines. They will learn how to pre oil an engine after rebuild. They will troubleshoot, service, turbine engine exhaust nozzles. They will learn ignition harnesses, turbine engine ignitions and magneto overhaul.

AVIT 253 Engine Starting System **2.5 Credits**

Prerequisites: AVIT 144 and AVIT 146. Introduces reciprocating and turbine engine electrical systems. Students will inspect, service, troubleshoot, and repair turbine pneumatic starting systems and turbine ignitions.

AVIT 254 Aircraft Systems **3 Credits**

Prerequisites: AVIT 111 and PHYS 100 or SCIN 101. This course serves as an introduction to reciprocating propulsion systems used on modern single and multi-engine aircraft. The student will learn the industry terminology and operational theory of reciprocating propulsion systems and gain an introduction to turbine and jet engines.

AVIT 255 Multi-Engine/Commercial Flight **2 Credits**

Prerequisites: AVIT 202 and AVIT 205. Instruction in techniques of multi-engine aircraft operations. Student will qualify under Part 141 for the FAA Multi-Engine Land Certificate. Student will begin and continue flight training toward a FAA Single-Engine Land Commercial Certificate.

AVIT 275 Commercial Flight II **1 Credit**

Prerequisites: AVIT 250 and AVIT 255. Continuation of flight training towards the Commercial Pilot Certificate. Emphasis on advanced commercial maneuvers, complex airplane systems and cross country flying.

AVIT 279 Aviation Career Planning **1 Credit**

Prerequisites: This course constitutes the Capstone Class. Career planning for students starting a career in the aviation flight or management industry. Topics of study include resume building, interview process, industry management functions, passenger forecasting methods, and current events in the industry.

BCOM 100 Technology for Construction **3 Credits**

Prerequisite: None. Students are introduced to current applications and technology used in the construction field. Focus is placed on hands on software training related to the building construction industry.

BCOM 102 Construction Blueprint Reading **3 Credits**

Prerequisites: None. Provides instruction and practice in the use of working drawings and applications from the print to the work. Includes relationship of views and details, interpretation of dimension, transposing scale, tolerance, electrical symbols, sections, materials list, architectural plans, room schedules and plot plans.

BCOM 103 Green Construction **3 Credits**

Prerequisites: None. Students gain knowledge and understanding of environmentally sustainable (green) and economically justifiable building construction techniques and methods. The course also focuses on trends in the use of alternative materials and designs in both the residential and commercial/industrial building construction markets.

BCOM 104 Construction Materials **3 Credits**

Prerequisites: None. Develops skills in identifying building materials commonly used in modern building construction. Provides experience in the application of locally accessible materials.

BCOM 105 Concrete and Soils

4 Credits

Prerequisites: None. Concrete and Soils is an introductory study of the properties and uses of concrete in construction. Emphasis is placed on quality control in the field. Other topics include: design and methods of form work, placing, curing, and finishing. 25% of the course content will cover the properties and behavior of soils including compaction, permeability, compressibility, and shear strength. Course content is consistent with principles and standards as determined by the Portland Cement Association (PCA), the American Concrete Institute (ACI), the Construction Specifications Institute (CSI), and the American Society for Testing Materials (ASTM). This course incorporates mandatory certification assessments for the Concrete Field Testing Technician – Grade I Certification.

BCOM 115 Introduction to Construction Management

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095 or FOUN 071. Students gain knowledge and understanding of management functions in the building construction industry including project cycle and company/project organization. Emphasis is placed on the responsibilities of project estimators, project managers, and site superintendents.

BCOM 206 Construction Estimating

3 Credits

Prerequisites: BCOM 102 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or FOUN 071. Students will study fundamentals of performing construction estimates including making material quantity take-offs and labor estimates. The Construction Specifications Institute (material divisions) will be used to organize the estimating process. Emphasis is placed on interpreting plans and specifications to determine accurate material quantities and labor estimates, selection of appropriate material grades and types, and other miscellaneous cost associated with successful completion of a building project.

BCOM 208 Construction Business Management

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095, and BCOM 115. Students gain knowledge and understanding of the business management functions in the construction industry and describes the functions of managers, including the management of activities, finances, business development, and personnel. The course focuses on application of guiding principles in construction management. It introduces the basic principles of accounting including debit and credit, balance sheets and income statements. In addition, it addresses marketing in relation to market analysis, plans and acquisition of work.

BCOM 210 Codes and Specifications

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095 or FOUN 071. A study of the interpretation of technical building specifications, codes, and contract documents as they affect the selection, and application of materials and equipment. The course will emphasize understanding of local and state codes and will incorporate a mandatory ICC certification examination.

BCOM 219 Survey and Measurement

3 Credits

Prerequisites: None. Presents fundamental construction field engineer responsibilities including topics such as distance measurement, angle measurement, total station use, differential leveling, and lasers. Various methods of construction layout will also be covered in this course.

BCOM 220 Project Planning and Control

3 Credits

Prerequisites: Program Advisor Approval. Covers the concepts and techniques for scheduling and control systems for effectively managing a construction project. Students will obtain the skills and knowledge necessary to effectively plan and schedule a project, to monitor and control all project aspects, and to anticipate and resolve problems as they occur.

BCOM 223 Advanced Estimating

3 Credits

Prerequisites: BCOM 206. The second of two estimating courses with emphasis on using specialized software to perform estimating and cost | control tasks. Estimating projects are focused on commercial and industrial construction.

BCOM 230 Construction Equipment

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or successful completion of MATH 023 or FOUN 071. Introduces principles and techniques for selecting and managing construction equipment. Identification and evaluation of types of site equipment including hand tools, power equipment, earthmoving/excavation equipment, etc. Emphasis is placed on estimating and analysis of equipment productivity, ownership and operating cost.

BCOM 235 Safety and Risk Management

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093, and ENGL 083. Emphasis is placed on identifying and reducing safety risk on the job site. Students will study OSHA standards, accident and fire prevention, protection from hazardous materials, use of protective equipment and clothing, construction equipment and other safety concerns. The role of managers, workers, sub-contractors and others is stressed. Student will gain an appreciation for how accidents and safety concerns affect morale and productivity. This course incorporates mandatory certification assessment for the OSHA 30 Hour Safety Certification.

BCOM 240 Professional Internship **3 Credits**

Prerequisites: Program Advisor Approval. Major focus is to provide practical on-the-job experience working with a construction company. Student interns might work in the areas of print reading, estimating, equipment management, project supervision, or other management related activities and tasks.

BCOT 104 Floor and Wall Layout and Construction **3 Credits**

Prerequisites: CONT 101. Examines the design and construction of floor and wall systems. Student develops the skill needed for layout and construction of floor and wall systems from blueprints and professional planning documents.

BCOT 105 Roof Construction **3 Credits**

Prerequisites: CONT 101. Studies the design and construction of roof systems. Emphasizes use of the framing square for traditional rafter and truss roofing. Instruct students in additional up-to-date techniques.

BCOT 107 Electrical Blueprint Reading/NEC **3 Credits**

Prerequisites: CONT 127 or INDT 113. An introduction to the skills in basic electrical print interpretation and understanding electrical symbols, presenting the student with the electrical design problems and related calculations in accordance with the most current NEC. Emphasis is placed on reading blueprints and specifications for a single-family dwelling, multi-family dwelling, commercial and industrial applications and hazardous locations. The student will be using a new computer assisted program to assist with estimating a project. Emphasis will be placed on understanding residential and commercial standards and the proper development of mechanical engineering drawings.

BCOT 110 Cabinetry **3 Credits**

Prerequisites: None. Develops knowledge and skills in building of cabinets, including methods of construction, necessary hardware and installation; also use of portable power tools and stationary power tools.

BCOT 113 Interior Finish **3 Credits**

Prerequisite: CONT 101. Develops basic knowledge, skills, and awareness of interior trim. Provides training in installation of drywall, moldings, interior doors, kitchen cabinets, and baseboard moldings.

BCOT 114 Exterior Finish **3 Credits**

Prerequisites: CONT 101. Develops necessary skills in the finishing of the exterior of a building. The student obtains skills in the installation of the cornice, windows, doors and various types of sidings used in today's market place.

BCOT 115 Auxiliary Building Design and Construction **3 Credits**

Prerequisites: CONT 101. Develops carpentry skills in construction of garages, storage buildings, wood decks, patios, privacy fences and gazebos.

BCOT 120 Woodworking Fundamentals **3 Credits**

Prerequisites: None. An introductory study of the basic skills in woodworking. Emphasis is placed on safety, tool set-up and machine operations. Other topics include proper joinery and material selection.

BCOT 121 Furniture Design and Construction **3 Credits**

Prerequisites: BCOT 120. Develops skills in the design, layout, and construction of furniture. Students are introduced to furniture styles, types of materials used, and methods of construction.

BCOT 122 Woodworking Jig Layout **3 Credits**

Prerequisites: BCOT 120. Develops skills in the design, layout and construction of holding devices, called jigs, used for special setups on the table saw, joiner band saw, and other woodworking machines. Each jig can be a single function, or a multi-functioning jig.

BCOT 123 Furniture Framework **3 Credits**

Prerequisites: None. Introduces the basic skills and technology of furniture construction, focusing on case construction, face frames and furniture legs.

BCOT 124 Millwork **3 Credits**

Prerequisites: BCOT 120. Introduces the basic skills and technology of the production of wood products and focuses on machinery set-up and operations for making moldings, doorframes and picture frames.

BCOT 125 Furniture Finishing and Repair **3 Credits**

Prerequisites: None. Develops knowledge and skills in the technology of refinishing and repairing furniture. Introduces procedures used in stripping, bleaching, caning, veneering and wood fillers.

BCOT 126 Furniture Door and Drawer Assembly **3 Credits**

Prerequisites: BCOT 120. An advanced class that develops skills in the design, layout, and construction of doors, drawers, and tabletops. Students are introduced to various types of hardware and installation methods.

BCOT 127 Basic Theory of Paint and Stain **3 Credits**

Prerequisites: None. Introduces the basic skills and techniques of finishing wood products, including proper preparation, staining and finishing procedures.

BCOT 128 Woodworking Hobbies and Crafts **3 Credits**

Prerequisites: None. Introduces the basic skills and techniques in layout and construction of small projects such as bookcases, file cabinets, and mantels. Introduces the skills in layout and assembly of small hobby projects such as kitchen accessories, and living room, bedroom decorations.

BCOT 129 Residential Wiring **3 Credits**

Prerequisites: CONT 127 or INDT 113. Covers the practice of residential wiring, including electrical service, metering equipment, lighting, switches, outlets and other common components, and methods of installation and maintenance of the residential wiring system in accordance with the current National Electrical Code.

BCOT 130 Home Inspection **3 Credits**

Prerequisite: None. This course is designed to review the way buildings are designed and constructed, which areas of buildings should be inspected, and how to inspect them. Students will learn to prepare an inspection report; reports designed to meet the specifications of lending institutions and other organizations requiring home inspection services.

BCOT 131 Residential Building Codes **3 Credits**

Prerequisite: None. Introduces the students to building code requirements in Indiana. Students will become familiar with the current code book and how to use it. Emphasis will be placed on examining those provisions that apply to general contractors.

BCOT 135 Controlled Computer Woodworking **3 Credits**

Prerequisites: None. An introductory course in using a computer controlled wood router to assist in creating better woodworking projects. Information on design and function of computer controlled routers, the software used for design, tool path generation and machine control is also discussed. Examples will be created to demonstrate techniques and methods of producing various two dimensional and three dimension projects.

BCOT 171 Landscape Construction **3 Credits**

Prerequisites: None. Study design and construction of various landscape construction systems. Emphasize use of the landscape tools and methods for exterior design. Instruct students in additional up-to-date techniques and materials. Introduces "green" practices.

BCOT 172 Kitchen and Bath Construction **3 Credits**

Prerequisites: None. Involves the requirements and space planning for kitchens and baths, utilizing both standard and custom cabinetry and fixtures. Topics also include plumbing, electrical and current technologies available in these environments.

BCOT 202 Plumbing Fundamentals **3 Credits**

Prerequisites: None. Studies the operation and function of the home plumbing system. Introduces pipe drawings and pipe layout and isometric blueprint reading symbols. Demonstrates how to rough in plumbing and install drainage, water systems, fixtures and water heaters in compliance with the plumbing code.

BCOT 203 Masonry Concrete Fundamentals **3 Credits**

Prerequisites: None. Covers materials and methods of construction with concrete block, brick, and forming for poured concrete. Includes study in the preparation of the building site.

BCOT 207 Carpentry-Light Commercial **3 Credits**

Prerequisites: None. Introduces carpentry skills required in light commercial construction. Focuses on construction methods and materials used for office buildings, clinics, small churches and other non-residential structures.

BCOT 208 Electrical Estimating **3 Credits**

Prerequisite: CONT 127 or INDT 113. This course presents the student with the electrical estimating process for residential and light commercial construction. Emphasis is placed on reading blueprints and specifications, estimating labor, materials, and associated costs. The student will be using a new computer assisted program to assist with estimating a project.

BCOT 211 Construction Organization and Procedures **3 Credits**

Prerequisites: None. Introduces organization and management procedures focusing on subcontracting, equipment and tool inventories, job materials, codes, inspections and permits.

BCOT 213 Motors and Motor Controls **3 Credits**

Prerequisites: CONT 127 or INDT 113. Studies the wiring and design of motor control circuits, including circuit and conductor calculations, motor circuits and controls. Includes control transformers and service, circuit layout for motor controls and machine tool hookup and control.

BCOT 214 Wall and Floor Coverings

3 Credits

Prerequisites: None. Covers modern materials and techniques of interior floor and wall coverings. Provides instruction on assessing the durability and maintenance of materials and techniques in correct installation procedures.

BCOT 216 Advanced Residential Design

3 Credits

Prerequisites: Program Advisor Approval. Studies residential floor plans and elevation. Analyzes contemporary living patterns, cost, privacy, convenience and efficiency, coordinated with needs. Compares exterior styles for cost and aesthetic values. Studies multiple housing, duplex arrangements, apartments and condominiums. Provides students with opportunities to do floor plans, elevations, and perspective drawings to incorporate the conclusions reached from research.

BCOT 220 Electrical Troubleshooting Techniques

3 Credits

Prerequisites: CONT 127 or INDT 113. Presents methods and techniques for troubleshooting appliances, motors, motor controls, relay wiring, commercial wiring and industrial wiring systems.

BCOT 222 Commercial/Industrial Wiring

3 Credits

Prerequisites: CONT 127 or INDT 113. Covers wiring methods and material selection for commercial and industrial wiring systems. Studies include mechanical installation of hardware as well as electrical design and layout. Focuses on tool use, material selection, and installation of machines in the industrial setting.

BCOT 223 Plumbing Design and Installation

3 Credits

Prerequisites: BCOT 202. Provides techniques for working with pipes and fittings. Studies residential and commercial electrical hot water heating systems, private well water systems and electrical components of plumbing systems.

BCOT 225 Fabrication

3 Credits

Prerequisites: Program Advisor Approval. Studies concepts and techniques of industrialized housing. Covers pre-fabrication, fabrication, jigs and rigging, including manufactured housing, sectional homes and modular homes.

BCOT 228 Advanced Woodworking

5 Credits

Prerequisites: BCOT 120. Applies problem-solving solutions in furniture construction, as well as cabinetry construction and installation.

BCTI 100 Introduction to Construction Technology

3 Credits

Prerequisites: None. This course covers the NCCER Core Curriculum and is a prerequisite to most other construction courses. Its modules cover topics such as basic safety, communication skills, and introduction to construction drawings; all basic skills needed to continue education in the construction program. The NCCER Core Curriculum certificate and wallet card will also be awarded upon successful completion of this course.

BCTI 101 Introduction to Carpentry, Part I

3 Credits

Prerequisites: BCTI 100. This course covers the first half of NCCER Carpentry Level I. Its modules cover topics such as building materials, fasteners, adhesives, hand and power tools, introduction to construction drawings, specifications, layout, and floor systems. The NCCER Carpentry Level I certificate and wallet card will not be awarded until the student successfully completes both this course and BCTI 102.

BCTI 102 Introduction to Carpentry, Part 2

3 Credits

Prerequisites/Corequisites: BCTI 101. This course covers the second half of NCCER Carpentry Level I. Its modules cover topics such as wall systems, ceiling joist and roof framing, basic stair layout, and introduction to building envelope systems. The NCCER Carpentry Level I certificate and wallet card will also be awarded upon successful completion of this course.

BCTI 103 Carpentry Framing and Finishing, Part I

3 Credits

Prerequisites: BCTI 100. This course covers the first half of NCCER Carpentry Framing and Finishing Level 2. Its modules cover topics such as commercial drawings, roofing applications, thermal and moisture protection, exterior finishing, and cold-formed steel framing. The NCCER Carpentry Framing and Finishing Level 2 certificate and wallet card will not be awarded until the student successfully completes both this course and BCTI 104.

BCTI 104 Carpentry Framing and Finishing, Part 2

3 Credits

Prerequisites/Corequisites: BCTI 103. This course covers the second half of NCCER Carpentry Framing and Finishing Level 2. Its modules cover topics such as drywall installation and finishing, doors and door hardware, suspended ceilings, window, door, floor, and ceiling trim, and cabinet installation. The NCCER Carpentry Framing and Finishing Level 2 certificate and wallet card will also be awarded upon successful completion of this course.

BCTI 110 Introduction to Concrete Finishing

3 Credits

Prerequisites: BCTI 100. This course covers NCCER Concrete Finishing Level I. Its modules cover topics such as introduction to concrete construction and finishing, safety requirements, properties of concrete, tools and equipment, preparing for placement, placing concrete, finishing, curing and protecting concrete, and introduction to troubleshooting. The NCCER Concrete Finishing Level I certificate and wallet card will also be awarded upon successful completion of this course.

BCTI 130 Introduction to Electrical

4 Credits

Prerequisites: None. This course covers NCCER Electrical Level I. Its modules cover topics such as orientation to the electrical trade, electrical safety, introduction to electrical circuits, electrical theory, introduction to the National Electrical Code, device boxes, hand bending, raceways and fittings, conductors and cables, basic electrical construction drawings, residential electrical services, and electrical test equipment. The NCCER Electrical Level I certificate and wallet card will also be awarded upon successful completion of this course.

BCTI 131 Electrical, Part I

3 Credits

Prerequisites: BCTI 130. This course covers the first half of NCCER Electrical Level 2. Its modules cover topics such as alternating current, motors: theory and application, electric lighting, conduit bending, and pull and junction boxes. The NCCER Electrical Level 2 certificate and wallet card will not be awarded until the student successfully completes both this course and BCTI 132.

BCTI 132 Electrical, Part 2

3 Credits

Prerequisites/Corequisites: BCTI 131. This course covers the second half of NCCER Electrical Level 2. Its modules cover topics such as conductor installations, cable tray, conductor terminations and splices, grounding and bonding, circuit breakers and fuses, control systems and fundamental concepts. The NCCER Electrical Level 2 certificate and wallet card will also be awarded upon the successful completion of this course.

BCTI 140 Introduction to Masonry

3 Credits

Prerequisites: BCTI 100. This course covers NCCER Masonry Level 1. Its modules cover topics such as introduction to masonry, masonry tools and equipment, measurements, drawings and specifications, mortar and masonry units, and installation techniques. The NCCER Masonry Level I certificate and wallet card will also be awarded upon successful completion on this course.

BCTI 150 Introduction to Plumbing, Part I

3 Credits

Prerequisites: BCTI 100. This course covers the first half of NCCER Plumbing Level I. Its modules cover topics such as introduction to the plumbing profession, plumbing safety, tools of the plumbing trade, introduction to plumbing math, introduction to plumbing drawings, and plastic pipe and fittings. The NCCER Plumbing Level I certificate and wallet card will not be awarded until the student successfully completes both this course and BCTI 151.

BCTI 151 Introduction to Plumbing, Part 2

3 Credits

Prerequisites/Corequisites: BCTI 150. This course covers the second half of NCCER Plumbing Level I. Its modules cover topics such as copper pipe and fittings, cast-iron pipe and fittings, carbon steel pipe and fittings, introduction to plumbing fixtures, introduction to drain, waste, and vent (DWV) systems, and introduction to water distribution systems. The NCCER Plumbing Level I certification and wallet card will also be awarded upon successful completion of this course.

BCTI 160 Introduction to Site Layout

3 Credits

Prerequisites: None. This course covers NCCER Site Layout. Its modules cover topics such as introduction to site layout, surveying math, survey equipment use and care, and blueprint reading for surveyors. The NCCER Site Layout certificate and wallet card will also be awarded upon successful completion of this course.

BCTI 201 Carpentry Forms, Part I

3 Credits

Prerequisites: BCTI 100. This course covers the first half of NCCER Carpentry Forms Level 3. Its modules cover topics such as rigging equipment, rigging practices, properties of concrete, reinforcing concrete, trenching and excavating, foundations, and slab-on-grade. The NCCER Carpentry Forms Level 3 certificate and wallet card will not be awarded until the student successfully completes both this course and BCTI 202.

BCTI 202 Carpentry Forms, Part 2

3 Credits

Prerequisites/Corequisites: BCTI 201. This course covers the second half of NCCER Carpentry Forms Level 3. Its modules cover topics such as handling and placing concrete, vertical formwork, horizontal formwork, and tilt-up wall panels. The NCCER Carpentry Forms Level 3 certificate and wallet card will also be awarded upon successful completion of this course.

BCTI 203 Carpentry Advanced, Part I

3 Credits

Prerequisites: BCTI 100. This course covers the first half of NCCER Carpentry Advanced Level 4. Its modules cover topics such site layout one – distance measurement and leveling, site layout two – angular measurement, and advanced roof systems. The NCCER Carpentry Advance Level 4 certificate and wallet card will not be awarded until the student successfully completes both this course and BCTI 204.

BCTI 204 Carpentry Advanced, Part 2

3 Credits

Prerequisites/Corequisites: BCTI 203. This course covers the second half of NCCER Carpentry Advanced Level 4. Its modules cover topics such as advanced wall systems, advanced stair systems, introduction to light equipment, site preparation, and introductory skills for the crew leader. The NCCER Carpentry Advanced Level 4 certificate and wallet card will also be awarded upon successful completion of this course.

BCTI 205 Cabinetmaking

3 Credits

Prerequisites: None. This course covers NCCER Cabinetmaking. Its modules cover topics such as introduction to the materials, tools, and methods used in cabinetmaking. Practice projects help the student learn the various joining techniques while providing practice on stationary power tools. The NCCER Cabinetmaking certificate and wallet card will also be awarded upon successful completion of this course.

BCTI 206 Landscape Construction

3 Credits

Prerequisites: None. This course studies the design and construction of various landscape construction systems. Emphasis is placed on the use of landscape tools and methods for exterior design. Instruction is provided on additional up-to-date techniques and materials including sustainable practices.

BCTI 231 Intermediate Electrical, Part I

3 Credits

Prerequisites: BCTI 130. This course covers the first half of NCCER Electrical Level 3. Its modules cover topics such as load calculations – branch and feeder circuits, conductor selection and calculations, practical applications of lighting, hazardous locations, and overcurrent protection. The NCCER Electrical Level 3 certificate and wallet card will not be awarded until the student successfully completes both this course and BCTI 232.

BCTI 232 Intermediate Electrical, Part 2

3 Credits

Prerequisites/Corequisites: BCTI 231. This course covers the second half of NCCER Electrical Level 3. Its modules cover topics such as distribution equipment, transformers, commercial electrical services, motor calculations, voice, data, video, and motor controls. The NCCER Electrical Level 3 certificate and wallet card will also be awarded upon successful completion of this course.

BCTI 233 Advanced Electrical, Part I

3 Credits

Prerequisites: BCTI 130. This course covers the first half of NCCER Electrical Level 4. Its modules cover topics such as load calculations – feeders and services, health care facilities, standby and emergency systems, basic electronic theory, fire alarm systems, specialty transformers, and advanced controls. The NCCER Electrical Level 4 certificate and wallet card will not be awarded until the student successfully completes both this course and BCTI 234.

BCTI 234 Advanced Electrical, Part 2

3 Credits

Prerequisites/Corequisites: BCTI 233. This course covers the second half of NCCER Electrical Level 4. Its modules cover topics such as HVAC controls, heat tracing and freeze protection, motor operation and maintenance, medium-voltage terminations/splices, special locations, and fundamentals of crew leadership. The NCCER Electrical Level 4 certificate and wallet card will also be awarded upon successful completion of this course.

BCTI 270 Project Supervision

3 Credits

Prerequisites: Program Chair Approval. This course covers NCCER Project Supervision. It is a comprehensive, competency-based course that gives both veteran and new field managers a step-by-step approach to honing their natural abilities, developing essential skills, and generally improving their performance as leaders. Topics such as human relations and problem solving, safety, and quality control will be covered. The NCCER Project Supervision certificate and wallet card will be awarded upon successful completion of this course. This class also requires taking the outcomes assessment (CAAP) test.

BCTI 280 Co-Op/Internship

1-6 Credits

Prerequisites: Program Chair Approval. Gives students the opportunity to work at a job site that is specifically related to their career objectives. Provides on-the-job experience while earning credit toward an associate degree.

BCTI 281 Advanced Projects in Building Construction I

3 Credits

Prerequisites: BCTI 100. Applies problem solving to common problems in construction. Emphasizes the cooperation between several trades in the construction industry.

BCTI 282 Advanced Projects in Building Construction II

3 Credits

Prerequisites: BCTI 281. Applies problem-solving skills to common challenges in construction. Emphasizes the cooperation between several trades in the construction industry allowing students to practice necessary skills to resolve the problem. Concentrates on decision-making skills.

BIOL 065 Basic Life Sciences

3 Credits

Prerequisites: None. Introduces the scientific method and the basic concepts and terminology used in biology, microbiology, anatomy, physiology and organic chemistry which is related to life sciences. Prepares entering students who took no high school science or who took science several years ago for general education life sciences courses.

BIOL 100 Human Biology

Transfer IN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. This course is a study of the biology of the human organism. It includes an examination of organizational complexity, development, health, and the place of humans in the natural world.

BIOL 101 Introductory Biology

Transfer IN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095, and MATH 023 or MATH 080 or FOUN 071. Introduces the basic concepts of life. Includes discussion of cellular and organismal biology, evolution, ecology, and interaction among all living organisms. Addresses applications of biology in a global community.

BIOL 105 Biology I Molecular and Cellular Processes

Transfer IN 5 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C or better" in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. Course presents an in-depth introduction to biology including the basic principles of biochemistry, concepts of cell structure, cell metabolism, and cellular respiration, processes of DNA replication and gene expression, principles of molecular and Mendelian genetics, concepts of Natural Selection in relation to evolution, and diversity of prokaryotes, protists, and green plants. *Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.*

BIOL 107 Biology II Diversity of Life

Transfer IN 5 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C or better" in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. Presents an in-depth introduction to biology including a survey of animal diversity, the fundamentals of plant and animal structure and function, principles of animal reproduction and development, and an overview of vertebrate anatomy, and coverage of population, community. Systems ecology and behavioral ecology.

BIOL 110 Entomology

4 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. This course will cover basic entomological concepts, including structure and function, behavior, evolution and ecology. We will review insect order and look at how insects interact with human societies.

BIOL 120 Environmental Science

4 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. Survey of the basic concepts of ecology, natural resources and ecosystems, relationships between humans and their natural environment, and the magnitude and scope of global environmental problems.

BIOL 121 General Biology I

4 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. Students will be introduced to those biological and chemical principles associated with cell structure and function, cell division, molecular and Mendelian genetics, enzyme function and energetics. An overview of natural selection, the structure, lifecycle and classification schemes of vascular plants will also be presented.

BIOL 122 General Biology II

4 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. Students will be introduced to those principles associated with evolution, form and function of plants and animals, and ecology. The course will trace the evolution of organisms and explore plant structures, development and interaction with their environment. Students will look at anatomy, physiology, development and behavior of animals and will learn aspects of conservation biology.

BIOL 201 General Microbiology

4 Credits

Prerequisites: BIOL 105, BIOL 121, or APHY 101 and earning a grade of "C" or better in MATH 023 or MATH 080. Presents an in-depth overview of microbiology, including fundamental structures of microorganisms, their metabolism, classification and interaction with other living things, and the laboratory techniques for their study. Introduces industrial and clinical applications of microbiology and clinically related areas of bacterial, viral, fungal, and parasitic involvement.

BIOL 202 General Microbiology II

2 Credits

Prerequisites: BIOL 201 or BIOL 211. A secondary study of microorganisms, including the characterization of bacterial growth and techniques of controlling microbial growth. Provides in-depth coverage of analytical and serological techniques commonly encountered in the microbiology laboratory. Includes lab.

BIOL 211 Microbiology I

Transfer IN 3 Credits

Prerequisites: BIOL 105, BIOL 121, or APHY 101 and earning a grade of "C" or better in MATH 023 or MATH 080. Presents an overview of microbiology including fundamental structures of microorganisms, their metabolism, classification and interaction with other living things, and the laboratory techniques for their study. Introduces industrial and clinical applications of microbiology.

BIOL 221 Molecular Biology

4 Credits

Prerequisites: BIOL 121 General Biology or BIOL 105 Biology I. Corequisites: CHEM 105 General Chemistry I or CHEM 111 Chemistry I. This course will introduce DNA, RNA and proteins and review their structures and functions, including their physical and chemical properties and their roles in cellular metabolism. The course will include an in-depth look at the synthesis of these molecules, as well as DNA replication, transcription and translation.

BIOL 222 Genetics

4 Credits

Prerequisites: BIOL 105, CHEM 105. This course presents an in-depth overview of genetics including the DNA as the material of heredity, DNA replication and gene expression. The course also explores population genetics, genetics of prokaryotes, eukaryotes and viruses, DNA biotechnology, principles of Mendelian and non-Mendelian genetics and the genetic basis of disease.

BIOL 240 Ecology

4 Credits

Prerequisites: BIOL 105, BIOL 107, CHEM 105. This course examines the complex interrelationships between organisms and the natural world. Contemporary issues in population, community and ecosystem ecology are emphasized as they relate to evolution and biodiversity, resource acquisition and resource utilization within an ecosystem. Course content includes competitive exclusion, resource partitioning, trophic status, food webs, succession and biogeochemistry using examples from current and historical literature. Students will be challenged to think about how ecological patterns and processes inform the regional and global issues facing human society.

BIOL 279 Introduction to Scientific Research

1 Credit

Prerequisites: BIOL 105 or BIOL 121, MATH 136 and Program Chair Approval. Students will be introduced to those principles associated with scientific research. The course will be tailored to individually expose each student to research associated with their discipline or sub-discipline. Students will be instructed on basic research principles, develop a testable hypothesis, design a research project that tests their hypothesis, and present their findings in both written and presentation form. Written form will follow the format of an international journal that represents the student's discipline. Presentations can be either poster or oral, and should reflect the discipline standard.

BIOL 283 Special Topics-Marine Biology

3 Credits

Prerequisites: BIOL 101 Introductory Biology and Program Chair Approval. Corequisites: BIOL 105, BIOL 107, BIOL 121, or BIOL 122
This course will provide an introduction to the science of marine biology. Topics include coverage of plant, invertebrates, and vertebrates' marine life. Additional topics include the ecology of marine populations, communities and ecosystems, oceanography, marine resources, and conservation of marine species and ecosystems. The class will spend Spring Break studying marine communities and diversity in the Florida Keys. Moderate extra costs for lodging and food, and travel to the field site are the responsibility of the student.

BIOT 100 Survey of Biotechnology

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and MATH 044 or MATH 015. Presents an in-depth overview of biotechnology emphasizing basic molecular techniques of manipulating DNA; processes involved in protein purification and analysis; microbial, plant, aquatic, medical and animal biotechnology; regulations and ethics of the biotechnology industry.

BIOT 101 Introduction to Biotechnology

4 Credits

Prerequisites: BIOL 105 or BIOL 121. Presents a basic overview of biotechnology emphasizing current DNA and RNA technologies and structure and function of biomolecules. The application of these techniques in the field of medicine, agriculture, forensics and environment is emphasized. Scientific methods, lab safety and regulations and ethics of the biotechnology industry will also be covered.

BIOT 102 Survey of Good Manufacturing Practices

3 Credits

Prerequisites: Program Chair Approval. Students will be introduced to the basics of manufacturing within the biotechnology industry, gaining an understanding of the work environment. Students will learn a brief history of the Food and Drug Administration, then will learn how the practices set forth by the FDA control the work environment and the behavior of workers in the field. This course prepares students for the most basic entry level position in this regulated industry.

BIOT 103 Safety and Regulatory Compliance for Biotechnology

3 Credits

Prerequisites: BIOL 107 or BIOL 121 or CHEM 101 or CHEM 105 or CHEM 111 or Program Advisor Approval. Overview of laboratory safety procedures and precautions, biosafety, radiation safety, compliance standards of regulatory agencies. Emphasis will be placed on understanding the regulatory environment of pharmaceutical, diagnostic and agricultural research and manufacturing. Students will be introduced to the agencies in the U.S. responsible for regulatory oversight of biotechnology. Concepts of current good laboratory practices (cGLP), current good manufacturing practices (cGMP), standard operating procedures (SOP) and validation will be addressed as they apply to industry.

BIOT 104 Quality Practices

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095; or ENGL 063 and ENGL 073, or ENGL 075; or FOUN 071; and MATH 023. Covers basic quality principles including quality audits and the statistics involved in analyzing and maintaining quality. Includes continuous and process improvement practices, as well as an understanding of customers and suppliers. Students will learn about the importance of teams and validation processes in quality. Corrective and preventative actions will be covered. Prepares students for ASQ Certified Quality Improvement Associate and Certified Quality Process Analyst exams, which can be taken upon obtaining an Associate degree.

BIOT 105 Survey of Regulatory Affairs

3 Credits

Prerequisite: Program Chair Approval. This course provides an entry level introduction to the laws and regulations that govern the development, marketing and commercial distribution of drugs, biological and medical device products and how they relate to the pharmaceutical, biotechnology and medical device industry. This course is intended to provide individuals with a greater understanding of regulatory affairs, specifically providing an understanding of how their actions are controlled by regulations and how to interact with FDA or global regulatory agencies.

BIOT 106 Introduction to Biotechnology Laboratory

1 Credit

Prerequisites: BIOT 100 and BIOL 105 or BIOL 121. Students will learn the most basic laboratory techniques in biotechnology. Lab safety, documentation, units of measurement, instrumentation, lab solutions, aseptic technique, establishing a pure culture, plasmid DNA isolation, restriction enzyme digestion, DNA agarose gel electrophoresis, PCR, DNA ligation and transformation of bacterial cells will be introduced during the course.

BIOT 107 Human Body Systems and Biomedical Interventions

4 Credits

Prerequisites: None. Presents a basic overview of biological molecules and their role in human body systems. This course emphasizes the current understanding of the role of DNA and RNA, and proteins at the cellular, tissue, and organ system level. The application of these subjects in the field of medicine, forensics, the environment, and biomedical engineering is emphasized. Scientific methods, project management, communications and research skills will be covered.

BIOT 110 Pharmaceutical Product Manufacturing

3 Credits

Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095; or ENGL 063 and ENGL 073, or ENGL 075; and Math 023; or FOUN 070 and FOUN 071. This course introduces the most fundamentals knowledge and skills required for the entry level jobs in pharmaceutical product manufacturing. It focuses on the topics related to how pharmaceutical products are formulated, filled in vials, lyophilized, labeled and packaged for distribution. Basic documentation, measurement, aseptic handling as well as the fundamentals of regulatory requirements will be discussed. With the successful completion of this course, students should be ready for entry level drug manufacturing jobs in pharmaceutical companies.

BIOT 117 Quality Control Techniques

3 Credits

Prerequisite: BIOT 101. Students will be introduced to those principles associated with quality control from a life sciences perspective. Students will learn about common microbial contaminants and how to prevent them. Students will also gain experience with common monitoring techniques used in the biotech industry.

BIOT 201 Cell Culture and Cellular Processes

4 Credits

Prerequisites: BIOT 101 and CHEM 105 or CHEM 111 or Program Advisor Approval. An introduction to major biochemical pathways, cellular structure and function at a molecular level. Topics to be considered include the structure and function of the cell membrane, cytoskeleton and various organelles. Cellular respiration will be discussed. Protein synthesis, processing and export will be examined. Those processes involved in cell division will also be investigated and related to cancer. The laboratory will center upon techniques involving animal, plant, fungi and bacterial cell cultures. Students will be taught how to isolate, culture and preserve prokaryotic organisms. Students will be taught how to maintain and preserve eukaryotic cell cultures. Students will learn to procure cell cultures from ATCC and other repositories. Includes lab.

BIOT 211 Analytic Methods in Biotechnology I

3 Credits

Prerequisites: BIOT 101 and CHEM 105 or CHEM 111. Theory and application of many analytical methods currently utilized in the field of biotechnology. These methods will include: ELISA and immunoaffinity techniques; methods for determining enzymatic activity; spectrophotometric methods; chromatographic methods; electrophoresis; light and electron microscopy. When feasible, techniques will be practiced in the laboratory setting. Methods utilizing radioactive isotopes will be discussed. Considerable emphasis will be placed on proper methods for data recording, analysis and presentation. Includes lab.

BIOT 212 Analytic Methods in Biotechnology II

3 Credits

Prerequisites: BIOT 211. Theory and application of many analytical methods utilized in the field of biotechnology. These methods will include: centrifugation, light and electron microscopy, restriction endonuclease digestion, agar and acrylamide electrophoresis of nucleic acids, Southern and Northern blotting, polymerase chain reaction and bioassays. When feasible, techniques will be practiced in the laboratory setting. Methods utilizing radioactive isotopes will be discussed. Considerable emphasis will be placed on proper methods for data recording, analysis and presentation. Includes lab.

BIOT 214 Food and Drug Law

3 Credits

Prerequisite: BIOT 101 or Program Advisor Approval. This course provides a basic introduction to the laws and regulations that govern the development, marketing and commercial distribution of drugs, biological and medical device products and how they relate to the pharmaceutical, biotechnology and medical devices industry. This course is designed to provide students with an overall landscape of U.S. and International laws regulating the drug, biotechnology and medical device industry.

BIOT 215 Clinical Trials

3 Credits

Prerequisites: ENGL 111, BIOT 214, or Program Advisor Approval. This course provides a basic introduction to clinical trial process to include: governing regulations and standards, design, conduct, records and documentation. The course also covers medicinal product development process and the role of clinical trials in that process.

BIOT 216 Risk Management for Drugs and Medical Devices

3 Credits

Prerequisite: BIOT 101 or Program Advisor Approval. This course provides a basic introduction to risk management strategy application of best practices and risk management for both the drug and medical device industry. This course is designed to provide students with an overall understanding of this growing discipline to improve patient safety and the regulatory mandates and laws.

BIOT 217 Biotechnology Manufacturing Processes **3 Credits**

Prerequisites: Program Advisor Approval. Introduction to processes and procedures involved in manufacture of biological molecules on both large- and small-scales. Students will learn function of commonly used manufacturing equipment associated with biotechnology and understand the cGMP's associated with use of such equipment. The regulatory environment associated with most biotechnology endeavors will be reviewed including those mandated by FDA, USDA and OSHA.

BIOT 218 Medicinal Product Lifecycle and Capstone Project **3 Credits**

Prerequisites: BIOT 214, BIOT 215, and BIOT 216, or Program Advisor Approval. Medicinal Product Life Cycle and Capstone Project is the last of a suite of four Regulatory Affairs courses that have been designed to teach the skills and knowledge required by medicinal product and biotechnology industries. The first four weeks of this course will provide a basic introduction to medicinal product lifecycle, and the last 12 weeks will be focused on completing one of three possible capstone projects (student's choice with instructor guidance) that will incorporate skills and knowledge acquired from the three previous RA courses and the first 4 weeks of this course.

BIOT 220 Molecular Biology Lectures **3 Credits**

Prerequisites: BIOL 107 or BIOL 121 and CHEM 106. Introduces DNA, RNA and proteins and review their structures and functions, including their physical and chemical properties and their roles in cellular metabolism. The course will include an in-depth look at the synthesis of these molecules, as well as DNA replication, transcription and translation.

BIOT 221 Microbiology **3 Credits**

Prerequisites: BIOL 121 and CHEM 106. Corequisites: BIOT 222. Presents an overview of microbiology including fundamental structures of microorganisms, their growth, metabolism, interaction with other living things, and classification. Emphasis placed on industrial applications of microbiology.

BIOT 222 Microbiology Laboratory **2 Credits**

Prerequisites: BIOL 121 and CHEM 106. Corequisites: BIOT 221. A conventional laboratory of exercises, demonstrations and discussions. Laboratory exercises are designed to enable students to achieve proficiency in the principles and techniques necessary for cultivation of microorganisms using aseptic techniques and for performing and interpreting biochemical tests. The laboratory exercises will be filled out weekly and turned in to be graded.

BIOT 227 Genetic Engineering and DNA Analysis **4 Credits**

Prerequisites: BIOT 201 or BIOT 211. The essential concepts and techniques in genetic engineering. Students will practice essential gene cloning procedures: isolation of DNA, restriction endonuclease digestion, agarose gel electrophoresis analysis, DNA ligation, and transformation into a host strain. Other essential techniques such as PCR, construction and screening of genomic or cDNA libraries, Southern and Northern blot analyses will be practiced. Students will understand the principles and ethical issues of animal or human cloning practices. Current methods for transfer and propagation of genes into plants and animals will be discussed. Various gene knockout techniques such as homologous gene recombination, site-directed mutagenesis, and RNAi will be introduced. Topics in genomics, proteomics, and bioinformatics will be discussed. Includes lab.

BIOT 231 Industrial Processes and Fermentation **4 Credits**

Prerequisites: BIOT 201. An introduction to fermentation processes used for commercial purposes and the operation of small- and large-scale fermentors. Methods used to harvest product from fermentors and the regulatory requirements associated with commercial fermentation will also be explored. Includes lab.

BIOT 233 Protein Analysis and Purification **4 Credits**

Prerequisites: BIOT 212. Students will review the biochemical properties of amino acids and proteins, then study techniques of cell disintegration and extraction, protein separation, and analysis. Students will be taught to determine which method is most applicable in various situations and why that method should be utilized. When possible, students will be given an opportunity to perform these techniques in the laboratory. Includes lab.

BIOT 235 Biotechnology Laboratory **3 Credits**

Prerequisites: BIOL 107 and CHEM 105. Corequisites: BIOL 221. Presents overview of basic biotechnology laboratory skills emphasizing chromatography techniques, methods of DNA and protein electrophoresis, processes of immunoassays, data management skills, recombinant DNA technology, and the polymerase chain reaction.

BIOT 237 Plant Tissue Culture **4 Credits**

Prerequisites: BIOT 201 and CHEM 106. The student will be introduced to basic techniques of plant tissue culture. This is the aseptic culture of plant cells, tissues, organs and plants. This course seeks to familiarize students with the basic principles of tissue culture and to expose them to their many applications. The course includes media preparation, isolation of explants, and establishment of callus from suspension cultures, growth factor bioassays, and regeneration of whole plants from tissue and plant and genetic engineering techniques. We will also discuss the theory, production and societal implications of transgenic plants.

BIOT 239 Biomaterials and Tissue Engineering **4 Credits**

Prerequisites: BIOT 201. The student will be introduced to biomaterial and tissue functionality and design including the basic concepts underlying physiological responses to wounds and foreign materials. Topics to be considered include biomaterial scaffolds, relevant cell types, soluble regulators or their genes, and mechanical loading and culture conditions. Comparisons will be made between differentiated cell types and stem cells as well as natural and synthetic scaffolds. Methodology for the preparation of cells and scaffolds in practice is described. The rationale for employing growth factors is covered and the techniques for gene modification for optimizing matrix interactions are discussed. Methods for fabricating tissue-engineered products and devices for implantation are taught including material selection and processing, mechanisms of material degradation, cell-material interactions and interfaces, matrix structure transport issues. Examples of tissue engineering –based procedures currently employed clinically are analyzed as case studies. Students will gain experience with biomaterial design and modification in addition to cell culture with these matrices.

BIOT 241 Immunology and Immunological Processes **4 Credits**

Prerequisites: BIOT 211. A brief survey of the components of the immune system and how they interact. The topics covered will include, B and T cell development, activation and culture, the role of cytokines, their production and purification, signal transduction processes in B-cell activation, the role of MHC complexes, immunoglobulin synthesis and origins of diversity, antigen-antibody interactions, practical aspects of raising and purifying polyclonal and monoclonal antibodies, handling and labeling of antibodies, applications of antibodies including Western blotting, ELISA, and immunohistochemistry. Includes lab.

BIOT 279 Capstone in Biotechnology **3 Credits**

Prerequisites: Program Chair Approval. This course will evaluate the student's level of understanding of those core skills and concepts of the biotechnology program in which the student is preparing to graduate. Career paths that are now open to graduates will be explored. The emerging economic role of biotechnology in economic development and consequent ethical issues will be examined. Guidance in professional presence and job expectations will also be provided.

BIOT 280 Co-op/Internship **2-6 Credits**

Prerequisites: Program Advisor Approval. Provides students with the opportunity to work at a job site that is specifically related to their career objectives. Provides on-the-job experience while earning credit toward an associate degree.

BIOT 281 Independent Research and Development **1-3 Credits**

Prerequisites/Corequisites: BIOT 227, BIOT 231, BIOT 233, BIOT 237, or Program Chair Approval. Students will work under the supervision of faculty to conduct independent research and/or development projects. These projects will lead to demonstrable outcomes.

BOAT 009 Introduction to Keyboarding **3 Credits**

Prerequisites: None. Introduces the use of the keyboard. Touch-typing skills, manual dexterity, and speed development are cultivated using computers.

BOAT 019 Keyboarding **3 Credits**

Prerequisites: None. Provides students with the fundamentals of keyboarding using the touch method. Emphasizes mastery of the keyboard, development of formatting skills, and development of speed and accuracy on a personal computer using an up-to-date software package.

BOAT 101 Microsoft Outlook **3 Credits**

Prerequisites: None. Provides students with the ability to utilize email components. Topics include managing schedules, managing folders and contacts, organizing work using tasks and notes, and customizing and using advanced email features. Students are required to demonstrate course objectives through the appropriate Microsoft certification examination.

BOAT 105 Microsoft Word **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Introduces the concepts of word processing systems. Offers hands-on experience in the operation of Microsoft Word. Students are required to demonstrate course objectives through the appropriate Microsoft certification examination.

BOAT 109 Microsoft PowerPoint **3 Credits**

Prerequisites: None. Provides students hands-on experience creating complex slide shows utilized for business applications. Integration of other software applications with Microsoft PowerPoint will be addressed. Students are required to demonstrate course objectives through the appropriate Microsoft certification examination.

BOAT 113 Medical Coding **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Addresses current basic CPT coding concept guidelines including learning to use documented information and current basic ICD- coding guidelines including how to extract information from medical charts.

BOAT 114 Microsoft Publisher **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095. Emphasizes the production of publication-quality documents. Attention is given to design and layout principles and production techniques. Fonts, graphics, and page composition are integrated into camera-ready documents using Microsoft Publisher.

BOAT 121 Office Procedures and Team Dynamics **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095. Prepares the student to understand and carry out responsibilities assigned in a business office. Topics include telephone techniques, office equipment, travel and conference arrangements, professional development, research techniques, time and stress management, and business ethics.

BOAT 130 Quality and Customer Service **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Examines and addresses issues of quality and customer service faced by organizations. Explores evolving philosophies, definition, development, and application. Includes examination of current applications in administration.

BOAT 201 Emerging Technologies **3 Credits**

Prerequisites: BOAT 121. Digital literacy has become increasingly important to the business environment. Technological advances provide opportunities for businesses to survey inclusion of new innovations. This course discusses, identifies, researches, and applies emerging technologies. Discussing new technology and understanding the importance of updating skills is necessary for today's business operations.

BOAT 207 Integrated Microsoft Office Applications **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095 and MATH 023 or higher. Emphasizes the identification and practice of the appropriate use of technology to communicate and solve business problems and aid in decision making. Focuses primary attention to developing business problem-solving skills and decision-making skills using Microsoft Access and Excel. Also explores the advanced integration features associated with Microsoft Word and PowerPoint.

BOAT 213 Advanced Medical Coding **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Addresses advanced current CPT coding concept guidelines including learning to use documented information and advanced current ICD guidelines including how to extract information from medical charts. Emphasis is given to surgical coding in the course.

BOAT 216 Business Communications **3 Credits**

Prerequisites: ENGL 111. Emphasizes analysis of business communication environments—cultural, organizational, technological, international, and interpersonal—and the use of communications standards to direct the choice of oral and written communication methods and techniques. It includes practice in writing a variety of messages used to communicate in business and industry with an emphasis on the potential impact of the message on the receiver as a basis for planning and delivering effective business communications.

BOAT 218 Microsoft Excel **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or a grade of "C" or better in MATH 023 or higher. Provides an in-depth understanding of worksheet design, charting, what-if analysis, worksheet database creation and manipulation, and OLE using Microsoft Excel. Knowledge and use of a spreadsheet will be applied to various business applications. Integration of spreadsheets in other applications will be addressed. Students are required to demonstrate course objectives through the appropriate Microsoft certification examination.

BOAT 221 Organizational Leadership **3 Credits**

Prerequisites: BOAT 121. Emphasizes leadership functions in an office environment. Key topics include human resources, team building, ergonomics, project management, and leadership styles. Case studies and leadership projects are included to illustrate challenges organizational leaders face.

BOAT 222 Microsoft Access **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095, MATH 023 and MATH 080 or higher. Provides "hands-on" experience and familiarizes students with the creation and management of a Microsoft Access database. Uses Access database software to create, modify, query, and report information from a database. Integration of other software applications with Access will be addressed as well. Students are required to demonstrate course objectives through the appropriate Microsoft certification examination.

BOAT 226 Advanced Microsoft Excel **3 Credits**

Prerequisites: BOAT 218. Continues the study of electronic spreadsheets in business. Emphasizes the advanced application of electronic spreadsheets. Students are required to demonstrate course objectives through the appropriate Microsoft certification examination.

BOAT 280 Co-op/Internship/Externship **3 Credits**

Prerequisites: Program Advisor Approval. Provides students with the opportunity to work for an organization that is specifically related to their career objectives. Provides on-the-job experience while earning credit.

BOAT 281-294 Special Topics **3 Credits**

Prerequisites: Program Advisor Approval. Discusses topics of current interest in office administration. Identifies and offers various special topics during each term under this course number.

BUSI 279 School of Business Evaluation and Professional Development **2 Credits**

Prerequisites: Program Advisor Approval. Prepares the student for entry into their respective field of business. Reviews procedures for interviewing, resume writing, job search techniques, team participation, ethics, and productive job performance. Students will also take the college's Collegiate Assessment of Academic Proficiency (CAAP) tests and the appropriate program Technical Outcome Assessment.

BUSN 101 Introduction to Business **TransferIN 3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Examines the American business system in relation to the economic society. Studies business ownership, organization principles and problems, management, control facilities, administration, and development practices of American business enterprises.

BUSN 105 Principles of Management **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Describes the functions of managers, including the management of activities and personnel. Focuses on application of guidance principles in management.

BUSN 106 Customer Service **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Course focuses on the importance of providing superior customer service to the organization as well as the customer service representative. Fundamental customer service techniques applicable to a variety of situations are presented.

BUSN 108 Personal Finance **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095 and MATH 023 or higher. Corequisite: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in Math 023 or higher. Emphasizes management of individual financial resources for growth and maintenance of personal wealth. Covers home buying and mortgage financing, installment financing, life and health insurance, securities, commodities and other investment opportunities.

BUSN 115 Crisis Management **3 Credits**

Prerequisites: None. Explores how to manage business crises, how best to avoid them, and what managers can learn from the experience.

BUSN 120 Business Ethics and Social Responsibility **3 Credits**

Prerequisites: BUSN 101. An examination of individual, organizational and societal ethical issues and the social responsibility of business organizations in the resolution of these issues. Critical thinking and informed decision making are emphasized.

BUSN 125 Conference Facilitation **3 Credits**

Prerequisites: None. Stresses the importance of the conference in business and industry. Emphasizes the practical application of the various techniques of conference leadership and an understanding of group dynamics in the conference setting.

BUSN 130 Principles of Banking **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095 and MATH 023 or higher. Corequisite: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or higher. Discussion ranges from fundamentals of negotiable instruments to contemporary issues and developments within the industry.

BUSN 132 Consumer Lending **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095 and MATH 023 or higher. Corequisite: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or higher. Presents an insider's view of consumer lending, offering essential information about the maze of regulations that govern credit practices, and reviews loan processing, cross selling and collections.

BUSN 140 Health Care Systems and Trends **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. An introduction to the health care industry emphasizing the systems approach to health care and the current trends facing the industry. Gives special attention to managed care organizations.

BUSN 158 Introduction to Sport Management **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093 or ENGL 095 and MATH 023 or higher. Corequisite: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or higher. This course will focus on the nature and scope of sport management. Students will examine the breadth of sport related careers as well as engage in critical thinking about current sport management issues and trends.

BUSN 160 Introduction to Insurance

3 Credits

Prerequisites: None. Presents an introduction to the profession of insurance. The course includes an overview of the insurance industry, types of coverage that exist, insurance processes and expected outcomes.

BUSN 165 Techniques of Supervision

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Introduces basic employee development with emphasis on the responsibilities of a newly-appointed supervisor. Emphasizes organizational structure, motivation, delegation of authority, interviews, orientation and induction of new employees, employee performance evaluations and dealing with employee conflict.

BUSN 201 Business Law

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Describes the judicial system and the nature and sources of law affecting business. Studies contracts, sales contracts with emphasis on Uniform Commercial Code Applications, remedies for breach of contract and tort liabilities. Examines legal aspects of property ownership, structures of business ownership, and agency relationships.

BUSN 202 Human Resource Management

3 Credits

Prerequisites: BUSN 105. Focuses on the activities of human resource management, with emphasis on employer-employee relations, job analysis and evaluation, salary administration, work measurement and standards, performance appraisal and legal compliance.

BUSN 203 Business Development

3 Credits

Prerequisites: BUSN 105, MKTG 101 and ACCT 102. Explores business operations for the self-employed or as a manager of a small business enterprise. The course includes: covering the role of entrepreneur and manager; selecting the appropriate business organization; developing plans and strategies for small, medium, and growing firms; securing financing for start-up and growing operations; exploring growth opportunities; and successfully managing human and material resources.

BUSN 204 Case Problems in Business

3 Credits

Prerequisites: BUSN 105, MKTG 10, and ACCT 102. Corequisite: ACCT 102. Applies business concepts and principles to specific case studies or problems.

BUSN 207 Introduction to International Business

3 Credits

Prerequisites: BUSN 101. Provides an overview of the international environment in which business operates today. Demonstrates the global relationships between business activities and how events in one part of the world can influence business decisions and activities in other parts of the world.

BUSN 208 Organizational Behavior

3 Credits

Prerequisites: BUSN 105. Studies human behavior in organizations at the individual and group level, including the effects of organizational structure on behavior. Focuses on using organizational behavior concepts for developing and improving interpersonal skills.

BUSN 209 Introduction to e-Business

3 Credits

Prerequisites: BUSN 101. Focuses on how e-commerce is conducted and managed, its major opportunities, limitations, issues and risks. E-commerce applications to be discussed include those of business-to-consumer (B2C), business to business (B2B), and intra business. Because e-commerce is interdisciplinary, subject matter will be directed at managers, professionals, and students who wish an overview of the e-commerce sector.

BUSN 210 Managerial Finance

3 Credits

Prerequisites: ACCT 101 and BUSN 101. An introductory course in the principles of financial management. Develops decision-making skills related to the financial resources of a firm. Includes techniques of financial analysis, time value of money, capital budgeting, risk and return.

BUSN 211 Investment

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095 and MATH 023 or higher. Corequisite: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or higher. An introduction to the fundamentals of investing. Presents the basis of investing, with attention to the various ways in which investment vehicles operate.

BUSN 212 Principles of Leadership

3 Credits

Prerequisites: BUSN 105. Introduction and overview of fundamental concepts of effective leadership in formal organizations.

BUSN 213 Management in Non-Profit Organization

3 Credits

Prerequisites: BUSN 105 or Advisor Approval. This course is designed to introduce the student to the purpose and function of non-profit organizations. Students will apply planning, organization, leadership and control techniques as they apply to the non-profit sector.

BUSN 221 Principles of Employment

3 Credits

Prerequisites: BUSN 202. Emphasizes the employment process with an in-depth look at linking business strategies with strategic hiring practices, including forecasting, planning, recruiting, measuring, and selecting internal and external candidates in a legal context. Topics also include methods of designing job analyses and descriptions, orientation, retention, turnover, and termination.

BUSN 222 Benefits Administration

3 Credits

Prerequisites: BUSN 202. Provides an in-depth look at benefit administration. Topics include vacations, holiday pay, insurance, retirement programs and other employee inducements. Emphasis will be placed on cost of benefits in relationship to the overall compensation package. The course will also look at the relevance of reward and recognition and pay structures.

BUSN 223 Occupational Safety and Health

3 Credits

Prerequisites: BUSN 105. A look at the importance of safety and health in the workplace. The Occupational Safety and Health Act of 1970 will be examined in depth with relationship to businesses and their employees. Emphasis will be placed on effective practices, costs, labor and management responsibilities, health hazards, alcohol and drug abuse, worker's compensation, physical conditions and training.

BUSN 228 Principles of Purchasing

3 Credits

Prerequisites: BUSN 101. Designed to teach the basics of purchasing management. Topics covered include: the challenge of purchasing and materials management, objectives and organization, function, specification, quality control and inspection, supplier evaluation, selection, and measurement, supplier development, strategic cost management, contracts and negotiation, purchasing relationships, purchasing transportation, purchasing laws and ethics, and global sourcing.

BUSN 230 Business Statistics

3 Credits

Prerequisites: BUSN 101 and MATH 100 or higher. Designed to build student competence in the areas of descriptive and inferential statistics, through emphasis on the application of these statistical methods. Includes an examination of data, probability of occurrence, and basic sampling processes. Uses statistical methods to model results and uses these models for forecasting. Tests to examine the appropriateness of these techniques are introduced.

BUSN 240 Organizational Development in Health Care

3 Credits

Prerequisites: BUSN 105 and BUSN 140. Examines organizational structure in health care organizations, including traditional structures and re-engineering of the health care industry. Covers staff development, training, job analysis and design, and departmental staffing. Discusses medical ethics.

BUSN 242 International Business Management

3 Credits

Prerequisites: BUSN 207. The course provides an overview of the general global business management principles including international business planning process, differences in ethical and cultural practices across the world. Explains principles of country risk assessment and management including political, legal and economic risks and explains general budgeting principles of global business.

BUSN 243 International Business Marketing

3 Credits

Prerequisites: BUSN 207. The course provides an overview of principles of developing and implementing global marketing strategies and plans, including competitive analysis, political, legal, cultural and technological issues. Discusses basic research techniques, explains budgeting, pricing, sourcing concerns and explains sales and profit forecasting techniques.

BUSN 244 International Supply Chain Management

3 Credits

Prerequisites: BUSN 207. The course provides an overview of the importance of transportation costs, trade agreements, duties, taxes and security issues and their impact on international business plans. It explains how to evaluate potential intermediaries, import and export documentation, regulatory requirements and country of origin determination.

BUSN 245 Global Business Finance

3 Credits

Prerequisites: BUSN 207. The course provides an overview of political, legal, cultural issues pertaining to payment terms, risks associated with getting on time payments, and cancellation of contracts. Evaluates foreign currency exchange risks; explains risk managements techniques; methodologies available to research credit history and payment capacity of potential buyers and discusses short and long term financing options for the overseas buyer.

BUSN 258 Sport in Society

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course has been designed to introduce the socio-cultural dimensions of sport. Sport is sometimes trivialized as a playground off to the side of the real world. This course will describe to the student that sport is a microcosm of society as well as a site for changing society. Finally, the course will show that sport has a profound influence on the social life of large numbers of people of all ages.

BUSN 260 Property and Liability Insurance Principles

3 Credits

Prerequisites: BUSN 160. Provides an overview of the insurance business and an understanding of the basic principles of property and liability insurance.

- BUSN 262 Personal Insurance** **3 Credits**
Prerequisites: BUSN 260 or Advisor Approval. Analyzes personal loss exposures and insurance including homeowners and other dwelling coverages, personal liability, inland marine, auto, life, health insurance, and financial planning.
- BUSN 264 Commercial Insurance** **3 Credits**
Prerequisites: BUSN 160. Explores commercial coverage's and loss exposures including property, business income, marine, crime, boiler and machinery, general liability, auto, workers compensation, business owners, miscellaneous coverages, and surety bonding.
- BUSN 265 Labor Relations** **3 Credits**
Prerequisites: BUSN 101 and BUSN 202. This is a second-year elective course in labor-management relations. The course examines labor history, major labor legislation, collective bargaining, grievance procedure/arbitration, wage issues and economic supplements e.g. "fringe benefits." Students will obtain the knowledge and skills necessary for functioning effectively in an organized – particularly an industrial – environment.
- BUSN 267 Operations Management** **3 Credits**
Prerequisites: MATH 100 or higher. Operations Management is a study of the efficient production of goods and services that will satisfy the wants and needs of identified customer groups. The course begins with a more detailed description of what Operations Management is, then moves to an examination of the customer and methods for determining customer demand.
- BUSN 271 Lessons in Leadership** **3 Credits**
Prerequisite: BUSN 105. Leadership styles and strategies of historical leaders and/or modern day leaders are analyzed and applied to 21st century business scenarios. Modern management theories are discussed in relationship to actual events in historical events to legitimize the theories in a practical application.
- BUSN 279 Capstone Course** **2 Credits**
Prerequisites: Program Advisor Approval. Prepares the student for entry into the field of business. Reviews the procedures for conducting a job search, resume and cover letter writing, interviewing, and follow-up communications. Provides for taking program outcomes assessments.
- BUSN 280 Co-op/Internship** **1-3 Credits**
Prerequisites: Program Advisor Approval. Gives students the opportunity to work at a job site that is specifically related to their career objectives. Provides on-the-job experience while earning credit toward an associate degree.
- BUSN 281 – 294 Special Topics** **1-3 Credits**
Prerequisites: Program Advisor Approval. Discusses topics of current interest in business. Identifies and offers various special topics during each term under this course number.
- CARD 205 Introduction to Electrocardiography** **3 Credits**
Prerequisites: HLHS 101, APHY 101. Corequisites: APHY 102. This course presents the rationale for obtaining an electrocardiogram as well as related theory including anatomy and physiology, procedural technique and equipment utilized. Students will be introduced to basic rhythm analysis including recognizing standard electrical waves and accurately measuring each normal sinus rhythm and basic arrhythmias.
- CARD 206 Advanced Electrocardiograph Technique** **3 Credits**
Prerequisites: CARD 205. Discusses related anatomy and physiology of the cardiovascular system, identification of cardiac arrhythmias, their rhythm strip appearance and common treatment modalities. Also includes event and Holter monitoring.
- CARD 208 ECG Experiential Seminar** **3 Credits**
Prerequisite: Program Advisor Approval. Provides opportunities to observe, perform, and discuss various ECG related procedures and competencies under supervision in lab and/or clinical settings.
- CATX 101 Physical Principles, Clinical Applications and Quality Control I** **3 Credits**
Prerequisite: Advisor Approval. Provides comprehensive coverage of the physical principles of Computed Tomography (CT) and how it relates to the clinical applications for both adults and children. This class introduces the foundation for the practice of CT scanning. This class will also cover radiation dose and quality control.
- CATX 102 Cross Sectional Anatomy I** **3 Credits**
Prerequisite: Advisor Approval. Introduces the student to cross sectional anatomy. Covers the terminology related to sectional anatomy. Discusses different planes of the body and associate them with the quality of images that will be encountered in clinical practice. Covers the difference between all post processing options. Covers anatomy in cross sectional plane and all structures and functions pertaining to the related anatomy. Discusses common pathologies related to the anatomy presented.

CATX 103 CT Clinical Education I

2 Credits

Prerequisites: Advisor Approval. Through various clinical sites the student will acquire competency in the field of computed tomography. During the clinical rotation, the student is required to use the knowledge acquired in the cognitive domain to display appropriate behavior in the affective domain and to build skills in the psychomotor domain. This is accomplished by scanning actual patients under controlled conditions.

CATX 201 Physical Principles and Quality Control II

3 Credits

Prerequisite: CATX 101. This class will conclude on previous class the physical principles of Computed Tomography (CT) in regards to volume scanning (spiral/helical CT) and the fundamentals of volume scanning. Discusses advances in spiral CT and 3D CT and impact on patients.

CATX 202 Cross Sectional Anatomy II

3 Credits

Prerequisite: CATX 102. This class builds on the prior class and discusses 3D images in more depth. It will cover the difference between all post processing options. The class covers anatomy in the thorax, abdomen, pelvis and extremities as well as CT angiography in cross sectional plane and all structures and functions pertaining to the related anatomy. Discusses common pathologies related to the anatomy presented.

CATX 203 CT Clinical Education II

2 Credits

Prerequisites: Acceptance into CT program. This is the second of two rotations through either one or various clinical sites to allow the student to acquire competency in the field of computed tomography. During the clinical rotations the student is required to use the knowledge acquired in the cognitive domain to display appropriate behavior in the affective domain and to build skills in the psychomotor domain. This is accomplished by scanning actual patients under controlled conditions.

CHEM 061 Basic Chemistry

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and MATH 015 or MATH 023. Provides students with an introduction to chemistry basics. Provides instruction for students with little or no recent chemistry background, especially those desiring to continue in more advanced chemistry courses or other science courses. Includes lab.

CHEM 101 Introductory Chemistry I

Transfer IN 3 Credits

Prerequisites: MATH 118 or MATH 123 or demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 100 or MATH 122, and ENGL 093 and ENGL 083 or ENGL 095. An introductory course that includes the science of chemistry and measurement, atomic theory and the periodic table, chemical bonding, equation writing and balancing, stoichiometry, gases and acids/bases. Includes lab.

CHEM 102 Introductory Chemistry II

3 Credits

Prerequisites: CHEM 101. Includes liquids and solids, solutions and solution concentrations, acids and bases, equilibrium, nuclear chemistry, and organic and biochemistry. Includes lab.

CHEM 105 General Chemistry I

Transfer IN 5 Credits

Prerequisites: MATH 136 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. The first in a series of two courses designed to cover general chemistry including measurement, atoms, molecules and ions, stoichiometry, chemical reactions, solids, liquids, and gases thermochemistry, atomic structure, and molecular bonding. One year of high school chemistry or one semester of college introductory chemistry is recommended. Includes lab. ***Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.***

CHEM 106 AH General Chemistry II

5 Credits

Prerequisites: CHEM 105 General Chemistry I and admission into the American Honors Program. The second in a series of two introductory courses designed to cover general chemistry including kinetics, equilibria, acid/ base chemistry, thermodynamics, electrochemistry, nuclear chemistry, organic chemistry and descriptive inorganic chemistry. Includes lab.

CHEM 111 Chemistry I

4 Credits

Prerequisites: MATH 123 or demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 035 or MATH 043 or MATH 100 and ENGL 093 and ENGL 083 or ENGL 095. An introductory course that includes the science of chemistry and measurement, atomic theory and the periodic table, chemical bonding, stoichiometry, liquids and solids, gases and the ideal gas law, solutions, and acids and bases. Includes lab.

CHEM 112 Chemistry II

4 Credits

Prerequisites: CHEM 111 or CHEM 101. Explores concepts of equilibrium. Includes chemistry of metals and nonmetals, environmental chemistry, nuclear chemistry, organic and biochemistry. Includes lab.

CHEM 115 General, Organic, and Biological Chemistry

4 Credits

Prerequisites: MATH 023 or MATH 080 and ENGL 093 and ENGL 083 or ENGL 095. The basic principles of general, organic, and biochemistry will be discussed. This will include measurement, nomenclature, chemical reactions, stoichiometry, gases, acids-bases, solutions, radioactivity, proteins, nucleic acids, carbohydrates, and metabolism. Includes lab.

CHEM 204 Lectures in Organic Chemistry**3 Credits**

Prerequisites: CHEM 102, CHEM 105 or CHEM 112. A one-semester survey course designed to introduce organic chemistry including nomenclature, spectroscopy, stereochemistry, reactions, and mechanisms.

CHEM 211 Organic Chemistry I**5 Credits**

Prerequisites: CHEM 106. The first in a series of two courses designed to cover organic chemistry including the properties, syntheses, and reactivity of aliphatic and aromatic compounds. The course includes an introduction to organic chemistry lab techniques covering the synthesis, purification, and characterization of organic compounds. Includes lab.

CHEM 212 Organic Chemistry II**5 Credits**

Prerequisites: CHEM 211. The second in a series of two courses designed to cover an understanding of organic chemistry including the properties, syntheses, and reactivity of aliphatic and aromatic compounds, polyfunctional natural products such as carbohydrates, and peptides. The course includes various organic chemistry lab techniques covering the synthesis, purification, and characterization of organic compounds. Includes lab.

CHEM 215 Quantitative Chemical Analysis**3 Credits**

Prerequisites: CHEM 106. Lecture and intensive laboratory that focuses on quantitative chemical analysis. This course will include how to take accurate and precise measurements, perform proper calibration, and then use the proper statistics needed to analysis the data. Specific topics will include gravimetric analysis, several types of titrations including: solubility, acid/base, and reduction-oxidation, and the fundamentals of electrochemistry.

CHEM 279 Introduction to Scientific Research**3 Credits**

Prerequisites: CHEM 215 and Program Chair Approval. Students will be introduced to those principles associated with scientific research. The course will be tailored to individually expose each student to research associated with their discipline or sub-discipline. Students will be instructed on basic research principles, develop a testable hypothesis, design a research project that tests their hypothesis, and present their findings in both written and presentation form. Written form will follow the format of an international journal that represents the student's discipline. Presentations can be either poster or oral, and should reflect the discipline standard.

CHIN 101 Mandarin Chinese Level I**4 Credits**

Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course is designed for students who have very little or no prior experience in Mandarin Chinese language studies. Students will gain elementary listening, speaking, reading and writing skills using both the Pinyin phonetic system and Simplified Mandarin Chinese characters. Students will build their Mandarin Chinese language skills through the use of essential real-life topics, and an introduction to Mandarin Chinese social and cultural themes.

CHIN 102 Mandarin Chinese Level II**4 Credits**

Prerequisites: CHIN 101 or demonstrated competency in Mandarin Chinese through appropriate assessment; demonstrated competency in reading and writing through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. Continues the study of Mandarin Chinese for students who have had the equivalent of one semester of college-level Mandarin Chinese. Introduces additional grammatical structures and vocabulary to further develop speaking, reading, writing and listening skills as well as an appreciation of the cultures of the Mandarin Chinese-speaking world.

CHMT 101 Laboratory Safety and Techniques**3 Credits**

Prerequisites: None. Introductory course dealing with basic skills needed in the industrial laboratory such as basic lab safety, identification, care and operation of basic laboratory equipment including pH meters, glassware, and definition and preparation of reagents. Includes laboratory exercises in the use of selected equipment.

CHMT 102 Scientific Computing and Data Analysis**3 Credits**

Prerequisites: None. A course designed to expose students to the computational tools utilized by scientists in data analysis and presentations.

CHMT 170 Success in Science**1 Credit**

Prerequisites: None. Introductory course covers basics of the chemical process industry including career paths, business components and ethical standards. Scientific literature searches and safety issues are discussed.

CHMT 201 Spectroscopic Methods**4 Credits**

Prerequisites: CHMT 101 and CHEM 101. Addresses theoretical aspects of industrial laboratory instrumentation, including inductively coupled plasma (ICP), UV-Visible spectrophotometry and fluorometry, infra-red (IR) spectrophotometry and atomic absorption (AA). Presents theories and laws that govern the way instruments operate. Includes student experimentation on various analytical instruments.

CHMT 202 Chromatographic Methods **4 Credits**

Prerequisites: CHMT 201. Continues the theoretical study of CHMT 201 by addressing industrial applications of laboratory instrumentation, including gas and liquid chromatography (GC and LC), high performance liquid chromatography (HPLC). Presents automation techniques, including sampling, data collection and analysis. Covers the laws that govern the way instruments operate. Includes student experimentation on various analytical instruments.

CHMT 204 Scientific Presentation and Reporting **3 Credits**

Prerequisites: Program Advisor Approval. Focuses on solving problems in chemical technology settings including the analysis of the problem, generation of creative solutions and effective presentation of proposed solutions. Includes lab.

CHMT 207 Food, Drugs and Polymers **3 Credits**

Prerequisites: CHEM 102 and CHMT 101. A survey course designed for advanced students, this course covers the basics of Food Science, Polymer Science and Pharmaceuticals. Includes lab.

CHMT 210 Quantitative Analysis **3 Credits**

Prerequisites: CHEM 101 and CHEM 102. Investigates techniques for quantitative analysis of samples including their applications in industrial settings. Includes techniques such as gravimetric analysis, neutralization, oxidation-reduction titrations, potentiometric measurements and complexing titrations. Includes lab.

CHMT 216 Organic Laboratory Techniques **3 Credits**

Prerequisites: CHEM 204. A laboratory course that focuses on basic organic laboratory techniques, spectroscopy, and synthesis.

CHMT 250 Environmental Chemistry **3 Credits**

Prerequisites: Program Advisor Approval. A lecture course that describes natural systems and their pollutants in terms of their chemical components.

CHMT 270 Professional Development **1 Credit**

Prerequisites: CHMT 101. Designed to be taken the semester before students begin looking for a job. Its purpose is to help students with the professional skills required in scientific industries.

CHMT 280 Internship **3 Credits**

Prerequisites: Program Advisor Approval. Students work at a job site that is specifically related to his/her career objectives. Provides extensive job experience while earning credit towards an associate degree. Students will also participate in a once a week seminar.

CIMG 102 Introduction to Robotics **3 Credits**

Prerequisites: None. Corequisite: INDT 100. Introduces students to robotics and automated systems and their operating characteristics. Covers robotics principles of operation and work envelopes. Teaches coordinate systems and how hydraulic, pneumatic and electromechanical systems function together. Covers servo and non-servo controls, system capabilities and limitations and safety.

CIMG 202 Work Cell Design and Integration **3 Credits**

Prerequisites: CIMG 102. An advanced course which provides instruction in selecting equipment, writing specifications, designing fixtures and interconnects, integrating systems, providing interfaces and making the assigned systems operational.

CIMG 203 Automation Electronics **3 Credits**

Prerequisites: INDT 205. Interface Programmable Controllers (PLC's) with analog I/O devices. Tune Proportional Integral Derivative (PID) loops. Analyze 4 -20 mA current circuitry of a thermal process. Achieve process control with PLC analog input/output controls using a human machine interface. Program on-line and off-line via PLC networking.

CIMG 205 Automated Manufacturing Systems **3 Credits**

Prerequisites: CIMG 202 and CIMG 203. Covers basic principles and applications for planning and controlling production operations and improvement programs. Includes system characteristics and solutions for production process and service operation problems; methods analysis; cost estimating; facilities planning, tooling and services acquisition and maintenance; production, project and program scheduling; materials and inventory management; safety and loss prevention; decision-making tools and evaluation of alternatives.

CINS 074 Computer Literacy **3 Credits**

Prerequisites: None. Provides a general survey of computer basics. Includes the survey and analysis of microcomputer components, compares and contrasts computer applications, investigates software options, expose students to hardware peripherals and introduces students to Windows and office applications.

CINS 101 Introduction to Microcomputers **Transfer IN 3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENG 083 and ENGL 093, or ENGL 095. Introduces the physical components and operation of microcomputers. Focuses on computer literacy and provides hands-on training in four areas of microcomputer application software: word processing, electronic spreadsheets, database management and presentation software. Use of a professional business integrated applications package is emphasized.

COMM 101 Fundamentals of Public Speaking

Transfer IN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in: ENGL 093 and ENGL 083 or ENGL 095 or FOUN 071. Introduces fundamental concepts and skills for effective public speaking, including audience analysis, outlining, research, delivery, critical listening and evaluation, presentational aids, and use of appropriate technology. *Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.*

COMM 102 Introduction to Interpersonal Communication

Transfer IN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in: ENGL 093 and ENGL 083 or ENGL 095 or FOUN 071. Focuses on the process of interpersonal communication as a dynamic and complex system of interactions. Provides theory, actual practice, and criticism for examining and changing human interactions in work, family, and social contexts. Includes topics such as perception, self-concept, language, message encoding and decoding, feedback, listening skills, conflict management, and other elements affecting interpersonal communication in various world contexts.

COMM 104 Workplace Communication

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 Introduction to College Writing and ENGL 083 Reading Strategies for College or ENGL 095 Integrated Reading and Writing or FOUN 071 Tech Foundations II.

COMM 201 Introduction to Mass Communication

Transfer IN 3 Credits

Prerequisites: ENGL 111 English Composition. A survey of the print and electronic media that compose the mass media industry. Included in the survey are the history, technology, utilization, and influence of corporate, creative, and social media as well as the combined symbiotic impact.

COMM 202 Small Group Communication

3 Credits

Prerequisites: ENGL 111. An introduction to communication principles and practices that enable small groups, such as committees, conferences and public discussions, to function effectively as well as the practices which limit small group effectiveness. The course is pragmatic in approach, and the student will learn small group dynamics through participation.

COMM 203 Oral Interpretation of Literature

3 Credits

Prerequisites: ENGL 111. Designed to develop the student's ability to select, analyze, interpret and communicate literature to diverse audiences and to enhance the student's appreciation of literature.

COMM 204 Voice and Articulation

3 Credits

Prerequisites: COMM 101. Designed to improve the student's vocal abilities by providing a body of knowledge about voice production and diction and enabling the student to use this knowledge for his/her self-improvement.

COMM 211 Introduction to Public Relations

3 Credits

Prerequisites: ENGL 111. The course provides an introduction to the concepts, principles, and practices of public relations, from the historical to the contemporary, including public relations philosophy and theory. The course will focus on topics such as the origins of public relations, the functions and practices of public relations from past to present, ethics and law, message strategies, and research methods pertaining to public relations.

COMM 280 Co-op/Internship

1-6 Credits

Prerequisites: Program Chair Approval. Provides students with the opportunity to work in an occupational setting that is related to career objectives within the communications field. Provides the student with on-the-job training and requisite technical skills while earning credit toward an associate degree.

CONT 101 Introduction to Construction Technology

3 Credits

Prerequisites: None. Presents history of building construction to present-day applications emphasizing future trends and construction as a career. Provides practice in the operation, maintenance and safety of various tools including the builder's level and transit.

CONT 127 Electrical Basics

3 Credits

Prerequisites: None. An introductory course covering both AC and DC circuits. Studies include electron theory, Ohm's Law, Watt's Law, Kirchoff's Law, series circuits, series-parallel circuits, electromagnetic induction, current, voltage, resistance, power, inductance, capacitance, and transformers. Demonstrates the use of electrical equipment, troubleshooting, installation of hardware, metering equipment, lights, switches, and safety procedures and practices.

CONT 204 Estimating and Specifications

3 Credits

Prerequisites: CONT 106. Involves students with estimating process for residential construction. Emphasizes reading blueprints and specifications, estimating labor costs, materials take-off and pricing.

CONT 279 Construction Technology Capstone

1 Credit

Prerequisites: Program Advisor Approval. Prepares the student for entry into construction. The course reviews the Construction Technology core courses. It provides a comprehensive evaluation of the level of proficiency of these courses. It also requires taking the outcomes assessment (CAAP) test.

CONT 280 Co-op/Internship

1-6 Credits

Prerequisites: Program Advisor Approval. Gives students the opportunity to work at a job site that is specifically related to their career objectives. Provides on-the-job experience while earning credit toward an associate degree.

CPIN 239 Systems Analysis and Design

3 Credits

Prerequisites: SDEV 140 or DBMS 130 or CSIA 105. Students will learn methodologies pertinent to the assessment, design, and implementation of information systems. Students will develop the skills necessary to analyze, design and manage the development of enterprise-scale information systems solutions incorporating contemporary methods and effective organizational and global project management practices. Students will actively participate in discussions, review selected articles, participate in team exercises and collaborate on projects involving analysis and prototyping of systems addressing real-world problems and integrating current and emerging technologies.

CPIN 269 Computing and Informatics Project Management

3 Credits

Prerequisites: Program Advisor Approval. Students will work within a team to identify and employ methodologies pertinent to the assessment, design and operation of business computer information systems. Teams will analyze and implement established and evolving methodologies for the development of a business-oriented computer environment. Students will develop individual and team competencies working to employ current software tools to generate and illustrate the flow of the actual development of a project.

CPIN 270 Workforce Preparation: CompTIA Project+ Certification

1 Credit

Prerequisites/Corequisites: CPIN 269. The workforce preparation course is focused on the CompTIA Project+ certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

CPIN 279 Computing and Informatics Exploration and Evaluation

1 Credit

Prerequisite: Program Chair Approval. Prepares students for entry into the information world. Reviews procedures for researching a career; preparing a resume and a portfolio; interviewing; team participation; and ethical/productive job performance. Additionally, all associate degree graduates are required to complete a Technical Outcomes Assessment specific to their program. This could be in the form of an assessment exam, a national certification exam, or a portfolio.

CPIN 280 Computing and Informatics Co-op/Internship/Externship

1-6 Credits

Prerequisite: Program Chair Approval. Provides students with the opportunity to work at a job site that is specifically related to their career objectives. Provides on-the-job experience while earning credit toward an associate degree. Fourth semester standing and a cumulative GPA of 2.0 or better is recommended for Internship students.

CPTR 205 Fundamental Kinesiology

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 and MATH 080; APHY 101. Co-Requisites: APHY 101. A focus is placed on how muscles, bones, and joint structures produce human motion, originating from a sedentary form to a physically active state. Students will focus on analyzing movements of the upper and lower extremities to become proficient in evaluating client movement. Students will be required to demonstrate practical applications pertaining to the study and teaching of the various skilled human movements.

CPTR 206 Modern Concepts in Exercise & Fitness

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095; and MATH 080; APHY 101. Co-Requisites: APHY 101. This course is an introduction to basic exercise program design and its role in health and wellness planning. It will emphasize the importance of client health evaluation prior to the engagement of moderate to rigorous activity. Course work will illustrate how this evaluation process will benefit and influence exercise program design.

CPTR 212 Foundations in Exercise Science

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095; MATH 080; APHY 102, CPTR 205, and CPTR 206. Co-Requisites: APHY 102, CPTR 205, and CPTR 206. The coursework offers students an essential foundation in exercise science. It will display the dynamic and growing field of sport, health, fitness, and wellness along with its disciplines. Students will learn about body systems, biomechanics, basic nutrition, exercise behavior, fitness, wellness, different types of training methodology, and basic sports medicine.

CPTR 220 Health Screening and Exercise Program Design Across Populations

3 Credits

Prerequisites: APHY 102, CPTR 212, and Basic Life Support for Healthcare Providers. Co-Requisites: CPTR 212, APHY 102, and Basic Life Support for Healthcare Providers. Health screening, fitness assessment/evaluation, and exercise programming will be the primary focus of this course. This course will introduce basic program design concepts and rationale for a healthy adult or exercise professional to implement in their exercise regimen that puts an emphasis on cardiovascular training, strength training, flexibility training, and balance. Students will learn techniques to motivate their clients along with the obligations that surround their professional scope of practice. Finally, the course will help qualify students to sit for and pass the American College of Sports Medicine Certified Personal Trainer exam.

CRIM 101 Introduction to Criminal Justice Systems

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093 or ENGL 095. An introductory and fundamental course that covers the purposes, functions, and history of the three primary parts of the criminal justice system: law enforcement, courts, and corrections. This course further explores the interrelationships and responsibilities of these three primary elements of the criminal justice system.

CRIM 103 Cultural Awareness

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This basic course emphasizes the study of American criminal justice problems and systems in historical and cultural perspectives, as well as discussing social and public policy factors affecting crime. Multidisciplinary and multicultural perspectives are emphasized.

CRIM 104 Victimology

3 Credits

Prerequisites: None. Supports a comprehensive review of the contemporary study of victimology, the complex subject of victimization and the American criminal justice process. The history of victimology and the so-called victim movement will be reviewed, and theories of victimization and the collection of victimization data will be discussed. Specific types of victimization, and societal reaction will be examined to include child maltreatment, intimate partner abuse, elderly abuse, conventional property and interpersonal criminal victimization, including sexual predation, and emergent crimes in cyberspace; and prospects for restorative justice and remediating the losses and harms and hardships and indignities suffered by crime victims will be assessed.

CRIM 105 Introduction to Criminology

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095. Critically examines the history and nature of the major theoretical perspectives in criminology, and the theories found within those perspectives. Analyzes the research support for such theories and perspectives, and the connections between theory and criminal justice system practice within all the major components of the criminal justice system. Demonstrates the application of specific theories to explain violent and non-violent criminal behavior on both the micro and macro levels of analysis.

CRIM 106 Introduction to Serial Killers

3 Credits

Prerequisites: None. This course examines serial murder through an analysis of the lives of serial killers in the United States. Biological, cultural, psychological and sociological frameworks are explored as an explanation of serial murder. This course will also look at the victims of the serial killers. This class will examine profiling and how the criminal justice system investigates, prosecutes and sentences serial killers.

CRIM 110 Introduction to Law Enforcement

3 Credits

Prerequisites: CRIM 101. Introduces fundamental law enforcement operations and organization. Includes the evolution of law enforcement at federal, state, and local levels.

CRIM 111 Introduction to Traffic Enforcement and Investigation

3 Credits

Prerequisites: CRIM 101. Examines the role of law enforcement in traffic safety, traffic administration, traffic laws, accident investigation, police safety, and patrol practices.

CRIM 113 Criminal Investigation

3 Credits

Prerequisites: CRIM 101. This course is a study of the elements and techniques of criminal investigations. Primary aspects include crime scene examination, collection of evidence and search for witnesses, developing and questioning suspects, and protecting the integrity of physical evidence found at the scene and while in transit to a forensic science laboratory. Procedures for the use and control of informants, inquiries keyed to basic leads, and other information-gathering activity and chain of custody procedures will also be reviewed.

CRIM 114 Introduction to Security

3 Credits

Prerequisites: CRIM 101. Introduces fundamental security operations and organization.

CRIM 117 Introduction to Forensics

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095. Studies the organization and analysis of investigative evidence, basic considerations in preparing evidential documentation for presentation in court, collection and preservation of physical evidence, and elements of legal proof in submission of evidence.

CRIM 120 Introduction to Courts

3 Credits

Prerequisites: CRIM 101. Introduces topics related to the adjudication process in criminal cases, including arraignments and preliminary hearings, suppression hearings, trials, sentencing, juvenile court, and probation and parole. Reviews the role of criminal justice personnel in court processes.

CRIM 130 Introduction to Corrections

3 Credits

Prerequisites: CRIM 101. This course examines the American correctional system; the study of administration of local, state, and federal correctional agencies. The examination also includes the history and development of correctional policies and practices, criminal sentencing, jails, prisons, alternative sentencing, prisoner rights, rehabilitation, and community corrections including probation and parole. Current philosophies of corrections and the debates surrounding the roles and effectiveness of criminal sentences, institutional procedures, technological developments, and special populations are discussed.

CRIM 134 Introduction to Criminal Justice Careers

2 Credits

Prerequisites: None. An introductory and fundamental course that covers topics of interest and importance to those contemplating a career in criminal justice: employment trends; principal criminal justice careers; fitness and preparation for criminal justice positions; job-seeking challenges and strategies; and, a candid conversation regarding jobs, careers, and your future.

CRIM 150 Juvenile Justice System

3 Credits

Prerequisites: CRIM 101. Examination of the philosophy and theory behind the juvenile justice system and its component parts or systems. Analysis of the police response to juvenile delinquency followed by the role of the prosecuting attorney, juvenile court personnel, juvenile correctional facilities, and community-based programs designed for juvenile offenders. The primary focus of attention will be on the level of integration of these systems into a coherent system of justice that effectively and equitably responds to juvenile crime. The level of cooperation and coordination existing between the various component parts of the juvenile justice system will be critiqued, and the effectiveness of the juvenile system as a whole will be evaluated. Also includes the role of the juvenile justice system within the context of social, political, and economic inequality.

CRIM 155 Introduction to Cyber Forensics

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course introduces students to an examination of computer-related crime and the legal issues in its investigation, with special emphasis on policing's investigative response. The course surveys the subject of computer-related crime, cyber crime law, and computer crime investigation including the management and custody of evidence.

CRIM 171 Drugs and Justice

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. The spectre of substance abuse has played a definitive role in the evolution of American justice for nearly a century. And the response of the criminal justice system is complex and controversial. This course introduces students to an examination of the subject title Drugs and Justice, with especial emphasis on policing's investigative and enforcement response. The course surveys issues of drug use, abuse, and criminal justice policy in a society author Mike Gray characterizes as "Drug Crazy."

CRIM 201 Ethics in Criminal Justice

3 Credits

Prerequisites: CRIM 101. A discussion of ethical theories and their considerations in the administration of criminal justice as well as the application to contemporary institutions and problems.

CRIM 204 Interview and Interrogation

3 Credits

Prerequisites: CRIM 101 and CRIM 103 and CRIM 105. This course introduces students to the art of interviewing and interrogation, and further introduces them to the individual personality of the witness and/or suspect, and the means in which to secure valid information, admissions, and confessions, obtained legally and ethically, that are corroborative in nature, and that can be used to solve crimes and be introduced as evidence in court proceedings.

CRIM 205 Procedural Criminal Law

3 Credits

Prerequisites: CRIM 101. This course covers the theory and practice of procedural criminal law and introduces the student to the laws of arrest, search and seizure, probable cause, due process, confessions, suspect identification and the many types of surveillances, all the while emphasizing Indiana Criminal Law.

CRIM 210 Police and Community Relations

3 Credits

Prerequisites: CRIM 101. This course introduces police-community relations, examines trends, practices, social and individual effects of police work. Emphasis on police line and support operations. Analysis of operations, enforcement policy, operations during civil disorders and disaster, as well as the role of the police officer in achieving and maintaining public support, human relations, and relationship with violators and complainants.

CRIM 211 Criminal Law

3 Credits

Prerequisites: CRIM 101. A theoretical and practical survey of criminal law in the United States. This includes examining conduct that constitutes crimes and the punishments deemed appropriate for such acts. Emphasis is placed on the criminal law as it is applied and interpreted both federally, through the U.S. Supreme Court, and in the state of Indiana through the Indiana Code and state court decisions. Course topics include the American criminal justice system, criminal liability, the elements of specific crimes, constitutional limits, the Indiana Code (with specific emphasis on the penal code), criminal defenses, victims, punishments and sentencing.

CRIM 212 Use of Force **3 Credits**

Prerequisite: None. Provides hands on training in use of various forms of force in the performance of police duties in the field. Students will receive instruction in the use of physical force, use of chemical agents, use of firearms, defensive tactics, and working with police dogs. Students will also receive live firearms operation instruction and live-fire qualification testing.

CRIM 213 Field Practice **3 Credits**

Prerequisite: None. Provides hands on training in how to handle various situations encountered by law enforcement agents in the field. The student will study the considerations and intervention techniques used by police in dealing with various types of incidents: suicide management, conflict management, elderly abuse, domestic violence, critical incidents, dealing with street gangs, hate crimes, sexual assault, and criminal profiling, etc.

CRIM 215 Police Administration and Organization **3 Credits**

Prerequisites: CRIM 101. Emphasizes the basic principles of law enforcement administration and organizational structure, their function and activities, records, communication, public relations, personnel and training, policy formation, evaluation of personnel and complaint processing and planning. The student who successfully completes this course will have an understanding of traditional and contemporary management approaches and techniques.

CRIM 217 Advanced Forensics I **3 Credits**

Prerequisites: BIOL 101 or CHEM 101. Advanced course addressing the biological aspects of forensic science with emphasis on laboratory techniques, laboratory reporting and identification of biological evidence in forensics.

CRIM 218 Advanced Forensics II **3 Credits**

Prerequisites: CRIM 217. Advanced course addressing the anatomical aspects of forensic science with emphasis on identification of biological evidence in forensic pathology, including odontology, anthropology, taphonomy, bacteria and viruses, protists, fungi, plants and invertebrates and vertebrates in forensics.

CRIM 220 Criminal Evidence **3 Credits**

Prerequisites: CRIM 101. Examines the rules of evidence as applied in criminal investigation and criminal court with a discussion of relevant issues and legal standards.

CRIM 230 Community-Based Corrections **3 Credits**

Prerequisites: CRIM 130. Reviews programs for convicted offenders that are alternatives to incarceration, including diversion, house arrest, restitution, community service, and other topics. Reviews post-incarceration situations, probation and parole.

CRIM 231 Special Issues in Corrections **3 Credits**

Prerequisites: CRIM 130. Investigates topics of special interest related to corrections with an emphasis on the classification and treatment of inmates. Topics may vary to reflect contemporary corrections issues.

CRIM 246 Legal Issues in Corrections **3 Credits**

Prerequisites: CRIM 130. Examines the four historical stages of development of the American prison system and the six major rationales for punishment associated with those stages. Identifies the criminological perspectives that inform the rationales for punishment, and the correctional policy implications relative to each rationale. Analyzes the research support for each of the six rationales for punishment, and the policy implications associated with them. Connects relevant legal issues to the correctional policy implications relative to each rationale for punishment. Locates appellate court decisions relative to correctional policy within the context of contemporary social, economic, and political conditions and controversies. Identifies the specific rights of prisoners and the responsibilities of the state with respect to the conditions of confinement.

CRIM 250 Juvenile Law and Procedures **3 Credits**

Prerequisites: CRIM 150. Examination of the philosophy and theory behind the juvenile justice system and how juvenile law reflects that philosophy. Examination of the development of juvenile law and procedures, early juvenile law, landmark Supreme Court cases in juvenile justice, issues in juvenile law, and juvenile adjudicatory proceedings.

CRIM 251 Special Issues in Youth Services **3 Credits**

Prerequisites: CRIM 150 or HUMS 215. Examines issues commonly experienced in the youth care field.

CRIM 252 Juvenile Delinquency **3 Credits**

Prerequisites: CRIM 101. Provides an overview of the concepts, definitions, theories and measurements of juvenile delinquency. Looks at the role of environmental influences (peers, gangs, school and drugs). Develop a working knowledge of the concepts of delinquency and the concern for children of our society. Discusses an overview of the history and philosophy of the juvenile justice systems as well as ways to control and treat juvenile offenders.

CRIM 260 Research Methods in Criminal Justice

3 Credits

Prerequisites: CRIM 101 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or higher. The course will familiarize students with the basic concepts, techniques and problems associated with conducting research in criminal justice. The course will provide students with the analytical and critical thinking skills required to understand empirical research. Students will also acquire the necessary tools to conceptualize and conduct a research project. Students will examine the advantages and limitations of decisions that are made in the process of conducting research. Problems specific to research in criminal justice will be explored.

CRIM 271 Terrorism

3 Credits

Prerequisites: CRIM 101. This course introduces students to an examination of terrorism and America's criminal justice system, with special emphasis on policing's investigative response. Organizational preparedness and response by America's criminal justice system to this global threat.

CRIM 280 Internship

4 Credits

Prerequisites: Program Advisor Approval. Provides fieldwork experience in an approved social, educational, law enforcement, corrections or other criminal justice organization.

CRIM 281-294 Special Topics

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in criminal justice. Identifies and offers various special topics during each term under this course number.

CSCI 101 Computer Science I

3 Credits

Corequisites: MATH 136 and MATH 137 or demonstrated competency through appropriate assessment. Introduces the fundamental concepts of procedural programming. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging. The course also offers an introduction to the historical and social context of computing and an overview of computer science as a discipline.

CSCI 105 Discrete Logic for Computers

3 Credits

Prerequisites: CSCI 101 and MATH 211. Corequisite: MATH 211. This course introduces students to discrete mathematical concepts including reasoning and proof, especially with the discrete phenomenon often used in the field of Computer Science. Students will learn the applicable mathematical vocabulary and its correct usage. Other topics include sets, functions, notation, proofs, proof techniques, relations, induction, counting and countability, probability, and partitions.

CSCI 201 Computer Science II

3 Credits

Prerequisites: CSCI 101 and MATH 211. Corequisites: MATH 211. Provides a working understanding of the fundamentals of procedural and object-oriented program development using structured, modular concepts and modern object-oriented programming languages. Reviews control structures, functions, data types, variables, arrays, and data file access methods. This is a first-level course in object-oriented computer programming, using a language such as Java or C++. Object-oriented concepts studied include classes, exception handling, recursion, abstract data types, streams and file I/O, reusable software, and event-driven programming.

CSCI 202 Data Structures

3 Credits

Prerequisites: CSCI 201. Builds on the foundation of CSCI II to provide a working understanding of the fundamentals of data structures and algorithms used in modern computer programming. Introduces a variety of data storage alternatives, including stacks, queues, linked lists, hash tables, trees and graphs. Employs the basics of algorithmic analysis, recursion, language translation and software engineering. Discusses the overview, history and comparison of programming languages, as well as virtual machines and language translation.

CSCI 205 Computer Organization and Architecture

3 Credits

Prerequisites: CSCI 202. Corequisites: CSCI 202. This course introduces the concepts related to the organization and architecture of digital computers. The course begins with a discussion of data representations (fixed, floating point numbers, ASCII, Unicode, etc.), as well as arithmetic operations. The course discusses the architecture of instruction sets using both machine and assembly. The importance of data path, timing, and control are presented. The processes of program compilation, assembly, linking and loading are covered. Considerable time is devoted to hardware-related topics such as memory, buses, peripherals, and networking. The course concludes with a presentation of advanced architectural concepts such as parallel and superscalar machines.

CSCI 210 Database Systems

3 Credits

Corequisite: CSCI 105. This course presents the theory and practice of database systems and gives an advanced introduction into the concepts for modeling, designing, querying, and managing large and distributed databases. The emphasis will be on theoretical considerations involved in modeling data and the principles of database systems in a multi-user environment. Students will address issues associated with enterprise database processing with respect to user authentication and development in an application/internet environment.

CSCI 279 Capstone Course

1 Credit

Prerequisites: Program Advisor Approval. Prepare the student for entry into the world of Computer Science. Reviews procedures for interviewing, team participation, and ethical and productive job performance. Provides for taking program outcomes assessments.

CSCI 281 – 294 Special Topics

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in computer science. Identifies and offers various special topics during each term under this course number.

CSIA 105 Introduction to Cyber Security/ Information Assurance

3 Credits

Prerequisites: ITSP 135. The students will explore the field of Cyber Security/Information Assurance focusing on the technical and managerial aspects of the discipline. Students will be introduced to the basic terminology, concepts, and best practices of computer/network security and the roles and responsibilities of management/security personnel. The students will learn the technologies used and techniques involved in creating a secure computer networking environment including authentication and the types of attacks against an organization.

CSIA 106 Workforce Preparation: CompTIA Security+ Certification

1 Credit

Prerequisites: CSIA 105. Corequisites: CSIA 105. The workforce preparation course is focused on the CompTIA Security+ certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

CSIA 135 Digital Forensics

3 Credits

Prerequisites: ITSP 135. Provides students with an understanding of the detailed methodological approach to computer forensics and evidence analysis. Students will acquire hands-on experience with various forensic investigation techniques and standard tools necessary to successfully carry-out a computer forensic investigation.

CSIA 181-194 Special Topics in Cyber Security/Information Assurance

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in introductory cyber security/information assurance with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

CSIA 210 Network Protocol Analysis

3 Credits

Prerequisites: NETI 105 and ITSP 135. Offers in-depth coverage of all the salient models, protocols, services, and standards that govern TCP/IP and that guide its behavior on modern networks. Specific guidance is given to reinforce the concepts introduced and to help prepare students to interact with TCP/IP on the vast majority of networks in use today. As a hands-on course, students are provided firsthand experience in installing, configuring, analyzing, using, and managing TCP/IP on a network. Included are case projects that pose problems and require creative solutions that should prepare students for the kinds of situations faced on a real, live network.

CSIA 215 Perimeter Defense

3 Credits

Prerequisites: NETI 115. Provides an advanced understanding of the concepts involved in firewalls, routers, intrusion detection, intrusion prevention and Virtual Private Networks (VPNs) in relationship to the overall enterprise network strategy. Students will learn advanced network security installation techniques; advanced network security troubleshooting; and how to make intelligent choices in firewall and router technology. Additionally, the students will have a comprehensive look at the use of routers and switches with other network security components in configuring De-Militarized Zones (DMZ) and VPNs for optimal perimeter security. Students will study such topics as packet filtering, proxy servers, authentication, encryption, and securing host computers.

CSIA 225 Ethical Hacking

3 Credits

Prerequisites: NETI 105 and SVAD 111. Students will learn threats and defense mechanisms; web applications and data servers; Linux, Macintosh and mobile systems; and secure network infrastructures. Hands-on practical application will be included as preparation for the Certified Ethical Hacker exam by EC-Council.

CSIA 235 Advanced Digital Forensics

3 Credits

Prerequisites: CSIA 135. This advanced forensics course gives students the skills necessary to identify, track, and prosecute cybercriminals. This course enables students to excel in digital evidence acquisition/handling and analysis in a forensically sound manner. Advanced forensics techniques and tools will be covered.

CSIA 260 Business Continuity in an Information World

3 Credits

Prerequisites: CSIA105. Students will learn principles of incident response and disaster recovery. Identification of vulnerabilities and appropriate countermeasures to prevent and mitigate risks to an organization will be discussed. Students will learn risk assessment, incident response, contingency planning, and prioritizing systems for disaster recovery. The importance of management's roles and interaction with other organizational members will be discussed. Students will learn how to create a hardened network by developing system specific plans for the protection of intellectual property, the implementation of access controls, and patch/change management. Students will gain an understanding of information assurance including the governing rules and guidelines.

CSIA 281-294 Advanced Special Topics in Cyber Security/Information Assurance **1-3 Credits**

Prerequisites: Program Advisor Approval. Discusses topics of current interest in cyber security/information assurance with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

CSTC 102 Surgical Instrumentation **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in or ENGL 093 and ENGL 083 or ENGL 095 Corequisite: CSTC 105. Prepares the student to identify surgical instruments by category, type and use. Emphasis on quality assurance enables the student to inspect, assemble and prepare instrumentation for packaging.

CSTC 105 Fundamentals of Central Service Technician Skills **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in or ENGL 093 and ENGL 083 or ENGL 095 Corequisite: CSTC102. Introduce the field of central service and the personnel within the department. The principles and importance of the flow of material are determined. The student will learn about environmental control factors affecting the central service department. The student will differentiate between equipment management systems and compare out-sourcing and insourcing. Various types of purchasing issues and inventory methods will be explored.

CSTC 107 Applications of Central Service Technician Skills **3 Credits**

Prerequisites: CSTC 102 and CTSC 105. Emphasis on the practice of high and low sterilization methods. Students will differentiate between the various sterilization methods. Students will learn the protocol for control infection and the spread of blood borne pathogens.

CSTC 108 Clinical Experiential Seminar **5.5 Credits**

Prerequisites: CSTC 102, CSTC 105, and CSTC 107. Allows the student the opportunity to complete practical hours in a Central Processing department. Prepares and provides the students with the hours needed to take the International Association of Healthcare Central Service Material Management (IAHCSMM) Certification Exam.

DBMS 110 Database Design and Management **3 Credits**

Prerequisites: INFM 109. Corequisites: INFM 109. Introduces students to the basic concepts of databases including the types of databases, the general database environment, and the importance of data to the business world. Discussion with hands-on activities will include database design, normalization of tables, and development of tables, queries, reports, and applications. Students will be familiarized with use of the ANSI standard Structured Query Language. Discussions will include database administration and data maintenance. Students will be introduced to data concepts such as data warehousing, data mining, and BIG Data. Students will develop a business application using database software such as Microsoft Access. Students will be required to demonstrate skills such as team building, work ethic, communications, documentation, and adaptability.

DBMS 111 Workforce Preparation: MTA Database Fundamentals Certification **1 Credit**

Prerequisites: DBMS 110. Corequisites: DBMS 110. The workforce preparation course is focused on the MTA - Database Fundamentals certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

DBMS 120 Database Server Installation and the Virtual Environment **3 Credits**

Prerequisites: DBMS 110 and ITSP 135. Corequisites: DBMS 110 and ITSP 135. Introduces students to terminology, concepts, theory, and practice of installing, implementing, and maintaining a database server. Discussion will include the relationships between network servers and database servers. Students will explore server virtualization and using data servers in virtual environments. Students will be introduced to database and database server security concepts.

DBMS 130 Data Management Using Structured Query Language **3 Credits**

Prerequisites: DBMS 110. Students are introduced to Structured Query Language (SQL) which is a database computer language used to manage, query, retrieve and manipulate data. Students are introduced to SQL as a high level tool in the management of data in client and server database environments. Students will use relational database management systems such as MySQL, Oracle, and/or SQL Server to develop SQL skills in a lab environment.

DBMS 131 Workforce Preparation: Oracle SQL Foundations Certification **1 Credit**

Prerequisites/Corequisites: DBMS 130. The workforce preparation course is focused on the Oracle SQL Foundations certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

DBMS 150 Database Administration

3 Credits

Prerequisites: DBMS 110 and DBMS 120. Corequisite: DBMS 120. Introduces program applications in an Oracle database environment with emphasis on installing, configuring, modifying, and maintaining the database by means of structured query language and Enterprise Manager. Students will discuss data structures; indexed and direct file organizations; models of data, including hierarchical, network and relational; storage philosophies, data administration and analysis; design; and implementation

DBMS 151 Workforce Preparation: Oracle Administration I Certification

1 Credit

Prerequisites: DBMS 150. Corequisites: DBMS 150. The workforce preparation course is focused on the Oracle Administration I certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

DBMS 181-194 Special Topics in Database Management and Administration

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in introductory database management and administration with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

DBMS 210 Advanced Database Design

3 Credits

Prerequisites: DBMS 110. Emphasizes the development of advanced applications in database management using software such as Microsoft Access, Oracle APEX, Salesforce or JBase. Students will learn methods of data import and export; advanced table properties; advanced queries and basic SQL; form and report design; macros/scripts for automating database tasks; and building menu-driven applications. Students will produce a cumulative final database application project. Students may demonstrate course objectives through the appropriate certification exam preparation materials such as Microsoft Office Specialist.

DBMS 230 Oracle PL/SQL and Microsoft T-SQL

3 Credits

Prerequisites: DBMS 130. Students will focus on developing applications in a Microsoft SQL Server and Oracle environments. Students will build and test applications using the functionality of tools in Microsoft SQL Server and Oracle. Students will develop and test applications functionality across multiple platforms and environments, deploy to production code, and build and validate enterprise-ready solutions.

DBMS 231 Workforce Preparation: Designing Database Solution for SQL Server Certification

1 Credit

Prerequisites: DBMS 230. Corequisites: DBMS 230. The workforce preparation course is focused on the Designing Database Solutions for SQL Server certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

DBMS 240 Microsoft SQL Server Maintenance

3 Credits

Prerequisites: DBMS 130. Microsoft SQL Server Maintenance involves students installing, configuring and maintaining a Microsoft SQL Server. Students explore the automatic database management, monitoring and tuning facilities of Microsoft SQL Server. Discussion covers all aspects of running Microsoft SQL Server, including managing security, monitoring, troubleshooting, and optimizing performance. Additional topics will include controlling resource utilization; using database scheduler; handling database corruption; data backup and recovery; and troubleshooting database problems.

DBMS 241 Workforce Preparation: Administering Microsoft SQL Server 2012 Database Certification

1 Credit

Prerequisites: DBMS 240. Corequisites: DBMS 240. The workforce preparation course is focused on Administering Microsoft SQL Server 2012 Database Certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

DBMS 250 Oracle Database Administration II

3 Credits

Prerequisites: DBMS 150. Students explore the automatic database management, monitoring, and tuning facilities in an Oracle database environment. Topics include the recovery from user errors and database failures including flashback data archive and flashback transaction backout along with the Total Recall capability. Oracle Database Administration II includes topics controlling resource utilization, using database scheduler, handling database corruption, and troubleshooting database problems. Students will set up user-managed/automatically managed backup strategies and database recovery operations. Additionally, students will explore advanced use of Enterprise Manager Wizards, tools, and automatic storage management.

DBMS 251 Workforce Preparation: Oracle Administration II Certification**1 Credit**

Prerequisites: DBMS 250. Corequisites: DBMS 250. The workforce preparation course is focused on the Oracle Administration II Certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

DBMS 255 Advanced Database Applications Development**3 Credits**

Prerequisites: DBMS 120 and DBMS 130. Advanced Database Application Development students will develop applications in an Oracle and Salesforce database environment. Students will utilize an integrated platform that supports Structured Query Language, Extensible Markup Language, and procedural languages in a simple fashion with high performance and scalability. Advanced Database Application Development students will use many of the features of database application development including languages, tools, connectivity and technologies in a culminating database application development project.

DBMS 256 Workforce Preparation: Salesforce Developer Certification**3 Credits**

Prerequisites/Corequisites: DBMS 255. The workforce preparation course is focused on the Salesforce Developer Certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

DBMS 281-294 Advanced Special Topics in Database Management and Administration**1-3 Credits**

Prerequisites: Program Advisor Approval. Discusses topics of current interest in database management and administration with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

DENT 102 Dental Materials and Lab I**3 Credits**

Prerequisites: Admission to the Dental Assisting program. This is the first in a series of two courses that reviews in depth the properties of dental materials, proper modes of manipulation, necessary armamentarium used, and the technical duties required of dental assistants. Stresses clinical behavior of materials and biological factors of importance to dental assisting.

DENT 115 Preclinical Practice I**4 Credits**

Prerequisites: Admission to the Dental Assisting program. This is the second in a series of two in depth courses that is a continuation of Preclinical Practice I. The following dental specialties are presented: Oral and Maxillofacial Surgery, Periodontics, Endodontics, Pediatric Dentistry, Orthodontics, Prosthodontics, and Dental Public Health.

DENT 116 Dental Emergencies/Pharmacology**2 Credits**

Prerequisites: Admission to the Dental Assisting program. An in-depth course that surveys the most commonly utilized and required first aid measures for emergencies. Examines proper techniques and procedures as well as equipment, medications and positioning for care of the patient. Reviews anatomy/physiology and cardiopulmonary rescue as provided by the American Heart Association.

DENT 117 Dental Office Management**2 Credits**

Prerequisites: DENT 115 and DENT 123. Focus on the principles of administrative planning, bookkeeping, recall programs, banking, tax records, computer software, insurance, office practice and management as related to the dental office. Attention is given to techniques of appointment control, record keeping and credit and payment plans.

DENT 118 Dental Radiography**4 Credits**

Prerequisites: DENT 115 and DENT 123. This is an in-depth course that focuses on the principles, benefits, effects, and control of X-ray production. Covers history, radiation sources, modern dental radiographic equipment and techniques, anatomical landmarks, dental films and processing. Emphasizes avoidance of errors while exposing and processing dental radiographs. The Radiation Health and Safety component of the Dental Assisting National Board exam and the fee for this exam is assessed upon enrollment in the course.

DENT 122 Clinical Practicum**1 Credit**

Prerequisites: DENT 102, DENT 115 and DENT 123. An in-depth course that focuses on the performance of chairside skills that are applied in a clinical office situation on live patients.

DENT 123 Dental Anatomy**3 Credits**

Prerequisites: Admission to the Dental Assisting Program. This is an in-depth course that focuses on oral, head and neck anatomy, basic embryology, histology, tooth morphology and charting dental surfaces related to the dental field. Includes dental anomalies, pathological conditions and terminology relevant to effective communication. Human anatomy is also covered as a familiarity level.

DENT 124 Preventive Dentistry/Diet and Nutrition**2 Credits**

Prerequisites: DENT 115 and DENT 123. Corequisites: DENT 115 and DENT 123. An in-depth course that emphasizes the importance of preventive dentistry and the effects of diet and nutrition on dental health techniques of assisting patients in the maintenance of good oral hygiene.

DENT 125 Preclinical Practice II**3 Credits**

Prerequisites: DENT 102, DENT 115, DENT 116 and DENT 123. The second in a series of two in-depth courses that continues Preclinical Practice I. Anesthesia is presented. The following dental specialties are presented: Oral and Maxillofacial Surgery, Periodontics, Endodontics, Pediatric Dentistry, Orthodontics, Prosthodontics, and Dental Public Health.

DENT 128 Coronal Polishing and Caries Prevention for the Dental Assistant**1 Credit**

Prerequisites: DENT 102, DENT 115, DENT 122, DENT 123, DENT 124, DENT 125. This course will cover the didactic, laboratory and clinical aspects of coronal polishing utilizing a rubber cup and an occlusal bristle brush on a slow speed motor and the topical application of medicaments for caries prevention. Concepts will include the theory of selective polishing and guidelines for fluoride application. The ethical theory of appropriate patient treatment will be presented and discussed.

DENT 129 Dental Materials and Lab II**3 Credits**

Prerequisites: DENT 102. The second in a series of two in-depth courses that reviews the properties of dental materials, proper modes of manipulation, necessary armamentarium used, and technical duties dental assistants can perform. Stresses clinical behavior of materials and biological factors of importance to dental assistant.

DENT 130 Clinical Externship**5 Credits**

Prerequisites: DENT 122 and Program Advisor approval. An in depth clinical learning experience that provides increased practical chair side dental assisting experience to be gained from private dental practices in general and specialty areas of dentistry. Opportunity for increased skill development in clinical support and business office procedures also provided.

DENT 132 Expanded Functions for Dental Assistants**3 Credits**

Prerequisites: DENT 122, DENT 123, DENT 125, DENT 129. Co-Requisites: DENT 122, DENT 125, DENT 129. Applies theory and techniques at the laboratory competency level of restorative dentistry to facilitate increased production potentials in the dental office. Students are instructed in the various extended functions as allowed by the Indiana Dental Law and the Board of Dental Examiners.

DENT 171 Dental Terminology**3 Credits**

Prerequisites: None. This is an in-depth course that focuses on basic terminology required of the dental assisting professional and provides a basic knowledge of anatomy and physiology, pathology, special procedures, laboratory procedures, and pharmacology. Dental vocabulary foundation increases through study and application of medical terminology word elements.

DESN 101 Introduction to Design Technology**3 Credits**

Prerequisites: None. The purpose of this introductory course is to provide students with a basic understanding of sketching practices and the features and considerations associated with the operation of computer-aided design (CAD) systems. Students will gain valuable hands-on experience creating sketches and using CAD software. Students will complete project(s) (increasing in difficulty) relating to specific technical drawing communication topics and disciplines.

DESN 102 Technical Graphics**3 Credits**

Prerequisites: None. Provides students with a basic understanding of the detailing skills commonly used by a drafting technician. Areas of study include: lettering, sketching, proper use of equipment, geometric constructions with emphasis on orthographic (multi-view) drawings that are dimensioned and noted to ANSI standards.

DESN 103 CAD Fundamentals**3 Credits**

Prerequisites: None. Provides students with a basic understanding of the features and considerations associated with the operation of a computer-aided design (CAD) system. Students will gain valuable hands-on experience using CAD software. They will be expected to complete several projects (increasing in difficulty) relating to command topics covered on a weekly basis.

DESN 104 Mechanical Graphics**3 Credits**

Prerequisites: DESN 101. Covers working drawings both in detailing and assembly. Presents fastening devices, thread symbols and nomenclature, surface texture symbols, classes of fits, and the use of parts lists, title blocks and revision blocks.

DESN 105 Architectural Design I**3 Credits**

Prerequisites: DESN 101. Presents a history and survey of architecture and focuses on creative design of buildings in a studio environment. Covers problems of site analysis, facilities programming, space planning, conceptual design, proper use of materials, selection of structure and construction techniques. Develops presentation drawings, and requires oral presentations and critiques. Generation of form and space is addressed through basic architectural theory, related architectural styles, design strategies, and a visual representation of the student's design process.

DESN 106 Descriptive Geometry

3 Credits

Prerequisites: DESN 102. Introduces fundamental principles in developing graphical solutions to engineering problems. Topics covered in this course include true length, piercing points on a plane, line intersections, true shapes, revolutions, and developments using successive auxiliary views.

DESN 107 History of Architecture

3 Credits

Prerequisites: None. History of Architecture studies the ingenuity and imagination of the human spirit in shaping the built environment related to cultural, political, social, and technological history. Presents a survey of architectural styles, architects, design philosophies, and building materials used by time, period, country, region and city. Requires oral presentations, essays, term papers, research and small projects. Field trips to historical architectural sites are a part of this course.

DESN 108 Residential Design

3 Credits

Prerequisites: DESN 101. Covers residential design and drafting. Includes interior space planning, structural design and development of working drawings. Provides opportunity for students to design a residence using accepted building standards.

DESN 109 Construction Materials and Specifications

3 Credits

Prerequisites: None. Introduces various construction materials, composition and application. Studies specifications of materials, construction contracts, and applications required in the building industry.

DESN 110 Architectural Rendering

3 Credits

Prerequisites: DESN 102. Presents a survey of pictorial drawings. Studies light and color, rendering media, and application of different architectural rendering techniques and media through a series of exercises.

DESN 113 2D Computer-Aided Design

3 Credits

Prerequisites: None. This intermediate course improves the Prerequisites: DESN 101. This course improves the student's CAD ability by presenting CAD commands, which will lead to the creation of advanced prototype drawings, graphic manipulation of symbol libraries, the utilization of advanced dimensioning techniques, and application of data sharing techniques. Detailed plotting instruction will also be covered.

DESN 115 BIM Architecture

3 Credits

Prerequisites: DESN 101. Building Information Modeling (BIM) software helps designers capture and analyze early concepts, and then better maintain designs through documentation and construction. This creates a collaborative, integrated building design process by sharing essential BIM data with your partners, and BIM workflows to help drive more efficient sustainable design analysis, clash detection, construction planning, and material fabrication.

DESN 130 Fundamentals of Computer Graphics

3 Credits

Prerequisites: None. Introduces students to raster and vector based applications as they relate to the CAD field. Demonstrates the knowledge of devices used in the creation and for the output of drawings. Understand the importance of graphics in the design process and how it impacts the design field. These skills are developed by producing work from related applications.

DESN 131 Industrial Sketching

3 Credits

Prerequisites: None. Combines fundamental computer graphics concepts of design, visualization, communication and display within an industrial sketching metaphor. Exercises and projects in graphic theory, problem solving and sketching skill development provide students with activities that focus on further development within CADD, vector imaging, raster imaging and other related formats. A variety of sketching techniques are used to gather critical information and transform graphical data into effective design communication instruments. Produces samples for student portfolios.

DESN 132 Raster Imaging Fundamentals

3 Credits

Prerequisites: DESN 130. Provides intermediate instruction in illustration techniques using computer software designed for creating illustrations, technical, drawing, logos, packaging, maps, charts, and graphs utilizing CADD data. Emphasis is on preparing effective, creative illustrations for various media applications in an efficient, productive manner. Produces samples for student portfolios.

DESN 133 Vector Imaging Fundamentals

3 Credits

Prerequisites: DESN 130. Provides fundamental instruction in working with vector images (CAD drawings) while applying elements and principles of design to illustrations for various output. Combines color theory, creativity, type and layout design for renderings.

DESN 134 Design for Visualization and Communication

3 Credits

Prerequisites: DESN 130. A follow-up course to further explore software and design principles utilizing page layout software. Students develop an understanding of an industry recognized digital publishing package. The focus is on visual thinking, exploring the relationship between type, image, format, and developing multiple solutions to a given problem. The course produces samples for student portfolios, which may include: charts, brochures, flyers, tables, technical training materials and catalog pages.

DESN 138 2D Animation**3 Credits**

Prerequisites: DESN 130. Provides fundamental instruction how animation scripts are developed as well as how visual stories are told through technical elements such as composition, lighting, framing and perspective. Exploring how to tap into creativity and create interesting original animations.

DESN 195 Manufacturing Principles & Design**3 Credits**

Prerequisites: DESN 113. The purpose of this introductory course is to provide students with a basic understanding of manufacturing principles and design and how they relate to technical drawing and design. Students will use their knowledge of 2D and 3D CAD to explore topics related to manufacturing.

DESN 201 Schematics**3 Credits**

Prerequisites: DESN 101. This course includes the layout of the various types of schematic drawings. Students will prepare finished drawings for the manufacture or installation of plumbing, heating, electrical, electronic and fluid power drawings.

DESN 202 CAD Customization and Programming**3 Credits**

Prerequisites: DESN 101. Covers customizing of a CAD system. Covers methods used to make CAD system more efficient for the individual user.

DESN 204 Architectural Design II**3 Credits**

Prerequisites: DESN 105. Presents advanced computer-aided design topics in architectural design. Utilizes current (UBC) information for project design. Includes all necessary drawings needed for the construction process.

DESN 206 Mechanical and Electrical Equipment**3 Credits**

Prerequisites: DESN 101 and MATH 122 or MATH 136 or MATH 137. Focuses on mechanical and electrical requirements for buildings. Studies electrical load calculations, wire sizing and circuits, plumbing requirements, fixture units and pipe sizing. Includes heating systems, duct layout and sizing.

DESN 207 Die Design**3 Credits**

Prerequisites: DESN 104. Studies the detailing and design of blanking, piercing, and forming dies. Covers material reaction to shear, cutting clearances and net gauging.

DESN 208 Structural Design and Detailing**3 Credits**

Prerequisites: DESN 101 and DESN 109 and MATH 122 or MATH 136 or MATH 137. Focuses on the design and detailing of commercial structural members, their connections, materials and methods of construction. Concentrates on traditional materials such as reinforced concrete, masonry, steel, and timber. Develops understanding of element behavior, its significance to detailing, and establishes the ability to prepare working drawings for structural projects.

DESN 209 Estimating**3 Credits**

Prerequisites: DESN 109. This course provides students with an understanding of building an estimate of the probable construction costs for any given project. To prepare an estimate of quantities, the student estimator must become familiar with working drawings, specifications, and various bid documents. While computerized estimating software is commonplace in industry, it is also essential that the student is able to apply the math theory behind quantification.

DESN 210 Surveying**3 Credits**

Prerequisites: MATH 122 or MATH 136 or MATH 137. This course provides students with a basic understanding of surveying equipment, procedures for performing measurements, turning angles, determining grades and other field applications. Surveying techniques and computations using the level, chain, and transit in calculating areas, lines, and grades will be covered in this course.

DESN 211 BIM Design I**3 Credits**

Prerequisites: MATH 122 or MATH 136 or MATH 137. Focuses on the planning and drawing of commercial or residential structures. Students will produce working drawings for pre-engineered and concrete/steel structures. Provides Design Technology students with essential skills to perform structural analysis of buildings.

DESN 212 Commercial Structures II**3 Credits**

Prerequisites: DESN 211. Focuses on the planning and drawing of commercial structures. Uses working drawings for pre-engineered and concrete/steel structures. Applies lessons learned from DESN 211 to new structure(s).

DESN 213 CAD Mapping**3 Credits**

Prerequisites: DESN 101. This course covers the concepts of map-making with CAD software and typical media found in the industry. Civil application of mapping procedures including profiles, topography, and site plans will also be discussed.

DESN 214 Kinematics of Machinery**3 Credits**

Prerequisites: DESN 104 and MATH 122 or MATH 136 or MATH 137. This non-calculus based course studies the application of kinematics theories to real world machinery. Static and motion applications will be studied. .

DESN 215 Electronic Schematics**3 Credits**

Prerequisites: DESN 101. Introduces students to electronic schematics, standardized symbols, and acceptable practices in creating various electrical and electronic drawings. Emphasizes the creation and manipulation of basic symbols, connection diagrams, block and logic diagrams, including the use of figure parts and data extraction. Introduction to analog and digital multimeters and other electronic measuring instruments.

DESN 216 Jig and Fixture Design**3 Credits**

Prerequisites: DESN 104. The processes of drafting and design as applied to tooling. Emphasizes tooling, locators, supports, holding devices, clearances and design as it pertains to jig and fixtures.

DESN 217 Design Process and Applications**3 Credits**

Prerequisites: DESN 220 or METC 220. Provides the student an opportunity to apply all previously acquired knowledge in the design of a new or existing consumer product or project. Students will study the design processes with consideration given to the function, aesthetics, cost economics and marketability of the product or project. A research paper and product illustration is required in this course.

DESN 218 Intro to Statics and Strength of Materials**3 Credits**

Prerequisites: MATH 122 or MATH 136 or MATH 137. This course is an introduction to design practices through the development of a foundational understanding of the applied forces and moments needed to maintain load-bearing structures in static equilibrium and the internal stresses developed within these structures.

DESN 219 Asset Development and Multimedia Design**3 Credits**

Prerequisites: DESN 130. Explores the interaction of multiple assets into advanced interactive web based media.

DESN 220 3D Computer-Aided Design**3 Credits**

Prerequisites: None. This course will focus on 3D CAD features, including fundamentals of three-dimensional modeling for design. Includes overview of modeling, graphical manipulation, part structuring, coordinate system, and developing strategy of modeling.

DESN 221 Statics**3 Credits**

Prerequisites: MATH 121 or MATH 131 or MATH 134 or MATH 137. Studies applied mechanics dealing with bodies at rest without the use of calculus. Covers units, vectors, forces, equilibrium, moments and couples, planar force systems, distributed forces, analysis of structures, and friction.

DESN 222 Strength of Materials**3 Credits**

Prerequisites: DESN 221. Studies internal stresses and physical deformations caused by externally applied loads to structural members. Covers stress and strain, shear stress, properties of areas, shearing force and bending moment, deformation of beams, columns and combined stresses. Studies various materials' physical and mechanical properties.

DESN 223 Parametric Solid Modeling**3 Credits**

Prerequisites: None. This course builds upon previous CAD experience and focuses on solid modeling techniques and design intent utilizing parametric solid modeling CAD software. Students will use parametric CAD software to create solid geometry for individual parts, create assemblies from the individual parts and then produce engineering working drawings from the solid models. Topics include sketching, part modeling, and assemblies.

DESN 224 CAD Certification**1 Credit**

Prerequisites: DESN 113. Corequisites: DESN 225. Prepares the student for a CAD Professional exam. This course will thoroughly review and reinforce knowledge of the tools, features, and common tasks of CAD programs as assessed by the examination.

DESN 225 Portfolio Preparation**3 Credits**

Prerequisites: DESN 104, DESN 105, or Program Advisor Approval. Focuses on the student's final portfolio for graduation and preparation for the job interview. Finalizes design project work demonstrating the required knowledge and skills for degree achievements along with resume and cover letter preparation. A presentation for the portfolio is required in this class. Every student must submit a copy of the final portfolio for departmental archives upon graduation.

DESN 227 Geometric Dimensioning and Tolerancing**3 Credits**

Prerequisites: DESN 101. Introduces the fundamental principles of geometric dimensioning and tolerancing according to the latest ANSI standards. Students will apply geometric dimensioning and tolerancing symbols along with tolerances of form, profile, orientation, run-out, and location to mechanical problems.

DESN 228 Civil I**3 Credits**

Prerequisites: DESN 101 and MATH 122 or MATH 136 or MATH 137. Presents an overview of the basics of infrastructure related design topics, including the study of roadway and drainage systems. Emphasizes the preparation of drawings pertaining to infrastructure design and site development. Numerical calculations related to the design topics will be discussed.

DESN 229 Civil II**3 Credits**

Prerequisites: DESN 228. Presents advanced infrastructure related design topics, including highway structures, pavement types and geotechnical considerations. Emphasizes the preparation of drawings pertaining to various types of bridges. Drawing presentation of geotechnical site studies and pavement designs is also reviewed. Numerical calculations related to the design topics will be explained.

DESN 230 Computer Modeling and Animation**3 Credits**

Prerequisites: DESN 101. This course contains an historical overview of the development of computer-generated imagery, including CADD, computer animation, computer art and visualization. This course will cover various aspects of 3-Dimensional modeling, lighting, and camera placement, as well as compositional and design aspects for presentation. Computer animation techniques such as keyframing, inverse kinematics, and simulation will be introduced. The course also includes an overview of storyboarding, scene composition, and lighting.

DESM 232 BIM Design II**3 Credits**

Prerequisites: DESN 211. Presents the design and drawing of structures utilizing the Uniform Building Code (UBC). Focus is directed to structural systems and details of commercial or residential structures including wood, steel, and concrete. Applies Lessons learned from DESN 211 Structural Design in BIM Design I to new structure(s).

DESN 273 Design for Additive Manufacturing**3 Credits**

Prerequisites: DESN 104. This course is an introduction to additive manufacturing. Students will explore different types of additive manufacturing processes including prototype, 3D printing, and 3D scanning utilizing hands on applications. Additionally, students will use additive manufacturing software to manipulate designs. Students will also learn basic additive manufacturing safety, maintenance, and setup.

DESN 271 Introduction to Solidworks**3 Credits**

Prerequisites: DESN 113. Introduction of fundamental features of Solidworks design software and its major applications in industry. Students will acquire knowledge and skill of technical drawing creation, communication, and drawing management utilizing Solidworks.

DESN 272 Advanced Solid Modeling**3 Credits**

Prerequisite: DESN 220. This course covers the modeling of complex parts, complex surfaces, rapid prototyping, sheet metal parts, stress analysis, automatic bill of materials generation, and other advanced modeling techniques as time permits.

DESN 279 Design Technology Capstone**1 Credit**

Prerequisite: Program Chair Approval. This course provides students with the opportunity to develop a portfolio (digital and or hard copy), strong professional presence skills such as communication, networking, interviewing, and ethical problem solving. In this course, students will also take the CAAP (Collegiate Assessment of Academic Proficiency) exam.

DESN 280 Co-op/Internship**3 Credits**

Prerequisites: Program Advisor Approval. Gives students the opportunity to work at a job site that is specifically related to their career objectives. Provides on-the-job experience while earning credit towards an associate degree.

DHYG 101 Fundamentals of Dental Hygiene**2 Credits**

Prerequisite: Admission into the Dental Hygiene Program. Corequisites: DHYG 102, DHYG 103, DHYG 104, DHYG 105, DHYG 106, and DHYG 107. Introduction to the dental and dental hygiene profession, including principles of infection control, instrumentation, ergonomics, instrument design and fundamental dental hygiene skills (necessary to perform in subsequent courses). This course will have a corresponding lab to allow for application of principles learned in this course.

DHYG 102 Fundamentals of Dental Hygiene Clinic**2 Credits**

Prerequisite: Admission into the Dental Hygiene Program. Corequisites: DHYG 101, DHYG 103, DHYG 104, DHYG 105, DHYG 106, and DHYG 107. A study of the basic principles of infection control, instrumentation, instrument design, patient assessment and fundamental skills essential in patient assessment and treatment.

DHYG 103 Dental Radiography**2 Credits**

Prerequisite: Admission into the Dental Hygiene Program. Corequisites: DHYG 101, DHYG 102, DHYG 104, DHYG 105, DHYG 106, and DHYG 107. Comprehensive study of the principles of ionizing radiation and application of radiographic theory in dental hygiene practice. Radiation safety for operator and patient is emphasized.

DHYG 104 Dental Anatomy**2 Credits**

Prerequisite: Admission into the Dental Hygiene Program. Corequisites: DHYG 101, DHYG 102, DHYG 103, DHYG 105, DHYG 106, and DHYG 107. An in-depth course that focuses on the morphology, structure, and function of deciduous and permanent teeth and surrounding tissues.

DHYG 105 Nutrition and Oral Health

2 Credits

Prerequisite: Admission into the Dental Hygiene Program. Corequisites: DHYG 101, DHYG 102, DHYG 103, DHYG 104, DHYG 106, and DHYG 107. Introduction of the concepts of biochemistry and nutrition and their relationship to concepts in dentistry, health and disease and their application to the practice of dental hygiene.

DHYG 106 Oral Histology and Embryology

1 Credit

Prerequisite: Admission into the Dental Hygiene Program. Corequisites: DHYG 101, DHYG 102, DHYG 103, DHYG 104, DHYG 105, and DHYG 107. The study of histological and embryonic development of the head, face, and hard and soft tissues of the oral cavity to include developmental abnormalities.

DHYG 107 Head and Neck Anatomy

1 Credit

Prerequisite: Admission into the Dental Hygiene Program. Corequisites: DHYG 101, DHYG 102, DHYG 103, DHYG 104, DHYG 105, and DHYG 106. Anatomy and Physiology of the head and neck are studied with special emphasis on nerves, muscles and their attachments, bone structures, and functions of the oral cavity.

DHYG 110 Periodontology

2 Credits

Prerequisites: DHYG 101, DHYG 102, DHYG 103, DHYG 104, DHYG 105, DHYG 106, DHYG 107. Corequisites: DHYG 113, DHYG 114, DHYG 120, DHYG 121, DHYG 122. This course will include a study of the normal and diseased periodontium. The etiology and pathology of periodontal disease will be discussed to include the structural, systemic, functional and environmental factors that impact the disease process. Therapeutic and preventive periodontics including treatment modalities will be emphasized.

DHYG 113 Dental Radiography Clinic I

1 Credit

Prerequisites: DHYG 101, DHYG 102, DHYG 103, DHYG 104, DHYG 105, DHYG 106, DHYG 107. Corequisites: DHYG 114, DHYG 120, DHYG 121, DHYG 122, DHYG 110. Clinical application of principles and theories learned in DHYG 103, Dental Radiology. Exposure, processing and management of intra and extra oral radiographs.

DHYG 114 Dental Hygiene Clinic I

5 Credits

Prerequisites: DHYG 101, DHYG 102, DHYG 103, DHYG 104, DHYG 105, DHYG 106 and DHYG 107. Corequisites: DHYG 113, DHYG 120, DHYG 121, DHYG 122 and DHYG 110. Patient assessment, treatment planning, writing, and communicating of dental hygiene treatment plans. The implementation of various dental hygiene treatment modalities including information pertaining to patients with special needs.

DHYG 120 Pharmacology

2 Credits

Prerequisites: DHYG 101, DHYG 102, DHYG 103, DHYG 104, DHYG 105, DHYG 106, and DHYG 107. Corequisites: DHYG 113, DHYG 114, DHYG 121, DHYG 122, DHYG 110. A study of drugs with emphasis on the classification of drugs, their uses, actions, interactions, side effects, contraindications and oral manifestations. This course will also stress the dental applications of various drug classifications.

DHYG 121 Medical and Dental Emergencies

1 Credit

Prerequisites: DHYG 101, DHYG 102, DHYG 103, DHYG 104, DHYG 105, DHYG 106, and DHYG 107. Corequisites: DHYG 113, DHYG 114, DHYG 120, DHYG 122, and DHYG 110. The prevention, diagnosis and management of common medical emergencies in the dental setting.

DHYG 122 General Pathology

1 Credit

Prerequisites: DHYG 101, DHYG 102, DHYG 103, DHYG 104, DHYG 105, DHYG 106, and DHYG 107. Corequisites: DHYG 113, DHYG 114, DHYG 120, DHYG 121 and DHYG 110. Principles of general pathology, oral pathology and oral medicine related to etiology, progression, recognition and treatment of pathological conditions. Course content focuses oral manifestations of systemic diseases, and pathologic identification of infectious diseases.

DHYG 201 Community and Public Health Dentistry

2 Credits

Prerequisites: DHYG 204 and DHYG 228. Corequisites: DHYG 209, DHYG 222 and DHYG 224. A study of the principles and methods used in assessing, planning, implementing and evaluating community dental health programs. Topics include epidemiology, research methodology, biostatistics, preventive dental care, dental health education, program planning, and financing and utilization of dental services. Upon completion, students should be able to assess, plan, implement and evaluate a community dental health program.

DHYG 203 Dental Materials

2 Credits

Prerequisites: DHYG 204 and DHYG 228. Corequisites: DHYG 201, DHYG 209, DHYG 222, DHYG 224. Study of physical and chemical properties, identification, characteristics and manipulation of dental materials.

DHYG 204 Pain Management

2 Credits

Prerequisites: DHYG 113, DHYG 114, DHYG 120, DHYG 121, DHYG 122, and DHYG 110. Corequisites: DHYG 228. Provides the dental hygiene student with both the theoretical knowledge and the practical clinical skills to successfully perform the appropriate pain control measures to maintain patient safety and comfort. This includes the prevention and management of emergencies.

DHYG 209 Preventive Dentistry**1 Credit**

Prerequisites: DHYG 204, DHYG 228. Corequisites: DHYG 201, DHYG 203, DHYG 222, DHYG 224. Oral diseases and preventable conditions will be reviewed and evaluated in terms of their causes, assessment of individual risk factors, epidemiological distributions in populations, clinical detection, and evidence-based approaches to prevention. Preventive methods, including fluoride, sealants, mouth guards, and plaque control measures, will be discussed in terms of their utilization, effectiveness, method of delivery, and cost.

DHYG 222 Oral Pathology**2 Credits**

Prerequisites: DHYG 204 and DHYG 228. Corequisites: DHYG 201, DHYG 203, DHYG 209, and DHYG 224. The study of oral diseases, oral manifestations of systemic disease, and the processes of inflammation, wound healing, repair and immunological responses. Emphasis will be placed on the recognition of oral abnormalities and differential diagnosis of oral lesions.

DHYG 224 Dental Hygiene Clinic II**5 Credits**

Prerequisites: DHYG 204 and DHYG 228. Corequisites: DHYG 201, DHYG 203, DHYG 209, and DHYG 222. This course is a continuation of DHYG 228, Dental Hygiene Clinical. Procedures, with emphasis on the dental hygiene process of care. Students will incorporate advanced instrumentation techniques, radiographic procedures and pain management into dental hygiene care plans to provide comprehensive dental hygiene treatment for patients with advanced periodontal disease and special needs.

DHYG 228 Dental Hygiene Clinical Procedures**1 Credit**

Prerequisites: DHYG 110, DHYG 113, DHYG 114, DHYG 120, DHYG 121 and DHYG 122. Corequisite: DHYG 204. This clinical course will focus on the continued development and refinement of dental hygiene skills learned in DHYG 114. Incorporation of dental radiographs into the dental hygiene treatment plan will be included.

DHYG 230 Clinical Seminar**2 Credits**

Prerequisites: DHYG 201, DHYG 203, DHYG 209, DHYG 222, DHYG 224. Corequisites: DHYG 234, DHYG 235. This course will provide information related to ethics and jurisprudence, including a study of the state practice act. Practice management principles and employment opportunities for the dental hygienist will also be discussed. Developing a cover letter, resume writing, and interviewing will also be covered.

DHYG 234 Dental Hygiene Clinic III**6 Credits**

Prerequisites: DHYG 201, DHYG 203, DHYG 209, DHYG 222, and DHYG 224. Corequisites: DHYG 230, DHYG 235. Allows for the refinement of clinical skills and application of technology and current procedural practices of the dental hygienist with emphasis on self-evaluation and quality assurance. Students are also expected to demonstrate more efficient time management skills so they are prepared to enter the workforce.

DHYG 235 Community Oral Health Practicum**1 Credit**

Prerequisites: , DHYG 201, DHYG 209, DHYG 203, DHYG 222, DHYG 224. Corequisites: DHYG 234, DHYG 230. This course provides an opportunity for the dental hygiene student to apply principles learned in DHYG 201, and the present dental health information to various community groups and organizations. Project implementation and evaluation are included.

DMSI 100 Introduction to Sonography**1 Credit**

Prerequisites: Admission to the Diagnostic Medical Sonography Program. Students will learn the components of the ultrasound control panel, ergonomics, and proper scanning technique. They will also learn patient care considerations specific to sonography exams.

DMSI 101 Ultrasound Physics I**3 Credits**

Prerequisites: Admission to the Diagnostic Medical Sonography Program. This course will describe basic ultrasound physics to include the make-up and production of sound waves and their characteristics, as well as the interaction of the sound wave with different materials. The construction of the transducer how the sound beam is produced will be covered as well as the effects of the transducer on image resolution.

DMSI 102 Abdominal Sonography I**3 Credits**

Prerequisites: Admission to the Diagnostic Medical Sonography Program. Introduces and familiarizes the student with the basic anatomy and physiology related to abdominal sonography. The student will also learn to identify cross sectional and sonographic anatomy.

DMSI 103 OB/Gyn Sonography I and Lab**3 Credits**

Prerequisites: Admission to the Diagnostic Medical Sonography Program. This course will introduce to and familiarize the student with the basic pelvic and first trimester obstetric anatomy, physiology, and sonographic imaging.

DMSI 104 Vascular Imaging I**3 Credits**

Prerequisite: One year prior experience in the area of study. This course focuses on the performance and interpretation of noninvasive ultrasound vascular studies. Topics of study will include anatomy, physiology, hemodynamics of the vascular system, direct and indirect testing methods, B-Mode imaging, pulsed Doppler, spectral analysis, color flow Doppler, and preliminary interpretation. The anatomy, physiology, and pathology of the arterial and venous circulation systems and the imaging protocols and techniques for these systems will be covered in this course.

DMSI 105 General Sonography Clinical I

3 Credits

Prerequisites: Admission to the General Sonography Program. Content and clinical practice experience shall be assigned for sequential development, application, critical analysis, and evaluation of concepts and theories in the performance of general sonographic procedures. Through structured, sequential, competency based assignments in the clinical setting concepts of team work and patient care centered clinical practice and professional development will be examined and evaluated. Clinical practices are designed to provide the student with patient care and general sonographic exam experiences

DMSI 110 Vascular Sonography I and Lab

4 Credits

Prerequisites: Admission to the Vascular Sonography Program. This course will focus on the principles of hemodynamics and how disease affects these principles. There will be a study of the cerebrovascular system to include anatomy, physiology, and pathology.

DMSI 113 General Sonography Clinical II

3 Credits

Prerequisites: DMSI 105. Content and clinical practice experience shall be assigned for sequential development, application, critical analysis, and evaluation of concepts and theories in the performance of general sonographic procedures. Through structured, sequential, competency based assignments in the clinical setting concepts of team work and patient care centered clinical practice and professional development will be examined and evaluated. Clinical practices are designed to provide the student with patient care and general sonographic exam experiences.

DMSI 114 Vascular Sonography Clinical I

3 Credits

Prerequisites: Admission into the Vascular Sonography Program. This is the first of four rotations through various clinical sites to allow the student to acquire competency in the field of vascular sonography. During the first clinical rotation the student is required to use the knowledge acquired in the cognitive domain to display appropriate behavior in the affective domain. Knowledge from the cognitive domain gained last semester is also used as a foundation on which to build skills in the psychomotor domain. This is accomplished by scanning actual patients under controlled conditions.

DMSI 116 Vascular Sonography Clinical II

3 Credits

Prerequisites: DMSI 114. This is the second of four rotations through various clinical sites to allow the student to acquire competency in the field of vascular sonography. The student is required to use the knowledge acquired in the cognitive domain to display appropriate behavior in the affective domain. Knowledge from the cognitive domain gained last semester is also used as a foundation on which to build skills in the psychomotor domain. This is accomplished by scanning actual patients under controlled conditions.

DMSI 150 Vascular Sonography II and Lab

4 Credits

Prerequisites: DMSI 110. This course will continue to build on the principles learned in Vascular Sonography I. There will be a study of the upper and lower peripheral arterial system to include the anatomy, physiology, and pathology.

DMSI 201 Ultrasound Physics II

3 Credits

Prerequisite: DMSI 101. Designed to build on basic fundamentals of Ultrasound physics. The principles of Doppler, Image Formation, Quality Assurance, and Bioeffects are presented.

DMSI 202 Abdominal Sonography II

3 Credits

Prerequisites: DMSI 102. This course is a continuation of abdominal organs covered in Abdominal Sonography I. The urinary system, splenic, major vascular systems as well as the small part systems such as thyroid, breast, scrotum and musculoskeletal systems will be covered in this course. Pathology and the effects of different types of pathology as well as the sonographic appearance of organs affected will be discussed.

DMSI 203 OB/Gyn Sonography II and Lab

4 Credits

Prerequisite: DMSI 103. This course will continue to build on the knowledge acquired in OB/Gyn Sonography I and Lab along with learning pathologic indications and second and third trimester obstetric scanning.

DMSI 204 Vascular Imaging II

3 Credits

Prerequisite: One year prior experience in the area of study. This course will build upon concepts and studies of Vascular Imaging I and include focus on the performance and interpretation of noninvasive ultrasound vascular studies. Topics of study will include anatomy, physiology, hemodynamics of the vascular system, direct and indirect testing methods, B-Mode imaging, pulsed Doppler, spectral analysis, color flow Doppler, and preliminary interpretation. The anatomy, physiology, and pathology of the arterial and venous systems, concentrating on upper and lower extremity venous studies, and abdominal vascular studies, and the imaging protocols and techniques for these systems will be covered.

DMSI 205 General Sonography Clinical III

3 Credits

Prerequisites: DMSI 113. Content and clinical practice experience shall be assigned for sequential development, application, critical analysis, and evaluation of concepts and theories in the performance of general sonographic procedures. Through structured, sequential, competency based assignments in the clinical setting concepts of team work and patient care centered clinical practice and professional development will be examined and evaluated. Clinical practices are designed to provide the student with patient care and general sonographic exam experiences.

DMSI 206 General Sonography Clinical IV

3 Credits

Prerequisites: DMSI 205. Content and clinical practice experience shall be assigned for sequential development, application, critical analysis, and evaluation of concepts and theories in the performance of general sonographic procedures. Through structured, sequential, competency based assignments in the clinical setting concepts of team work and patient care centered clinical practice and professional development will be examined and evaluated. Clinical practices are designed to provide the student with patient care and general sonographic exam experiences.

DMSI 210 Vascular Sonography III and Lab

4 Credits

Prerequisites: DMSI 150. This course is a continuation of all of the principles and applications learned in Vascular Sonography I and II. Studies will include the upper and lower peripheral venous systems and the abdominal vascular system. These studies will include anatomy, physiology and pathology of these systems.

DMSI 214 Vascular Sonography Clinical III

3 Credits

Prerequisites: DMSI 116. This is the third of four rotations through various clinical sites to allow the student to acquire competency in the field of vascular sonography. The student is required to use the knowledge acquired in the cognitive domain to display appropriate behavior in the affective domain. Knowledge from the cognitive domain gained last semester is also used as a foundation on which to build skills in the psychomotor domain. This is accomplished by scanning actual patients under controlled conditions.

DMSI 216 Vascular Sonography Clinical IV

3 Credits

Prerequisites: DMSI 214. This is the last of four rotations through various clinical sites to allow the student to acquire competency in the field of vascular sonography. The student is required to use the knowledge acquired in the cognitive domain to display appropriate behavior in the affective domain. Knowledge from the cognitive domain gained last semester is also used as a foundation on which to build skills in the psychomotor domain. This is accomplished by scanning actual patients under controlled conditions.

DMSI 295 Sonography Exam Review

3 Credits

Prerequisites: All previous Sonography classes. Review of the concepts and principles taught throughout the program to include an emphasis on physics, anatomy and pathology. Mock examinations will be given in preparation for registry examinations through the American Registry for Diagnostic Medical Sonography.

ECED 100 Introduction to Early Childhood Education

3 Credits

Prerequisites: Must test into ENGL 095 or ENGL 093 and ENGL 083 to take this course. Entry level course for Early Care and Education teachers. It provides an overview of the history, theory, and foundations of early childhood education as well as exposure to types of programs, curricula and services available to young children. Opportunities to explore a variety of opportunities in the field through lecture, activities, and classroom observations. Students may be required to complete observations and field experiences with children as related to this course.

ECED 101 Health, Safety, and Nutrition

3 Credits

Prerequisites: Must test into ENGL 095 or ENGL 093 and ENGL 083 to take this course. Examines basic principles of child development, Developmentally Appropriate Practices (DAP), importance of family, licensing, and elements of quality care of young children with an emphasis on the learning environment related to health, safety, and nutrition. Entry-level course for early care and education teachers. Students may be required to complete observations and field experiences with children as related to this course.

ECED 103 Curriculum in Early Childhood Classroom

3 Credits

Prerequisites: Must test into ENGL 095 or ENGL 093 and ENGL 083 to take this course. Entry level course for Early Care and Education teachers. Examines Developmentally Appropriate environments and activities in various childcare settings. Explores the varying developmental levels and cultural backgrounds of children. Students may be required to complete observations and field experiences with children as related to this course.

ECED 105 CDA Process

3 Credits

Prerequisites: 480 hours of work experience with a specific age group (0-5 years) within the last five years, verification of 120 hours of required competency based coursework and Program Chair Approval. Prepares the student to complete the application, CDA exam, and verification process for the Child Development Associate (CDA) credential. Students participate in supervised visits at their practical work/volunteer sites as the college instructor fulfills the role of the Professional Development Specialist, as outlined by the Council for Professional Recognition. The college instructor completes site visits and observational assessments required for the credential process as outlined by the Council for Professional Recognition, Washington, D.C. Students may be required to complete observations and field experiences with children as related to this course. A credentialing fee is assigned to this course.

ECED 110 Infant/Toddler Growth and Development

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. Studies the physical, social, emotional, cognitive, and language development of infants and toddlers from conception through age three. Examines the crucial role of brain development and ecological systems during the first three years. Responsive care by adults is recognized as crucial to the development of the infants and toddlers. Quality child care is defined. Students may be required to complete observations and field experiences with children as related to this course.

ECED 111 Environments for Infants and Toddlers

3 Credits

Prerequisites: Must test into ENGL 093 and ENGL 083 to take this course. Examines environmental factors essential for providing quality infant toddler care and education. Discovers and assesses the various settings for infants and toddlers from the perspectives of quality and family issues. Community resources, and child advocacy efforts, and the importance of healthy human relationships are examined in relation to young children. Students may be required to complete observations and field experiences with children as related to this course.

ECED 120 Child Growth and Development

3 Credits

Prerequisites: ENGL 111. Studies the physical, social, emotional, cognitive, and moral development of children from conception to age twelve. Theories of child development, biological and environmental foundations, prenatal development, the birth process, and the newborn baby are discussed. Influences of family, community, media, and culture in various countries are considered. Students may be required to complete observations and field experiences with children as related to this course.

ECED 130 Developmentally Appropriate Guidance in a Cultural Context

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. Analyzes developmentally appropriate guidance, theory and implementation for various early care and education settings. Provide a basic understanding of the anti-bias/multicultural emphasis in the field of early childhood. Students may be required to complete observations and field experiences with children as related to this course.

ECED 200 Family-Teacher Partnerships

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. Examines the family/teacher partnership, recognizing the need to work as a team to enhance the child's development. Promotes awareness of the family as the child's first teacher, foundation, and framework for culture, language, attitudes, and values. Provides the structure for creating practices that establish active family participation. Explores issues and resources for families. Students may be required to complete observations and field experiences with children as related to this course.

ECED 201 Skills for Parenting

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. Focuses on skill development in parents that provides knowledge regarding healthy development in young children, building self-esteem, communicating with young children, setting appropriate boundaries and nurturing emotional and social development in children. Examines models of parent education, parenting styles, and the need for parent empowerment. Analyzes the effects of parent involvement in children's educational experiences. Students may be required to complete observations and field experiences with children as related to this course.

ECED 204 Families in Transition

3 Credits

Prerequisites: ENGL 111 and SOCI 111 or PSYC 101. Examines the make-up of today's diverse families and the multiple influences that impact children's development. Analyzes the importance of developing reciprocal relationships with families and communities in support of children's learning. Explores professional and ethical standards related to working with children and families, leading to informed advocacy for children, families and the profession. Students may be required to complete observations and field experiences with children as related to this course.

ECED 205 Early Care Practicum

3 Credits

Prerequisites: Program Chair Approval. Provides opportunity for practical experience through observation and supervised participation in childcare settings. This practicum offers experiences with age's infant through school age and requires 144 hours of field experience in an approved early care setting. Students may be required to complete observations and field experiences with children as related to this course.

ECED 210 Early Childhood Administration

3 Credits

Prerequisites: ENGL 111 and ECED 120 or demonstrated competency through appropriate assessment or earning a grade of "C" MATH 080. Introduces principles of managing an early care and education program; emphasizes the role of the manager to include personnel and program administration and fiscal management. Explores client-community relations. Students may be required to complete observations and field experiences with children as related to this course.

ECED 213 Infant and Toddler Programming

3 Credits

Prerequisites: ECED 110 or ECED 120. Studies the program planning and operation for quality infant and toddler care and education. The students examine the teacher's role in establishing positive and productive relationships with families. Exploration of essential skills and dispositions in managing an effective program are considered. The students will investigate appropriate instructional strategies to enhance infant/toddler development. Students will develop activities to enhance the physical, social, emotional and cognitive development of the child, 0-36 months. Students will complete observations and field experiences with children of this age. Students may be required to complete observations and field experiences with children related to this course.

ECED 216 Curriculum Planning for Early Childhood Administrators

3 Credits

Prerequisites: ENGL 111 and 12 credit hours of ECED coursework and program chair approval. Overview of cognitive and creative curriculum from a developmentally appropriate perspective. Examines early childhood curriculum models with an emphasis on planning and evaluating curriculum to meet the comprehensive needs of the young child. Course places emphasis on staff and family involvement in curriculum planning, implementation, and assessment. Students may be required to complete observations and field experiences with children as related to this course.

ECED 218 Leadership and Mentoring in Early Childhood

3 Credits

Prerequisites: ENGL 111 and 9 credit hours of Early Childhood Education coursework and Program Chair Approval. A basic introduction to the concept of leadership. Includes theories of leadership and teamwork and provides an opportunity for students to present a workshop to Early Childhood professional and to establish a relationship with a protégé. Students may be required to complete observations and field experiences with children as related to this course.

ECED 223 School Age Programming

3 Credits

Prerequisites: Must test into ENGL 093 and ENGL 083 to take this course. Examines environments, materials, methods and teaching styles for providing creative experiences for the school age child. Offers appropriate experiences in music, movement, art and drama as well as methods to assist students in identification and pursuit of specific personal interest areas in a school age child care setting. Review theories of adolescent growth and development, establishment of partnerships with families and positive guidance techniques for school age children. Students may be required to complete observations and field experiences with children as related to this course.

ECED 225 Infant Toddler Practicum

3 Credits

Prerequisites: Program Chair Approval. Provides opportunity for practical experiences through observation, assessment and supervised participation in an infant/toddler setting. Students develop, implement and assess appropriate environments and activities for children 6-36 weeks. Requires 144 hours of field experience. Students may be required to complete observations and field experiences with children as related to this course.

ECED 230 The Exceptional Child

3 Credits

Prerequisites: ECED 120 and ENGL 111. Provides an introduction to caring for each exceptional child. Includes theories and practices for producing optimal developmental growth. Develops teaching techniques and explores public policy including legislative mandates. Explores the types of special needs and provides methods for assistance. Students may be required to complete observations and field experiences with children as related to this course.

ECED 233 Emerging Literacy

2 Credits

Prerequisites: ECED 103 or EDUC 210 and ENGL 111. Provides for understanding of the development of children's language arts behaviors, concepts, and skills that precede and can develop into literacy, which includes reading and writing skills. Provides understanding and skills on how the acquisition of language for young children develops into optimum literacy growth through the materials and the environments that are provided for the young children. Students will explore and evaluate literature for young children. The course introduces technology materials and techniques, which are utilized in early childhood programs. In the course the students will research, examine and evaluate various screening and assessment tools related to literacy in the early childhood. Students may be required to complete observations and field experiences with children as related to this course.

ECED 235 Preschool Practicum

3 Credits

Prerequisites: Program Chair Approval. Provides opportunity for practical experience through observation and supervised participation in early care and education setting with children ages 3-5. Students will develop and implement developmentally appropriate environments and activities. Students may be required to complete observations and field experiences with children as related to this course.

ECED 243 Cognitive Curriculum

3 Credits

Prerequisites: ECED 103, ECED 120, and must test into MATH 080. Review cognitive theories of development in relation to the domains of early learning. Analyze appropriate problem solving, math, science, and social studies curriculum in early childhood settings. Create and implement curriculum in the domains of early learning utilizing appropriate child outcomes assessment. Reflect upon implementation of activities and assessment with children. Students may be required to complete observations and field experiences with children as related to this course.

ECED 245 School Age Practicum

3 Credits

Prerequisites: Program Chair Approval. Provides opportunities for practical experience through observation and supervised participation and assessment in a school-age setting. Students will develop and implement appropriate environments and activities. Requires 144 hours of field experience. Students may be required to complete observations and field experiences with children as related to this course.

ECED 255 Generalist Practicum

3 Credits

Prerequisites: Program Chair Approval. Provides opportunity for practical experience through observation and supervised participation and assessments in an early childhood setting. Students will develop and implement appropriate program plans and activities. Requires 144 hours of field experience. Students may be required to complete observations and field experiences with children as related to this course.

ECED 260 Early Childhood Professional

3 Credits

Prerequisites: Program Chair Approval. Surveys and further examines early childhood philosophies, theories and theorist. Encourages students to form their own theories for learning, discipline, family involvement, and self-concept development. Guides students in the development of a professional graduation portfolio. This is a capstone course and requires program chair approval.

ECED 281-294 Special Topics in Early Childhood Education

1-3 Credits

Prerequisites: Program Advisor Approval. Discuss topics of current interest in early childhood education. Identifies and offers various special topics during each term under this course number.

ECHO 101 Introduction to Echocardiography

3 Credits

Prerequisites: APHY 101, APHY 102, ENGL 111, and Advisor Approval and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 015 or MATH 023. This course focuses on cardiac anatomy, circulatory pathway, blood flow diagrams, cardiac pressures, cardiac murmurs, basic ECG concepts and chest roentgenography. Includes discussion of essential modes of echocardiography such as 2D, M-mode, Doppler, color flow Doppler and related hemodynamic calculations. Course emphasizes identification and description of normal cardiac structures in selected media including graphic illustrations, anatomic models, and ultrasound images.

ECHO 102 Adult Echocardiography I

3 Credits

Prerequisites: APHY 101, APHY 102, ENGL 111, and Advisor Approval and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 015 or MATH 023. Course emphasis on techniques utilized to perform a segmental adult echocardiogram, including explanation and practice in standard imaging planes and positions. Reviews normal cardiac anatomy for application in interpretation and categorizing basic cardiac pathophysiologies.

ECHO 104 Echocardiography Clinical I

5 Credits

Prerequisites: APHY 101, APHY 102, ENGL 111, and Advisor Approval and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 015 or MATH 023. Current CPR AHA Health Care Provider or equivalent; additional documentation for clinical affiliates as required. Provides practice in a clinical echocardiography laboratory setting. Learning environments will include critical care, emergency room, surgery, and cardiac telemetry units. Emphasis will be performance of adult echocardiograms with a trained cardiac sonographer, including essential patient care functions. Students will observe transesophageal, stress and contrast echocardiograms. Course includes required hospital orientation and 2 day electrocardiography course. Additional class fee for ECG course will apply.

ECHO 201 Advanced Professional Growth and Development

3 Credits

Prerequisites: ECHO 101, ECHO 102, ECHO 103, and ECHO 104. This course presents the role of the professional sonographer, including typical day-to-day responsibilities. Topics include maintaining proper scanning positions, lab setup, quality assurance, charging, ethics, patient confidentiality, safety and the significance of the team concept in contemporary healthcare settings. Capstone project emphasizes the essential role of life-long learning.

ECHO 202 Adult Echocardiography II

3 Credits

Prerequisite: ECHO 102. This course is a continuation of Adult Echocardiography I discussing pathophysiology commonly seen in the adult heart, including post operative findings such as prosthetic valves and heart transplantations, pacemaker wires, internal defibrillator wires, and central lines. Selected topics include identification and significance of tumors, missiles, myxomas, masses, contrast agents, and adult congenital heart diseases. Advanced ultrasound modalities such as 3D echocardiography, cardiac resynchronization therapy, and atrial septal defect closure devices will be discussed.

ECHO 203 Cardiac Physics and Instrumentation II

3 Credits

Prerequisite: ECHO 103. This course is a continuation of Cardiac Physics and Instrumentation I, emphasizing instrumentation variables, artifacts, and bioeffects.

ECHO 204 Echocardiography Clinical II

5 Credits

Prerequisite: ECHO 104. Provides additional supervised experience focused on development of skills to competently perform echocardiography procedures in adult patients, and assist cardiologists in various clinical environments. Rotations through other departments will include ECG, Cardiopulmonary Rehabilitation, Cath Lab, and the Operating Room for observation of selected cardiac surgical procedures. Observation and interaction with cardiologists during interpretation and dictation of echocardiograms is included. Continuing certification in CPR is required.

ECON 101 Economics Fundamentals

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. Provides a survey of microeconomics, macroeconomics, international economics, comparative economic systems, historical development of economic thought, and their application to current economic problems. An introductory course intended primarily for students who need only one semester of economics.

ECON 201 Principles of Macroeconomics

TransferIN 3 Credits

Prerequisites: ENGL 111 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or MATH 080. A descriptive and analytical study of fundamental concepts of national economics. It includes an analysis of the determination and fluctuations in national income and employment, monetary and fiscal policy, and international trade and finance. Economic analysis of monetary and fiscal policies is stressed.

ECON 202 Principles of Microeconomics

TransferIN 3 Credits

Prerequisites: ENGL 111 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or MATH 080. A descriptive and analytical study of the market economy and how it allocates resources. Emphasis is placed on consumer behavior, market structure, pricing, and distribution and determination of wealth and income. *Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.*

EDSN 101 Design Fundamentals

3 Credits

Prerequisites: None. Introduces theory and color dynamics as applied to compositional design. Includes exploration and application of three-dimensional concepts, human factors and the psychology and social influences of space.

EDSN 103 Introduction to Environmental Design

3 Credits

Prerequisites: EDSN 107 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 032 or ENGL 083. Corequisites: EDSN 107. An introductory course, which provides students with an overview of the field of environmental design. Exercises include small scale space analysis and functional planning based on user needs, application of the principles of design, furniture arrangement and selection, materials and finishes considerations and presentation techniques.

EDSN 104 Textiles for Interiors

3 Credits

Prerequisites: None. An intensive study of textiles from fiber sources identification and classification to finish and sustainable qualities. Also introduces the study of interior textile fabrications including window treatments, upholstery, carpet and wall coverings.

EDSN 107 Design and Construction Graphics

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment to meet MATH eligibility. Provides an understanding of conventional and green building practices, building structures, residential construction techniques, building materials and plan reading. Includes building codes, sustainable design practices, and the preparation of site and construction plans, elevations, sections, three-dimensional drawings details and hand renderings as they relate to construction and presentation drawings.

EDSN 108 Environmental Design and Space Planning

3 Credits

Prerequisites: EDSN 103 and EDSN 107. Presents concept development, programming and space planning of the built environment. Exercises reinforce creativity and problem solving skills. Emphasizes the relationship between individuals and their surroundings, including studies in human scale, proxemics and design considerations for special populations.

EDSN 115 Basic CAD for Environmental Designers

3 Credits

Prerequisites: EDSN 107. Introduces fundamentals of Computer-Aided Drafting (CAD) for environmental designers. Includes overview of CAD systems, use of software, and printer/plotter applications.

EDSN 182 Special Topics in Environmental Design

1-3 Credits

Prerequisites: Program Advisor approval. Discusses topics of current interest in introductory environmental design. Identifies and offers various special topics during each term under this course number.

EDSN 192 Special Topics in Environmental Design

1-3 Credits

Prerequisites: Program Advisor approval. Discusses topics of current interest in introductory environmental design. Identifies and offers various special topics during each term under this course number.

EDSN 200 Lighting and Building Systems

3 Credits

Prerequisites: EDSN 107. Presents the integration of commercial and institutional design and architectural detailing. Includes the environmental impact of mechanical and electrical systems, as well as acoustics and codes. Special emphasis will be placed on lighting technology and application.

EDSN 201 Materials and Finishes

3 Credits

Prerequisites: EDSN 107 and EDSN 103. Examines the physical properties and characteristics of furniture, materials, finishes, and architectural detailing. Addresses environmental issues and problems in specifying, estimating, and installing these materials.

EDSN 202 Contract Design **3 Credits**

Prerequisites: EDSN 108 and EDSN 115. Studies include commercial technological and base building requirements, sustainability and environmental impact, barrier-free, building and life safety codes, analysis of existing conditions, client interview, and square footage and space planning standards. Emphasis is on task analysis and workstation design, systems and equipment manufacturers and finish selections within the work environment. *Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.*

EDSN 203 Professional Practice **3 Credits**

Prerequisites: GRDN 114 or EDSN 103. Introduction to business principles and practices as they relate to the environmental design profession. Includes business formation and management, professional ethics and organizations, certification and licensing, design liability and project management. Students will identify key considerations for providing design services in a global marketplace.

EDSN 204 Advanced Environmental Design **3 Credits**

Prerequisites: EDSN 108 and EDSN 115. Students will define, research, and develop a program for an advanced design problem including concept development, space planning, all necessary working drawings and specifications and appropriate presentation materials. Project based on design specialty addresses specific populations, globalization, and sustainability.

EDSN 209 Portfolio Preparation **2 Credits**

Prerequisites: Program Advisors Approval. Efforts are directed toward achieving a career in environmental design in the global marketplace. Includes a comprehensive program assessment exam, the development of a quality portfolio and resume, and necessary field experience.

EDSN 282 Special Topics in Environmental Design **1-3 Credits**

Prerequisites: Program Advisor approval. Discusses topics of current interest in environmental design. Identifies and offers various special topics during each term under this course number.

EDSN 292 Special Topics in Environmental Design **1-3 Credits**

Prerequisites: Program Advisor approval. Discusses topics of current interest in environmental design. Identifies and offers various special topics during each term under this course number.

EDSN 210 History of Environmental Design **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 025 or ENGL 093 and ENGL 032 or ENGL 083. Survey of the historical development of the built environment and the interrelationship of interior design and decoration, architecture, garden, landscape, and community design from antiquity through the ages.

EDSN 211 Kitchen and Bath Design **3 Credits**

Prerequisites: EDSN 107 and EDSN 103. Involves the requirements and space planning for kitchens and baths, utilizing industry standards.

EDSN 212 Historic Preservation **3 Credits**

Prerequisites: Program Chair Approval. Introduces the process of establishing historic properties. Preservation, restoration and adaptive reuse will be differentiated as applied to both public and private properties. Includes appropriate exterior and interior color and finish selections, and architectural detailing.

EDSN 215 3-D Architectural Design and Rendering **3 Credits**

Prerequisites: EDSN 107. Reviews the fundamentals of Computer-Aided Drafting (CAD) for environmental designers. Includes overview of advanced architectural CAD systems and use of 3-D and rendering software.

EDSN 217 Visual Merchandising **3 Credits**

Prerequisites: EDSN 107. This course presents students with a survey of the many elements of visual merchandising and display currently used in retail design and decorative accessorization to attract customers. Students are introduced to the principles of retail space planning, fixture arrangement and the display equipment required in visual merchandising including fixtures, mannequins, signage, lighting and props. Includes research in marketing, color psych, and lighting. Field trips and hands-on projects are an integral part of the course.

EDSN 221 Kitchen and Bath Systems and Project Management **3 Credits**

Prerequisites: EDSN 107 and EDSN 103. A study of kitchen and bath systems including lighting systems, mechanical systems and HVAC. Presents an overview of project and construction management, including ethical business practices, the NKBA Standards of Conduct, Common Business contracts and NKBA business tools and forms.

EDSN 224 Travel Study **1-3 Credits**

Prerequisites: ENGL 111, Program Advisors Approval. This course offers the student an opportunity to research and explore the attributes of another country or region through world travel. Students will attend preparatory sessions on travel planning and management, research techniques, cross-cultural communications skills, study and observational methodologies, itinerary development, and post-trip summary, reflection, and application processes.

EDSN 233 Sustainable Design **3 Credits**

Prerequisites: EDSN 102 or EDSN 107. Introduces the fundamental principles in the ecological planning and development of the natural and built home and work environment. Presents the concepts of human impact on the environment through studies involving site selection and analysis, efficient space planning and building design, renewable and environmentally responsible construction methods, material selections and sustainable practices.

EDSN 280 Co-op/Internship **1-6 Credits**

Prerequisites: Program Chair Advisor's Approval. Students gain supervised career exposure, specifically related to career objectives. Provides on-the-job experience while earning course credit.

EDUC 101 Introduction to Teaching **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and/or ENGL 095. A course which provides a general introduction to the field of teaching. Students will explore educational careers, teaching preparation and professional expectations as well as requirements for teacher certification. Current trends and issues in education will be examined. A supervised observational experience component of a minimum of 20 hours is required for successful completion of this course.

EDUC 102 Introduction to Inclusive Teaching **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and/or ENGL 095. A course that provides an introduction to inclusive teaching. Students will explore the philosophy and rationale for inclusive teaching and best practices for the classroom teacher. Integration of all learners into the classroom community, promoting social and academic development and providing a safe and positive environment are examined in the course. A field experience of a minimum of 20 hours is required for successful completion of this course.

EDUC 103 Personal Health **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Introduces prospective teachers to the health issues children face. This course includes approaches to health appraisal, intervention strategies, and follow-up to health care issues for children. Special emphasis is placed on the physiological and psychological issues for children's health presented by AIDS, substance abuse, child abuse, eating disorders, suicide, and violence in the schools.

EDUC 105 Teaching Foundations and Classroom Management **3 Credits**

Prerequisites: Bachelor's Degree. This course is an overview of the teaching field and explains how to create a positive, caring classroom management plan for a secondary education classroom. Teachers at the secondary level have a broad and comprehensive understanding of student learning environments and demonstrate the ability to establish positive, productive, well-managed, and safe learning environments for all students.

EDUC 110 Understanding Art **3 Credits**

Prerequisites: None. Entry level course for students majoring in Education. This class offers students integrated lecture and lab opportunities that introduce elements and principles of art, basic art appreciation, the student's own creative development, and the student's creative expression through art. Students also examine the purposes and importance of the visual arts.

EDUC 121 Child and Adolescent Development **3 Credits**

Prerequisites: ENGL 111. Examines the physical, social, emotional, cognitive, and moral development of the child through adolescence with a focus on the middle years through adolescence. Basic theories of child development, biological and environmental foundations of development, and the study of children through observation and interviewing techniques are explored. The influence of parents, peers, the school environment, culture and the media are discussed. Up to 10 hours of observation/service learning may be required.

EDUC 200 Education and the Community **3 Credits**

Prerequisites: EDUC 101 or ECED 100 or EDUC 102. Introduction to instructional computing and educational computing literature. Provides hands-on experience with educational software, utility packages, and commonly used microcomputer hardware.

EDUC 201 Technology in Education **2 Credits**

Prerequisites: EDUC 101 or ECED 100 or EDUC 102. Introduction to instructional computing and educational computing literature. Provides hands-on experience with educational software, utility packages, and commonly used microcomputer hardware.

EDUC 210 Planning for the Elementary Education Classroom **3 Credits**

Prerequisites: Program Chair Approval. Provides opportunities for lecture and practical experience through observation and supervised participation and assessment in a school-age setting. Students will observe, develop, and implement direct teaching strategies as they relate to the organization of classroom instruction. Students will continue development of their digital portfolios.

EDUC 211 Best Classroom Practices in Teaching, Learning, and Assessment **3 Credits**

Prerequisites: Bachelor's Degree. This course examines the best classroom practices teaching, learning, and assessment. The course focuses on instructional planning and delivery and how to demonstrate the ability to plan and deliver standards-based, data-driven differentiated instruction that engages students, makes effective use of contemporary tools and technologies, and helps all students achieve learning goals. The process of curriculum development, lesson planning, assessment strategies, and using data to inform decision will also be examined.

EDUC 224 Introduction to Scientific Inquiry **3 Credits**

Prerequisites: EDUC 101 or EDUC 102. Provides the education major with background in the science process skills. Students will explore science through active participation and reflect on content, skills, and dispositions as a member of a learning community. Students will learn how to ask inquiry questions related to the natural world, plan investigations and formulate explanations.

EDUC 230 The Exceptional Child **3 Credits**

Prerequisites: EDUC 101 or EDUC 102 and ECED 120 or EDUC 121. Provides an introduction to teaching the exceptional child. Includes theories and practices for producing optimal developmental growth. Develops teaching techniques. Explores public policy, inclusion, early intervention, and IEP's (laws). Explores the types of special needs and provides opportunities through field experience to practice methods for helping children within special education and gifted/talented programs. Up to 20 hours of observation/service learning may be required.

EDUC 233 Literacy Development through Children's Literature **3 Credits**

Prerequisites: EDUC 101 or EDUC 102. This course examines children's literature for the preschool child through adolescence. Students will also study the relationship to literacy development. This course not only focuses on the traditional aspects of literacy but also examines other genres of literature (i.e. picture books, folk tales, poetry, short stories, historical and contemporary fiction, fantasy, biographies, and novels). Also, the benefits and rewards to literature will be discussed – enjoyment, aesthetics, comprehension strategies, imagination, cognition, language, multicultural integration, as well as, the development of the love of reading. Additionally, the role of art, illustrations, and media adaptations will be examined in conjunction with children's literature throughout the years. Students will also be introduced to literature awarded with the Newbery Award and Caldecott Medal distinctions.

EDUC 234 Literacy Development for Adolescents in the Content Area **3 Credits**

Prerequisites: Bachelor's Degree. This course examines adolescent literature and scientifically-based resources for middle/high school student. This course not only focuses on the traditional aspects of literacy but also examines other genres of literature and technical sources for the specific content areas. The benefits and rewards to literature will be discussed – enjoyment, aesthetics, comprehension strategies, imagination, cognition, language, multicultural integration, as well as, the development of the love of reading. Students will also be introduced to literature awarded with the Newbery Award and Printz Award distinctions.

EDUC 236 Driver Education Instructor Theory **3 Credits**

Prerequisites: Age 21 or over, valid driver license with no major convictions, medical clearance, cleared US criminal history. A three hour credit course that provides instruction on how to prepare new drivers. State regulated driver and traffic safety education classes provide the foundation for students, assisted by parents/mentors, to begin the lifelong learning process of reduced risk driving practices. Students acquire essential knowledge and dispositions experiences to perform reduced risk driving in varying traffic environments.

EDUC 237 Driver Education Instructor Methods **3 Credits**

Prerequisites: Age 21 or over, valid driver license with no major convictions, medical clearance, cleared US criminal history. A three hour credit course that provides instruction on the method for teaching new drivers. State regulated driver and traffic safety education classes provide the foundation for students, assisted by parents/mentors, to begin the lifelong learning process of reduced risk driving practices. Students acquire essential knowledge and disposition experiences to perform reduced risk driving in varying traffic environments.

EDUC 238 Driver Education and Instructor Practicum **3 Credits**

Prerequisites: EDUC 236. This three credit hour course is designed to provide the prospective driver education instructor with the knowledge and skills necessary to successfully conduct classroom and on-street instruction, provide a safe learning environment while doing so, and evaluate new driver performance.

EDUC 240 Introduction to Physical and Health Education for Elementary Teachers **3 Credits**

Prerequisites: EDUC 101 or EDUC 102. This course provides the elementary education major with a foundation in physical and health education. Knowledge and skills for planning and implementing health and physical education curriculum to promote physical fitness and healthy living for children Pre-K through 6th grade will be covered in the course. An observational experience is required for successful completion of this course.

EDUC 250 Educational Psychology **3 Credits**

Prerequisites: EDUC 101 or ECED 100 or EDUC 102 and ECED 120 or EDUC 121 and Program Chair Approval. Focuses on the study and application of psychological concepts and principles as related to the teaching-learning process. Topics covered include educational research methods, cognitive and language development, personal, social, and moral development, behavioral learning, motivation, effective teaching, and measurement and evaluation. Up to 20 hours of observation/service learning may be required. "This course may only be offered in face to face or hybrid formats."

EDUC 255 Multicultural Teaching

3 Credits

Prerequisites: EDUC 101 or EDUC 102. This course examines social and cultural conditions that influence education. The purpose is to assist students in understanding diversity and how to use this knowledge effectively within the schools and community. The course pursues an in-depth study of self, familial cultural heritage, and awareness of cultural differences in the United States and throughout the world. This course examines inclusive methods of teaching.

EDUC 261 Education Practicum

1-3 Credits

Prerequisites: Program Chair Approval. Provides opportunities for practical experience through observation and supervised participation and assessment in a school-age setting. Students will develop and implement appropriate environments and activities. Requires 144 hours of field experience.

EDUC 262 Mild Intervention Practicum

1-3 Credits

Prerequisites: Program Chair Approval. Provides opportunities for practical experience through observation and supervised participation and assessment in an inclusive elementary classroom, a resource setting, or combination. Candidates will relate principles and theories of education to teaching, including how to modify instruction and/or accommodate the needs of learners. Students will develop and implement appropriate environments and activities. This course requires 48-144 hours of field experience depending on the transfer institution. A service learning experiential component is required for successful completion of this course.

EDUC 270 Contemporary Issues in Education

3 Credits

Prerequisites: Program Chair Approval. Surveys and further examines educational philosophies, theories and theorists. Encourages students to form their own theories for learning, discipline, family involvement and self-concept development. Guides students in the development of a professional graduation portfolio.

EECT 101 Introduction to Electronics and Projects

3 Credits

Prerequisites: None. The material will concentrate on the physical world of electricity and electronics. Practical techniques for proper and safe use of basic hand and machine tools are introduced. Techniques for connecting various types of circuits are also covered. The process of fabricating printed circuit boards is presented. Communication skills are utilized to report project progress and results.

EECT 103 Soldering

1 Credit

Prerequisites: None. Students practice and develop skills soldering and desoldering through-hole and surface mount components. Students will use and maintain commercial grade solder/desolder stations. Students will be introduced to basic fabrication techniques.

EECT 111 Introduction to Circuit Analysis

4 Credits

Prerequisites: MATH 100 or MATH 122. Voltage, current, resistance, Ohm's law, Kirchhoff's laws, resistance combinations, and Thevenin's, Norton's, and superposition theorems are studied. DC and AC circuits are studied and utilized with basic AC terminology described. The performance of ideal transformers, capacitors and inductors, and first order RLC circuits are investigated. Fundamental analog electronic circuits are utilized in the lecture and laboratory to enhance the understanding of basic laws and theorems.

EECT 112 Digital Fundamentals

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 015 or MATH 023. Introduces basic gate and flip-flop logic devices and their application in combinational and sequential digital circuits. Topics include decoders, displays, encoders, multiplexers, demultiplexers, registers, and counters. Logic circuit analysis, implementation of circuits using standard IC chips or programmable logic devices, circuit testing and troubleshooting are emphasized.

EECT 121 Electronics Circuits Analysis

4 Credits

Prerequisites: EECT 111 and MATH 137. Capacitors, inductors, RC and RL switching circuits, transformers, rectifiers, linear voltage regulators, dependent sources, operational amplifiers, and BJT and MOSFET based small signal amplifiers are studied. Circuit fundamentals such as Ohms Law, Kirchhoff's laws and Thevenin's theorem are used to analyze and design circuits. Computer simulation is used.

EECT 122 Digital Applications

4 Credits

Prerequisites: EECT 112. This course continues study of combinational and sequential digital applications. The input and output characteristics of the various common logic families and the appropriate signal conditioning techniques for on/off power interfacing are discussed. Also stressed are standard logic function blocks, digital and analog signal interfacing techniques, and memory devices.

EECT 128 Introduction to C Programming

3 Credits

Prerequisites: EECT 112. An introduction to the "C" programming language. No programming experience is needed. After completing this course the students will have a good understanding of programming concepts, and terminology and should be able to pick up another programming language if interested. The course is designed to prepare students to use C to solve technical problems such as programming microprocessors.

EECT 130 Fiber Optics**3 Credits**

Prerequisites: EECT 121. Presents overview of fiber optics. Studies uses for fiber optics, advantages, cable details, connectors, splices, sources, detectors and fiber optic systems.

EECT 140 Networking**3 Credits**

Prerequisites: EECT 101. Study of types of protocols used in data communication systems. Includes an overview of networking, networking control, and interfacing. Areas of emphasis includes protocols, packet switching systems, local area networks, and the OSI model.

EECT 175 Introduction to Sustainable Electrical Energy**3 Credits**

Prerequisites: EECT 101. This course is a comprehensive introduction to Sustainable Electrical energy sources and their control systems. Topics include photovoltaic, solar thermal systems, green buildings, hydrogen fuel-cells, wind power, nuclear energy and hydroelectric. This course will compare and contrast existing and potential alternative energy sources, storage techniques and the systems to control them using new and traditional energy generation methods and by reviewing typical energy consumption patterns. Key concepts, terminology, definitions, and nomenclature common to all energy systems introduced. Students may take the course as an elective in electronics technology, design technology, industrial technology, mechanical engineering technology, and related technologies.

EECT 204 Electrical Energy Management (Smart Grid)**3 Credits**

Prerequisites: EECT 175. This course introduces energy management (Smart Grid) systems and their control. Energy management means efficiently integrating photovoltaic systems, solar thermal systems, green buildings, fuel cells, wind power, nuclear energy and hydroelectric power into the electrical grid. The course covers existing and alternative energy sources, storage techniques, monitoring, analysis, control and communication systems for electrical power delivery. ZigBee controls and communications will be covered.

EECT 209 Industrial Computer Controls I**3 Credits**

Prerequisites: EECT 101 or EECT 111, and EECT 112. Corequisites: EECT 112. An introduction to the field of industrial controls as it relates to a computer control systems, process control and industrial networking. Covers the principles of control systems as applied to a production system to achieve automation. PLC's will be covered as the mainstay of industrial computer control. Troubleshooting of production control systems are covered.

EECT 210 Industrial Computer Controls II**3 Credits**

Prerequisites: EECT 209 or Instructor Approval. Serves as an introduction to the field of industrial controls. Students will learn the principles of control systems and how they are applied to a production system to achieve automation. Systems included in the courses are stepper motors, programmable logic controllers, microprocessors, instruments with feedback systems, terminal panel, and remote. Emphasis is placed on programmable logic controllers, safety and the local area network. Structured text programming will be introduced.

EECT 211 AC Circuit Analysis**3 Credits**

Prerequisites: EECT 121 and MATH 137. AC circuits, including the j operator, phasors, reactance, and impedance are studied. Circuit laws, network theorems, and the fundamental concepts of Fourier analysis are applied and used in the study of topics such as passive filters, IC filters, amplifiers, resonant circuits, single phase and three phase circuits. Computer aided analysis of circuits is used.

EECT 213 Introduction to Industrial Controls**3 Credits**

Prerequisites: EECT 121 and EECT 223. Studies basics of controls related to industrial electronics. Includes basic and pilot control devices such as circuit layouts, industrial schematics, reduced voltage starters, multispeed controllers, and solid-state controls. Covers transformer hookups and circuit protection.

EECT 214 Industrial Instrumentation**3 Credits**

Prerequisites: EECT 111. Provides a system view of manufacturing and automated production emphasizing the devices used in control and measurements. Areas covered include pressure, strain, force, flow, and level considerations. Principles of process control are introduced, incorporating the usage of probes, sensors, transducers, and various final control devices. Computer software, hardware, and interfacing are examined in regards to data acquisition, manufacturing control, and summarization of industrial data.

EECT 219 Biomedical Electronics I**3 Credits**

Prerequisites: APHY 101 or BIOL 100 and HLHS 101 and EECT 126. Offers study of medical electronics equipment, including ECG, EEG, defibrillators, heart monitors, monitoring and respiratory equipment.

EECT 220 Biomedical Electronics II**3 Credits**

Prerequisites: EECT 219. Studies medical support systems including X-ray equipment, respirators and analyzers, and their maintenance. Studies medical ultrasound, electro surgery units and mechanical recorders. Prepares students for licensing and certification.

EECT 221 Solid State**3 Credits**

Prerequisites: EECT 121. Continues the study of bipolar transistors with additional circuit configurations including the emitter follower and the Darlington. Studies power amplifiers, amplifier classifications, unipolar transistors, and thyristors. Includes discreet FETs, SCRS, UJTs, oscillators, linear regulated power supplies, and switching regulators. Discusses frequency effects and response of amplifiers.

EECT 222 Introduction to Microcontrollers

4 Credits

Prerequisites: EECT 122 and EECT 128. An introduction to microcontroller hardware and software, focusing on embedded control applications. Interconnections of components, peripheral devices, bus timing relationships, structured C-language programming, debugging, input/output techniques, and use of PC-based software development tools are studied.

EECT 223 Electrical Machines

3 Credits

Prerequisites: EECT 121. Provides an overview of electrical machines and how they relate to industrial electronics. Gives students insight into electrical power generation, polyphase systems, transformers, all types of electrical motors, power factor and power factor correction, back-up power and electrical power monitoring.

EECT 226 Computer Troubleshooting

3 Credits

Prerequisites: EECT 112. A study of techniques for logical troubleshooting of microcomputer systems. Emphasizes basic system components including power supplies, motherboards, memory, floppy and hard disk drives, operation of video displays, and keyboard and mouse connections. Emphasizes system-oriented troubleshooting procedures.

EECT 228 Communications Electronics

3 Credits

Prerequisites: EECT 121. Analyzes communication circuits with emphasis on AM, FM, SSB, transmitters and receivers, transmission lines, antennas, and wave propagation. Includes dB gain and attenuation, noise, modulation and demodulation principles, phase-locked loop, RF amplifiers, automatic gain control, detectors, limiters and discriminators. Offers hands-on lab exposure to analog circuits utilizing analysis and troubleshooting techniques.

EECT 229 Telecommunications and Networks

3 Credits

Prerequisites: EECT 111 and EECT 113. Covers communications of digital information used in telephony, TV, and the Internet. Includes discussion of analog RF, A/D conversion, modulation schemes, and information theory. Considers network topology, cellular service, wireless networks, Internet, devices, and software. Issues include error detection/correction, security, reliability, and network configuration.

EECT 230 Advanced Communications Electronics

3 Credits

Prerequisites: EECT 228. The basics of antenna principles and wave propagation together with an in-depth study of matching techniques for transmission lines. Includes the Smith Chart and a thorough study of television operation. Radiation patterns will be measure with different antenna arrays. Signal tracing troubleshooting techniques will be practiced on a color TV set.

EECT 232 Advanced Computer Troubleshooting

3 Credits

Prerequisites: EECT 226. To provide an opportunity for students to obtain the knowledge and skills necessary to install, learn to use, and to troubleshoot all major operating systems, as well as prepare for a successful result on the CompTIA A+ Operating System exam.

EECT 233 Industrial Motors and Controls

3 Credits

Prerequisites: EECT 111. Provides a complete understanding of basic ladder and wiring diagrams used in the control of electric motors. Includes the various electrical components and their functions as applied to motor controls. Topics include the various types of motors used in applying electro-mechanical power, ranging from small AC shaded-pole fan motors through larger three-phase motors. Motor starting components, protective devices, heat dissipation, motor slippage and frequency and multispeed motors are discussed. Lab assignments allow the student a hands-on approach to wiring various control components in the operation of three-phase motors.

EECT 235 Process Control

3 Credits

Prerequisites: EECT 121. Presents an in-depth view of process control theory and applications. Topics covered are open and closed loop systems, feedback concepts, signal conditioning, standards and terminology, controller principles and loop characteristics. Concepts of thermal, mechanical, optical sensor devices are emphasized as measurement control. Transducers and final control actuators are examined.

EECT 237 Calibration

3 Credits

Prerequisites: EECT 121. Provides an introductory overview of procedural calibration for instruments (electronic and pneumatic) found in today's controlling environments and industry. Instrument evaluation, installation, and calibration are the emphasis for this course. Dismantling and calibration of DP cells, gauges, valve positioners, thermocouple circuits, control elements, and other industrial instruments are incorporated throughout the course.

EECT 238 Process Instrumentation

3 Credits

Prerequisites: EECT 121. Presents the concepts and fundamentals of measurement instrumentation and its application to industrial process control. Introduces basic device symbols and instrumentation terminology. Includes measurement principles and techniques involving temperature, pressure, flow, level, displacement, strain, load, torque, vibration, humidity, density/specific gravity, gas analysis, and conductivity. Discusses open versus closed loop control and the application of combinations of proportional, integral, and derivative control methods. Includes chart.

EECT 279 Advanced Problem Solving **3 Credits**

Prerequisites: EECT 121 and EECT 122. Introduces logical troubleshooting of electronic circuits and systems with emphasis on systematic diagnostic methods and technical reference research. Provides further experience in the use of test equipment and proper repair techniques. Includes job preparedness skills and preparation for appropriate certification testing.

EECT 280 Co-Op/Internship **3 Credits**

Prerequisite: Program Advisor Approval. Gives students the opportunity to work at a job site that is specifically related to their career objectives. Provides on-the-job experience while earning credit towards an associate's degree.

EETC 221 Electrical Power and Controls **4 Credits**

Prerequisite: EECT 121 and PHYS 101. The introduction of magnetic materials is followed by analysis of transformers and power conditioning equipment. Also covered are induction motors and single phase and three-phase systems. Motor control devices, programmable logic " controllers, PLC input and output devices, and power systems communications and monitoring are introduced.

EETC 223 Power and RF Communications **4 Credits**

Prerequisite: EECT 121 and MATH 221. This course is a study of the application of circuit analysis techniques to amplifiers used in power and RF electronics, including bipolar junction transistors, power MOSFETs, thyristors, RF amplifiers, phase lock loops, switching power supplies, and appropriate applications. Computer-aided analysis of circuits is used.

EETC 225 Electronic Prototype Development **4 Credits**

Prerequisite: EECT 101 and EECT 122. Basic concepts in the development of an electronic prototype are covered. The student utilizes electronic design automation, design for testing, surface mount technology, design for manufacturability, component characteristic selection techniques, and basic failure predictions. The final prototype is presented in a written and /or oral report.

EETC 279 EE Capstone **1 Credit**

Prerequisites: Program Advisor Approval. Prepares the student for the CETI exam and entry into Electrical Engineering Technology by reviewing procedures for job interviewing and team participation. Provides a platform for taking the program outcome assessments.

ENGL 007 Spelling **1 Credit**

Prerequisites: None. Improves basic spelling competencies through practice and attention to spelling rules and exceptions.

ENGL 083 Reading Strategies for College **3 Credits**

Prerequisites: IVYT 101 or IVYT 120 and demonstrated competency through appropriate assessment. Corequisites: IVYT 101 or IVYT 120. Prepares students for the demands of reading in a variety of college-level courses through improved reading flexibility, vocabulary, and comprehension. Emphasizes critical reading strategies.

ENGL 093 Introduction to College Writing **3 Credits**

Prerequisites: IVYT 101 or IVYT 120 and demonstrated competency through appropriate assessment. Corequisites: IVYT 101 or IVYT 120. Focuses on paragraph and essay writing. Prepares students for the demands of writing in a variety of college-level courses. Provides students with the necessary skills to compose focused, organized, and well-developed expository writings on a number of topics. Requires students to revise their work according to standard writing conventions, including style, grammar, and mechanics. Introduces the process of research. Includes writing assignments that introduce and require the use of MLA and APA documentation styles.

ENGL 095 Integrated Reading & Writing **3 Credits**

Prerequisites: IVYT 101 or IVYT 120 and demonstrated competency through appropriate assessment. Prepares students for the demands of reading and writing in a variety of college-level courses. Cross disciplinary materials are used in an integrated approach to reading, writing, and critical thinking.

ENGL 111 English Composition **TransferIN 3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. English Composition is designed to develop students' abilities to think, organize, and express their ideas clearly and effectively in writing. This course incorporates reading, research, and critical thinking. Emphasis is placed on the various forms of expository writing such as process, description, narration, comparison, analysis, persuasion, and argumentation. A research paper is required. Numerous in-class writing activities are required in addition to extended essays written outside of class. ***Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.***

ENGL 112 Exposition and Persuasion **TransferIN 3 Credits**

Prerequisites: A grade of "C" or better in ENGL 111. Builds on the writing skills taught in ENGL 111 and emphasizes research-based analytic and argumentative writing. ***Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.***

ENGL 202 Creative Writing

TransferIN 3 Credits

Prerequisites: ENGL 111. This course introduces students to opportunities for self-expression in one or more literary genres - fiction, poetry, drama, and the creative essay.

ENGL 203 Advanced Creative Writing

3 Credits

Prerequisites: ENGL 202. This course offers students advanced opportunities for self-expression in one or more focused literary genres - fiction, poetry, drama, or creative nonfiction.

ENGL 206 Introduction to Literature

TransferIN 3 Credits

Prerequisites: ENGL 111. Development of basic strategies for critically reading and interpreting poetry, fiction, and drama; introduction to the premises and motives of literary analysis and critical methods associated with various literary concerns through class discussion and focused writing assignments.

ENGL 210 Literature and Life: Thematic

3 Credits

Prerequisites: ENGL 111. A thematic introductory literature course. Students will read American and/or English literature in relation to a specific cultural problem or theme. Students will be introduced to critical/ literary approaches, draw conclusions about similarities and differences between texts (both in terms of content and technique), and practice written response to the texts.

ENGL 211 Technical Writing

TransferIN 3 Credits

Prerequisites: A grade of "C" or better in ENGL 111. Builds on the writing skills taught in ENGL 111. Requires students to prepare technical reports and correspondence for various purposes using standard research techniques, documentation, and formatting as appropriate. May require students to demonstrate both written and oral competencies.

ENGL 214 Introduction to Poetry

TransferIN 3 Credits

Prerequisites: ENGL 111. Provides introduction to the art and history of poetry. Emphasizes a greater appreciation and understanding of the genre through critical analysis of poetic forms and literary devices.

ENGL 220 World Literature I

TransferIN 3 Credits

Prerequisites: ENGL 111. Introduces students to influential world literature from ancient times through the mid-17th century. Included will be a discussion of the major historical, cultural, intellectual, and political events that shaped this literature. Students will analyze and evaluate classical world literature with respect to themselves and also analyze and evaluate world literature in relation to global problem-solving/ decision-making. ***Students who apply to and are admitted in to the American Honors Program at Ivy Tech, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.***

ENGL 221 World Literature II

TransferIN 3 Credits

Prerequisites: ENGL 111. World Literature II introduces students to influential world literature from the mid-17th century through present times. Included will be a discussion of the major historical, cultural, intellectual, and political events that shaped this literature. Students will not only analyze and evaluate classical world literature with respect to themselves but also analyze and evaluate world literature in relation to global problem-solving/decision-making.

ENGL 222 American Literature to 1865

TransferIN 3 Credits

Prerequisites: ENGL 111.. American Literature to 1865 surveys major American writers from the early Colonial period through the Civil War. Included will be discussions of the major historical, cultural, intellectual, and political events that influenced the authors.

ENGL 223 American Literature After 1865

TransferIN 3 Credits

Prerequisites: ENGL 111. American Literature after 1865 surveys major American writers from the Civil War to the present. Included will be discussions of the major historical, cultural, intellectual, and political events that influenced the authors.

ENGL 224 British Literature to 1800

3 Credits

Prerequisites: ENGL 111. Introduces the student to British literature from Beowulf to the eighteenth century. Included will be a discussion of the major historical, cultural, intellectual, and political events which influenced the development of British literature.

ENGL 225 British Literature After 1800

3 Credits

Prerequisites: ENGL 111. Introduces the student to British literature from the Romantic, Victorian, and modern periods. Included will be a discussion of the major historical, cultural, intellectual, and political events which influenced the development of British literature.

ENGL 227 World Fiction

3 Credits

Prerequisites: ENGL 111. This general survey course introduces the genre of fiction through a focus on world authors. It examines themes and literary devices present in novels and short stories.

ENGL 240 Children's Literature**TransferIN 3 Credits**

Prerequisites: ENGL 111. This course provides a survey and analysis of classic and modern children's literature for students interested in understanding literature read to/by children preschool-middle school. The course focuses on different genres of literature and may include picture books, folk tales, poetry, short stories, and novels. In addition, the role of art, illustrations, and media adaptations will be examined in conjunction with children's literature throughout the years.

ENGL 245 Literature of the Old Testament**3 Credits**

Prerequisites: ENGL 111. Surveys the Old Testament/Hebrew Scripture as a literary work. Emphasizes history, composition, structure, cultural context, and recognizing the contribution it has made to human development.

ENGL 249 Linguistics**TransferIN 3 Credits**

Prerequisites: ENGL 111. Designed to introduce students to the various disciplines which comprise the scientific study of language. These include a survey of applied, comparative, descriptive, and historical linguistics. The course will primarily focus on the English language.

ENGL 250 English Grammar**3 Credits**

Prerequisites: ENGL 111. An in-depth study of the grammatical structures of American English. A course designed to acquaint students with descriptions of modern English syntax.

ENRG 113 Energy Storage**3 Credits**

Prerequisite: None. This course is an introduction to energy storage systems. It will cover a variety of chemical battery storage systems as well as hydroelectric storage, compressed air energy storage, flywheels, electrochemical capacitors, superconducting magnetic energy storage, thermal energy storage, fuel cells, and molten salt energy storage. Topics include exploring the future of battery storage and smart grid systems. The course will not only cover renewable energy technologies but also traditional energy markets and their need for energy storage.

ENGR 116 Geometric Modeling for Visualization**2 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 100. This is a fundamental course which introduces students to geometric modeling for visualization and communication. Modeling construction techniques to produce computer models for graphic visualization and communication will be explained and used.

ENGR 140 Engineering Software Tools I**3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or successful completion of MATH 136 and MATH 137. This course introduces the students to the engineering profession, and to computer programming. The programming techniques will be introduced which is applicable to all computer languages. The C++ programming language will be introduced. Examples and engineering applications will be used to illustrate programming concepts.

ENGR 160 Engineering Software Tools II**3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or successful completion of MATH 136 and MATH 137. Introducing students to object-oriented programming and design. Emphasis on engineering application.

ENGR 190 Introduction to Engineering Design**2 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or successful completion of MATH 136 and MATH 137 or MATH 211. This introductory course provides the student an opportunity to be introduced with fundamentals of the design process from mechanical and electrical aspects.

ENGR 195 Introduction to the Engineering Profession**1 Credit**

Prerequisites: None. Provides an introduction to the engineering profession and to campus resources. The course is designed to help students develop essential communication and thinking skills along with the study and time-management skills needed for success in studying engineering. Collaborative techniques used in engineering practice are utilized.

ENGR 196 Introduction to Engineering**3 Credits**

Prerequisites: MATH 136 and MATH 137. This course provides an overview of the engineering profession and methodologies of engineering design. Students develop skills using computer aided design (CAD) and simulation software for engineering systems. Team projects and homework are implemented and tested in a laboratory environment. The course also introduces the students to standard computer application software.

ENGR 197 Introduction to Programming Concepts**2 Credits**

Prerequisites: MATH 136 and MATH 137. Introduces basic concepts and applications of software programming for solving engineering problems. Topics include: techniques for developing structured algorithms, data input and output, conditional statements, loops, recursion, functions, arrays and elementary concepts in mathematical programming. Examples, homework, and applications of programming concepts make extensive use of the C++ programming language.

ENGR 200 Thermodynamics**3 Credits**

Prerequisite: PHYS 220. Corequisite: Math 261. Introduces thermodynamic fundamentals such as the first and second laws, entropy, reversible and irreversible processes, properties of pure substances, and provides for application to practical engineering problems.

ENGR 204 Introduction to Electrical and Electronic Circuits**4 Credits**

Prerequisite: PHYS 221. Introduces basic electrical and electronic concepts, including both analog and digital circuits. Measurements of electrical signals using meters, probes, and oscilloscopes are covered in the laboratory. Circuits are designed for minimum hardware with emphasis on understanding analog and digital electronics and practical use of digital and analog chips. This course is intended for non-electrical majors (such as mechanical and energy engineering) and is not part of the electrical or computer engineering majors.

ENGR 251 Electrical Circuits I**4 Credits**

Prerequisites: MATH 212. Provides an integrated lab/lecture sequence in which students are introduced to the fundamentals of circuit analysis. Topics include resistive, capacitive, and inductive circuit elements, nodal and mesh analysis, transient response of RLC circuits, steady state sinusoidal response, operational amplifiers, and an introduction to diodes and transistors.

ENGR 252 Electrical Circuits II**4 Credits**

Prerequisites: ENGR 251. An integrated lab/lecture course which continues ENGR 251. This course covers sinusoidal steady state analysis, Laplace and Fourier analysis, transistors, diodes, op-amps, and three-phase systems. An introduction to computer aided design and analysis is provided.

ENGR 260 Vector Mechanics-Statics**3 Credits**

Prerequisites: MATH 212. Includes resolution and composition of forces, moments, principles of equilibrium and application to trusses and jointed frames, friction, center of gravity and second moments of areas. Uses vector analysis throughout.

ENGR 261 Dynamics**3 Credits**

Prerequisites: ENGR 260. Covers rectilinear and curvilinear motions, force, mass and acceleration, projectiles, pendulums, inertia forces in machines, work and energy, impulse and momentum and impact.

ENGR 263 Introduction to Computing in Electrical Engineering**4 Credits**

Prerequisites: ENGR 196. Introduces basic concepts of computer programming with an emphasis on program decomposition and program structure. Focuses on structured problem-solving using the C high-level programming language. Covers number concepts fundamental in electrical engineering. Problems drawn from the field of electrical and computer engineering will require no prior engineering knowledge.

ENGR 270 Engineering Project Management**3 Credits**

Prerequisites: After 45 credit hours in the program. An introduction to principles of engineering project management and techniques. Topics include technical feasibility studies, project specifications, scheduling, validation, life cycle costing, and economic analysis. The focus is on managing an engineering project through scheduling, budgeting, resource management, execution and control.

ENGR 272 Introduction to Digital Logic Design**4 Credits**

Prerequisites: ENGR 251. Introduces digital devices and their applications in combinational and sequential circuits. Provides instruction in methods of design of digital circuits and systems. Topics include binary arithmetic, Boolean algebra, K-maps, programmable logic, decoders, displays, encoders, multiplexers, demultiplexers, latches, flip-flops, registers, and finite state machines. Computer-Aided-Design programs are used to design, simulate, and optimize circuits.

ENGR 279 Capstone Course**1 Credit**

Prerequisites: 45 Credit hours plus Program Advisor Approval. Prepare the student for articulation into a related baccalaureate Engineering program at a four year institution. The student will prepare for, and take, the Outcomes Assessment Exam for the Pre-Engineering program. In this exam, the student must demonstrate his/her competency in the core learning subjects of the Pre-Engineering program. These subjects include chemistry, mathematics, physics, communications, computer science and engineering.

ENGR 297 Computer Tools for Engineering (Matlab)**1 Credit**

Prerequisites: ENGR 197, or ENGR 263, or CSCI 102. Provides engineering students with the basic concepts and applications of software programming for solving engineering problems using MATLAB.

ENGT 120 Engineering Concepts in Technology**3 Credits**

Prerequisites: None. This entry-level course will develop a student's perspective and enhance their skills in living and working in a technological society. The course explores the design process, problem solving, technical communication, ethics, the impact of technology, and technology grand challenges facing the global society.

ENGT 279 Portfolio Preparation

2 Credits

Prerequisites: Program Advisor Approval. Focuses on the student's final portfolio for graduation. Requires collection and organization of all engineering technology course work into a portfolio, with overview documentation relating different disciplines and tying the coursework together. Creation of overview and synthesis is major emphasis of class with the portfolio as the base document. Every student must submit a copy of the final portfolio for departmental archives upon graduation.

ENRG 100 Energy Industry Fundamentals

3 Credits

Prerequisites: None. Energy Industry Fundamentals provides a broad understanding of the electric and natural gas utility industry and the energy generation, transmission, and distribution infrastructure, commonly called the "largest machine in the world," which forms the backbone for the industry. The course includes business models, regulations, types of energy and their conversion to useable energy such as electric power, how generated power is transmitted and distributed to the point of use, emerging technologies and the connection to careers in the energy industry.

ENRG 101 Introduction to the Energy Industry

1 Credit

Prerequisites: None. This course introduces the student to the energy industry. Students will visit various energy utilities, such as: a power plant, a switchyard, a substation, a natural gas regulator station, welding facilities, ethanol plants, biodiesel plants, and other renewable energy sites.

ENRG 102 Climbing

3 Credits

Prerequisites: None. The student will gain the knowledge of the proper care of climbing tools, and the mastering of climbing wood pole structures. The student must master climbing wood pole structures with and without the use of a pole safety strap. Upon completion of this course the student will also be able to determine the proper aspects of pole inspection, and be able to recognize the hazards of climbing. Upon successful completion of this course, the student will be qualified in two methods of pole top rescue. An introduction to aerial pole framing is included in this discipline.

ENRG 103 Electrical Essentials for Power Line Workers

3 Credits

Prerequisites: INDT 113 or ADMF 113. An introduction to the electrical principles required for installation, maintenance and troubleshooting of power line. Topics include electrical units, power systems overview, ac current and voltage, single and three phase circuits, conductors and cables, transformers, grounding, protective equipment.

ENRG 107 Transmission and Distribution of Electric Power

3 Credits

Prerequisites: INDT 113 or ADMF 113. A study of the principles and components required for the transmission and distribution of electric power. To provide the student with an understanding of high voltage systems, single and three phase circuits, voltage regulation, power grids. Overhead and underground distribution. Safety, buying and selling of power.

ENRG 109 Rigging for Line Workers

3 Credits

Prerequisites: ENRG 102. The student will gain the knowledge of rigging gear inspection, safe rigging procedures and load control, using almost any vertical or horizontal rigging system. Students will tie knots. Splice rope, install block and lines or power lines for hoisting purposes, as well as calculate hook strain and haul line tension for safe working loads. Wire and chains will also be covered.

ENRG 111 Smart Grid Home Integration

3 Credits

Prerequisites: None. This course teaches cost saving energy technologies. Topics include reducing home energy consumption by eliminating heat loss and heat transfer. Using smart grid technologies energy conservation is maximized through automated home electrical systems. Strategies for replacing inefficient devices and systems are explored in order to save energy and money.

ENRG 112 Electrical Power Distribution

3 Credits

Prerequisites: None. This course is an introduction to the electrical grid and power distribution. It will cover the history of the current electrical grid and the future of the smart grid, basic electrical concepts, power generation, transmission, distribution, system operations, electrical market structures, regulation, restructuring, market dynamics, and most aspects of the electricity business. This course answers the questions of who creates the power we use, how it's distributed throughout the electrical grid, who determines the cost of electricity, and who controls our entire electrical infrastructure. The business and political environment regarding the energy industry will be heavily debated.

ENRG 114 Smart Grid Infrastructure and Networking

3 Credits

Prerequisites: None. The content of the course covers areas of smart grid infrastructure, security, and networking. It also focuses on the edge cutting integration and modernization of the current antiquated electrical grid system.

ENRG 203 Electric Line Distribution and Construction Practices I

3 Credits

Prerequisites: ENRG 102 and ENRG 103. This course offers an introduction to basic field practices for electric distribution employees, such as managing risk in power line work, working with conductors and cables, and operating switchgear. The various connections of transformers, troubleshooting transformers, and maintaining voltage levels to the customer will be covered.

ENRG 205 Electric Line Distribution and Construction Practices II

3 Credits

Prerequisites: ENRG 203. This course covers rigging in power line work, working with aerial devices and digger derricks, installing protective grounds, working with live electrical circuits, working with revenue metering, and maintaining streetlights.

ENRG 211 Underground Distribution

3 Credits

Prerequisites: ENRG 103. This course introduces the student to underground systems including drawings, materials, and installation practices. Installing, splicing, and terminating cables. Fusing, system maintenance, troubleshooting, and job site safety issues.

ENTR 101 The Entrepreneur and the Enterprise

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095 and MATH 023. This is an introductory entrepreneurship course that focuses on the creation of new ventures and the relationship between ideas, entrepreneurs, markets and enterprise as well as the role that entrepreneurship plays in our economy. The course evaluates the business skills and commitment necessary to successfully operate an entrepreneurial venture and help students decide if they have an interest in starting or being part of an entrepreneurially driven business.

ENTR 105 Entrepreneurial Marketing and Market Research

3 Credits

Prerequisites: ENTR 101 or BUSN 101. Corequisite: ENTR 101 or BUSN 101. Targeted to students interested in creating and growing their own businesses, this course will focus on key marketing strategies particularly relevant for new ventures. Students will: (1) apply marketing concepts to entrepreneurial company challenges, which include creating and nurturing relationships with new customers, suppliers, distributors, employees and investors; and (2) understand the special challenges and opportunities involved in developing marketing strategies "from the ground up."

ENTR 201 Venture Growth and Development

3 Credits

Prerequisites: ENTR 101 or BUSN 101. This course discusses financial, human resource, operations and marketing issues that face entrepreneurs whose businesses are confronted with significant growth potential or that have matured. Among the topics discussed are franchising, initial public offerings, mergers, succession, estate planning, global expansion and exit strategies.

ENTR 205 Financial Management for Entrepreneurs

3 Credits

Prerequisites: ENTR 101 or BUSN 101. Corequisite: ENTR 101 or BUSN 101. Upon successful completion of this course, the student should be able to identify and evaluate the various sources available for funding an enterprise; demonstrate an understanding of financial terminology; read, prepare and analyze a financial statement; and write a loan proposal. In addition, the student should be able to explain the importance of working capital and cash management. The student should also be able to identify financing needs, establish credit policies, and prepare sales forecasts.

ENTR 210 Entrepreneurial Tax and Finance

3 Credits

Prerequisites: ENTR 205. This is a comprehensive course covering federal and state tax situations for businesses. Tax topics will include income tax, sales and use tax, payroll tax, and unemployment tax. Financial topics include insurance, employee benefits, retirement planning, budgeting, interpretation of financial statements, and learning how to work with an accounting professional.

ENTR 250 New Venture Development

3 Credits

Prerequisites: ENTR 105 and ENTR 205. Application of principles and skills needed for implementation of a business plan to own and operate a successful venture. The principles and skills of the entrepreneur are utilized in the decision making process including the appropriate business structure and organization, developing plans and strategies for the entrepreneurial venture, financing strategies, exploring growth opportunities, and successfully managing scarce resources.

ENTR 281-294 Special Topics

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in entrepreneurship and small business development. Identifies and offers various special topics during each term under this course number.

EPCS 101 EPICS: Multidisciplinary Team Service Learning Projects

1 Credit

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 032 or ENGL 083. EPICS is a service-learning design course in which teams of students from across campus work together on long-term projects that benefit the community. Project work centers on the engineering/technology/computing needs of a community partner, but interdisciplinary team interaction is an integral element for project success. Students may participate in EPICS multiple semesters and participation for multiple consecutive semesters on a project team is encouraged. Teams are composed of first year and second year students. Most EPICS projects last at least one-year, though partnership with the community organization continues for several years. Projects are intended to solve real problems, are defined in partnership with their community partners, and span the complete design process cycle [problem identification – specification development – conceptual design – detailed design – production – service/maintenance – retirement].

EPCS 102 EPICS: Multidisciplinary Team Service Learning Projects **2 Credits**

Prerequisites: EPCS 101. EPICS is a service-learning design course in which teams of students from across campus work together on long-term projects that benefit the community. Project work centers on the engineering/technology/computing needs of a community partner, but interdisciplinary team interaction is an integral element for project success. Students may participate in EPICS multiple semesters and participation for multiple consecutive semesters on a project team is encouraged. Teams are composed of first year and second year students. Most EPICS projects last at least one-year, though partnership with the community organization continues for several years. Projects are intended to solve real problems, are defined in partnership with their community partners, and span the complete design process cycle [problem identification – specification development – conceptual design – detailed design – production – service/maintenance – retirement].

ESOL 005 Beginning English for Speakers of Other Languages **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Emphasizes basic writing, reading, listening and speaking with increasing competence in academic and social situations.

ESOL 006 Pre-Academic English for Speakers of Other Languages **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Emphasizes intermediate to academic writing, reading, listening and speaking with increasing competence in academic and social situations.

ESOL 041 English for Speakers of Other Languages– Reading I **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Develops basic reading skills in English using texts on subjects relating to life skills and cultural values. Emphasizes vocabulary acquisition, dictionary use, and reading strategies for basic comprehension and interpretation.

ESOL 042 English for Speakers of Other Languages– Reading II **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Stresses comprehension skills and reading strategies using materials which focus on personal and cultural values. Focuses on vocabulary expansion, comprehension and interpretation strategies, and experience with a variety of reading styles. Provides practice in increased reading proficiency.

ESOL 043 English for Speakers of Other Languages – Reading III **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Stresses comprehension skills and reading strategies with academic materials. Focuses on vocabulary expansion, transitional development, and critical analysis of academic writing. Provides practice in increased reading proficiency.

ESOL 051 English for Speakers of Other Languages – Listening/Speaking I **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Focuses on listening and speaking strategies for comprehensible input. Provides practice recognizing and producing speech patterns of American English. Allows for conversational practice on topics of cultural values and behaviors.

ESOL 052 English for Speakers of Other Languages-Listening/Speaking II **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Provides practice in recognizing and producing speech patterns of American English. Allows for conversational practice with emphasis on cross-cultural values and behaviors and the use of idioms.

ESOL 053 English for Speakers of Other Languages-Listening/Speaking III **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Provides experience in recognizing and producing speech patterns of American English. Allows for conversational practice relating to academic and cultural subjects, with an emphasis on critical thinking skills expressed verbally. Gives the student ample exposure to language use from sources both in and out of the classroom. Language tasks which require problem solving by interpersonal communications.

ESOL 061 English for Speakers of Other Languages – Grammar/Structure I **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Focuses on the acquisition of basic patterns of structure and syntax for controlled communication. Emphasizes form, meaning, and usage of basic structures in American English. Provides practice through extensive and varied communicative activities.

ESOL 062 English for Speakers of Other Languages – Grammar/Structure II **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Focuses on the study and acquisition of patterns of advanced structure and syntax. Emphasizes the acquisition of sentence structure for verbal and written communication of ideas and their relationship.

ESOL 063 English for Speakers of Other Languages-Grammar/Structure III

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Focuses on the acquisition of more advanced patterns of structure and syntax. Emphasizes the development of competent verbal and written expression in critical analysis for academic purposes.

ESOL 071 English for Speakers of Other Languages – Writing I

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Focuses on conventions for basic written communication in English, emphasizing sentence construction and paragraph development. Uses writing strategies to produce coherent expression in journals, free writing exercises, paragraphing, and short essays. Student collaboration is part of the learned writing process.

ESOL 072 English for Speakers of Other Languages – Writing II

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Focuses on techniques of written communication for coherent expression of ideas, through paragraph development and essay writing. Emphasizes the writing process using strategies for pre-writing, development, and revision through peer collaboration. Highlights the structure and syntax of written expression for effective communication.

ESOL 073 English for Speakers of Other Languages – Writing III

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment on the ESL COMPASS or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Focuses on techniques of written communication for the analysis and elaboration of academic material through paragraph and essay writing. Emphasizes the strategies of the writing process through rhetorical modes of composition for varied purposes. Stresses the extended use of syntax and structure for thoroughly coherent expression.

ESOL 081 Beginning Academic English for Speakers of Other Languages

3 Credits

Prerequisites: Demonstrated competency through appropriate ESOL assessment and ESOL Advisor Approval. Develops basic skills in English using texts on subjects relating to life skills and cultural values. The holistic approach of teaching/learning will be applied so that students develop basic Academic English skills in listening/speaking, reading, and grammar.

ESOL 082 Intermediate Academic English for Speakers of Other Languages

3 Credits

Prerequisites: Demonstrated competency through appropriate ESOL assessment or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Develops intermediate level skills of academic English using texts on subjects relating to life skills and cultural values. The holistic approach of teaching/learning will be applied so that students develop intermediate level skills of academic English in listening/speaking, reading, and grammar.

ESOL 083 Advanced Academic English for Speakers of Other Languages

3 Credits

Prerequisites: Demonstrated competency through appropriate ESOL assessment or successful completion of the previous level course with a "C" or better and ESOL Advisor Approval. Develops advanced level skills of academic English using texts on subjects relating to life skills and cultural values. The holistic approach of teaching/learning will be applied so that students develop advanced level skills of academic English in listening/speaking, reading, and grammar.

EXER 102 Strength Training

2 Credits

Prerequisites: None. Students will be introduced to resistance training on a theoretical and practical level. Students will learn guidelines for designing resistance training programs for various populations, with the goal of creating safe and effective strength-building workouts for individuals with various levels of resistance training expertise.

EXER 103 Physical Conditioning

2 Credits

Prerequisites: None. This course will teach students methods and modalities involved in fitness training to develop specific conditioning effects in individuals. Students will develop proficiency in the use of various exercises and exercise modes in improving cardiovascular and muscular endurance as well as body fat and other fitness-related markers. Emphasis is placed on ensuring safety and avoiding injuries while achieving fitness goals.

EXER 106 Nutrition for Athletic Performance

3 Credits

Prerequisites: None. The course will describe basic nutritional principles involved in nutrition for optimal athletic performance. Topics to be addressed include body composition, nutritional needs for special populations, nutritional supplementation, and contemporary issues in nutrition and fitness.

EXER 107 Psychology of Sport and Performance

3 Credits

Prerequisites: None. Students will learn, analyze, and apply principles of psychology relating to human performance and exercise adherence. Topics covered include important researchers and studies in the history of the field, as well as current issues and controversies relating to the mental aspects of sport and performance.

EXER 114 Physical Conditioning and Strength Training **3 Credits**

Prerequisites: None. Students will be introduced to resistance training on a theoretical and practical level. Students will learn guidelines for designing resistance training programs for various populations, with the goal of creating workouts for individuals with various levels of resistance training expertise and conditioning effects. Students will develop proficiency in the use of various exercises and exercise modes in improving cardiovascular and muscular endurance as well as body fat and other fitness-related markers. Emphasis is placed on ensuring safety and avoiding injuries while achieving fitness goals.

EXER 201 Weight Management **3 Credits**

Prerequisites: None. This is an introductory weight management course for students interested in improving their lives through a weight management program and for students who are interested in working with clients on a consultant basis.

EXER 203 Exercise for Special Promotions **3 Credits**

Prerequisites: None. This course will focus on the theory and practice of functional exercise training for various populations. Students will learn exercise program design techniques for healthy populations, populations with diseases, and populations with disabilities. Students will get practical hands-on activities that focus on stability and medicine balls, balance training, and free weights.

EXER 207 Applied Biomechanics **3 Credits**

Prerequisites: APHY 101 and APHY 102. Examination of kinetic and kinematic concepts involved in the analysis of functional movements and sport techniques. Topics include projectile motion, Newton's laws, center of gravity, mechanical energy, and more, as applied to movements of the human body.

EXER 210 Personal Training and Exercise Leadership **3 Credits**

Prerequisites: None. An introductory course to the business of personal training. This course will focus on the fundamental concepts in personal training for healthy, general populations.

EXER 212 Group Fitness Instruction **3 Credits**

Prerequisites: None. Introduces the fundamental elements of group fitness instruction. Areas of focus include: modes of exercise, music selection, choreography, cuing, leadership skills, and motivational techniques. A variety of instructional formats will be taught, including step, cardio, kickboxing, aqua, and specialty classes.

EXER 214 Recreation Sports **3 Credits**

Prerequisites: None. Focuses on the development, marketing, and facilitation of sports and fitness activities for the recreational athlete as well as the outdoor enthusiast. Topics include intramural sports, community education programs, camping and orienteering programs, adult recreation leagues, common injury patterns and prevention for recreational athletes, and strategies for renewing interest in longstanding recreational activities.

EXER 216 Health and Aging **3 Credits**

Prerequisites: None. Introduction to the complex physiological and psychological processes associated with aging. Topics include specific health problems associated with an older population, and methods for preventing or delaying some of the nonessential age-related declines in physical and mental function. Students will also address barriers to physical activity and effective exercise modes and adherence strategies for older populations.

EXER 217 Sport Facilities Management **3 Credits**

Prerequisites: None. Examination of the principles and skills involved in the management of sports facilities and events. Topics include the specific needs and issues relating to secondary school and college athletic facilities, municipal amenities, private and public athletic clubs, commercial fitness centers, and professional sports organizations. Topics will include personnel management; facility layout and design; objectives, goals, and mission statements; financial oversight; legal concerns; and more.

EXER 219 Social and Ethical Aspects of Sport **3 Credits**

Prerequisites: ENGL 111 and PSYC 101. This course examines how sport is affected by society, and how society is affected by sport. Ethical and moral issues in sport for athletes, coaches, administrators, staff personnel, and media will also be addressed.

EXER 279 Capstone in Kinesiology and Exercise Science **2 Credits**

Prerequisites: Program Chair Approval. Prepares the student for entry into the career field or college transfer. Provides students with the opportunity to work at a job site that is specifically related to their career objectives. Provides on the job experience and a greater understanding of the industry. Provides opportunities to network with others in the profession. Reviews the procedure for job search, resume writing, interviewing, and follow-up communications. Reviews process for transferring. Provides for taking program outcomes assessments.

FITN 100 Lifetime Fitness and Wellness **2 Credits**

Prerequisites: None. Educates students about the importance of fitness/ wellness in their everyday lives. Students will have the opportunity to customize their own behavioral plans for fitness/wellness.

FORN 101 Introduction to Forensic Science **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and MATH 015 or MATH 023. Introductory course dealing with the basic concepts in Forensic Science. Includes lab.

FORN 203 Crime Methods and Techniques **4 Credits**

Prerequisites: FORN 101 and CHEM 102 or CHEM 106. Advanced course addressing laboratory techniques used in Forensic Science. Includes lab.

FOUN 071 Tech Foundations **3 Credits**

Prerequisites: Appropriate test scores or prior coursework (See Course Placement Chart). Prepares the students for the demands of reading, writing and mathematical skills used in a variety of college-level courses in the industrial technology programs of study. Discipline related materials are used to encourage analytical and critical thinking in an integrated approach to learning and applying mathematical, reading, writing and oral communications skills.

FREN 101 French Level I **Transfer IN 4 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. An introductory course in French. Introduces the French language and Francophone culture through communicative activities intended to develop oral communication skills and listening comprehension skills. Emphasis is placed on learning basic grammar and vocabulary necessary for successful communication while laying a foundation for further study.

FREN 102 French Level II **Transfer IN 4 Credits**

Prerequisites: FREN 101 or demonstrated competency in French through appropriate assessment; demonstrated competency in reading and writing through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Continues the study of French for students who have had the equivalent of one semester of college-level French. Introduces additional grammatical structures and vocabulary to further develop listening, speaking, reading, and writing skills as well as an appreciation of the cultures of the francophone world.

FREN 201 French Level III **Transfer IN 3 Credits**

Prerequisites: FREN 102 or demonstrated competency in French through appropriate assessment; demonstrated competency in reading and writing through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. French is the primary medium of instruction. The goal of the course is to continue the development and reinforcement of the skills of the target language: listening, speaking, reading and writing at an intermediate level. The course continues the study of grammar/syntax, vocabulary building, and French civilization, culture, and literature through discussion and conversation coordinated with the reading of cultural and literary texts as well as written and oral reports.

FREN 202 French Level IV **Transfer IN 3 Credits**

Prerequisites: FREN 201 or demonstrated competency in French through appropriate assessment; demonstrated competency in reading and writing through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. French is the primary medium of instruction. The goal of the course is to continue the development and reinforcement of the skills of the target language: listening, speaking, reading and writing at an advanced intermediate level. The course continues the study of grammar/syntax and vocabulary building and continues the study of French and Francophone civilizations through readings, both journalistic and literary, and reinforced through class discussions as well as written and oral reports.

GENS 279 General Studies Capstone Course **1 Credit**

Prerequisites: Successful completion of 40 program hours and Program Advisor Approval. Provides a culminating experience designed to demonstrate the student's mastery of information literacy; ethical and responsible behavior; political, social and environmental responsibility; and diversity awareness, both in general and in the student's area of interest. May require a research project, presentation, and/or portfolio. Requires students to complete two sections of a college-approved standardized assessment of proficiency in math, writing, scientific inquiry, and/or critical thinking.

GEOG 207 World Geography **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. A geographical analysis of the major physical, cultural, political and economic divisions of the world along with their characteristics, locations, human activities, and inter-relationships.

GEOL 105 Physical Geology **4 Credits**

Prerequisites: MATH 123 or MATH 100 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Introduces physical concepts and theories pertaining to current applications and trends in geology. Intermediate level concepts pertaining to geological materials, and geological processes will be illustrated in lecture and demonstrated in lab experiments.

GERM 201 German Level III

3 Credits

Prerequisites: GERM 102 or demonstrated competency in German through appropriate assessment; demonstrated competency in reading and writing through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. German is the primary medium of instruction. The goal of the course is to continue the development and reinforcement of the skills of the target language: listening, speaking, reading and writing at an intermediate level. The course continues the study of grammar/syntax, vocabulary building, and German speaking countries, cultures, food, film, music, and literature through discussion and written and oral reports. Students continue to learn about German history as well as contemporary issues and examine daily life in the German speaking countries. Travel and tourism are also explored as well as studying abroad and career benefits to studying German.

GERM 202 German Level IV

3 Credits

Prerequisites: GERM 201 or demonstrated competency in German through appropriate assessment; demonstrated competency in reading and writing through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. German is the primary medium of instruction. The goal of the course is to continue the development and reinforcement of the skills of the target language: listening, speaking, reading and writing at an intermediate level. The course continues the study of grammar/syntax, and vocabulary building and continues the study of German language and culture through readings, both journalistic and literary, and reinforced through class discussions as well as written and oral reports. This will be the culmination of the four-course sequence at Ivy Tech and as such students will improve their reading, speaking, writing, and listening skills the greatest proficiency possible. Whenever possible, students will participate in integrated cultural activities to enrich their learning.

GRDN 110 Fundamentals of Gardening

3 Credits

Prerequisites: None. Studies the horticulture principles of plant structure, growth and development and soil science. Includes cultural practices, propagation techniques, plant care, nutrition, maintenance, and disease and insect control.

GRDN 114 Garden Design I

3 Credits

Prerequisites: EDSN 107. Corequisites: EDSN 107. Survey of basic garden landscape design. Includes topics on plant types and uses, client requirements, design concepts, site analysis, and garden planting plans and project presentation methods. Emphasizes the principles and techniques for designing outdoor gathering and living places.

GRDN 115 History of Garden Design

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. An overview of the history of garden design and landscape architecture from antiquities through the 21st century. Students will research influential garden designers, landscape architects, garden restoration and current trends.

GRDN 116 Sustainable Gardening and Permaculture

3 Credits

Prerequisites: None. Introduction to natural and sustainable gardening practices and permaculture design principles. Students will create gardens with an emphasis on plant communities, edible ecosystems, function and aesthetics. Includes studies in water conservation, soil development, wildlife and native gardens, and fruit and vegetable gardening.

HIMT 101 Introduction to Health Information Systems Technology

3 Credits

Prerequisites: Program Advisor Approval. Provides the opportunity for the investigation of career opportunities, ethics, history, and functions of the health information management profession. Provides an overview of the organization of healthcare delivery, including various types of healthcare institutions, accreditation standards, licensure and regulatory agencies, and payment and reimbursement systems. Introduces basic concepts and terminology for data accuracy, security, privacy, and confidentiality in manual and computerized systems.

HIMT 102 Health Data Content and Structure

2 Credits

Prerequisites: Program Advisor Approval. Introduction to health data collections methods for health information systems. Study of the datasets and databases used in various healthcare settings. Overview of the creation and maintenance of health information disease registries and indexes. Overview of concepts influencing electronic and computerized patient records and automation of health information management functions.

HIMT 104 Health Information and the Law

2 Credits

Prerequisites: Program Advisor Approval. Presents the substantial changes brought about by HIPAA and the growth of electronic health records systems and electronic data networks. Discusses the state laws affecting the use and disclosure of health information and the complex interplay of federal and state health information privacy laws. Addresses the challenging area of how patient information may be used in connection with medical research.

HIMT 106 Healthcare Informatics

3 Credits

Prerequisites: INFM 109. Corequisites: INFM 109. This course introduces concepts of health information systems such as database design and management, data warehousing, data mining, interoperability for health information exchanges, health information system acquisition and life cycle, health information registries and indices, EHRs, PHRs, information governance, and data stewardship. Students will study the evolution of health information systems including the transition from paper records to electronic records, HIPAA, HITECH, ARRA, and meaningful use. Students will also gain experience utilizing an electronic health record software.

HIMT 200 Basic ICD Coding	3 Credits
Prerequisites: HIMT 101, HIMT 102. Introduces students to the International Classification of Diseases coding system and provides the background and skills needed for assigning and sequencing of codes in accordance with approved guidelines.	
HIMT 201 Reimbursement Systems	3 Credits
Prerequisites: HIMT 101, HIMT 102. Presents data elements that apply to prospective payment systems. Enables students to gain knowledge of reimbursement systems and to identify issues and patient characteristics in meeting medical necessity guidelines.	
HIMT 202 Healthcare Data Literacy and Statistics	2 Credits
Prerequisites: HIMT 101, HIMT 102 and MATH 135 or MATH 136. Compilation and usage of various types of administrative and healthcare statistics including vital records. Includes an overview of the health information research process and the use of computers for data management.	
HIMT 203 ICD Coding	3 Credits
Prerequisites: HIMT 101, HIMT 102 and HIMT 210. Includes International Classification of Diseases (ICD) assignment and sequencing of codes in accordance with approved guidelines.	
HIMT 204 Quality Assessment and Improvement	2 Credits
Prerequisites: HIMT 101, HIMT 102 and HIMT 105. Presents the history and development of quality assurance in various healthcare facilities. Includes quality assessment techniques, utilization management, risk management, credentialing, and medical staff services as related to health information management.	
HIMT 205 Organization and Supervision	2 Credits
Prerequisites: HIMT 101, HIMT 102, HIMT 105. Includes principles and practices essential to the efficient supervision and management of health information departments including planning, organizing, directing, and controlling health information processes, personnel, finances, and space.	
HIMT 207 Health Information Externship I	1 Credit
Prerequisites: Program Advisor Approval. Provides the student with the opportunity to apply acquired health information technical knowledge in healthcare settings.	
HIMT 208 Health Information Externship II	1 Credit
Prerequisites: Program Advisor Approval. Provides the student with the opportunity to apply acquired health information technical knowledge in healthcare settings.	
HIMT 210 Pathophysiology and Pharmacology I	3 Credits
Prerequisites: APHY 102 and HLHS 101. Covers etiology, treatment, pharmacology, and prognosis of diseases associated with body systems.	
HIMT 213 CPT Coding	3 Credits
Prerequisites: HIMT 101, HIMT 102, and HIMT 210. Introduces Current Procedural Terminology (CPT) coding as applied in facility and physician perspectives. Includes general content, coding guidelines, and the role of CPT coding in healthcare reimbursement. Applies codes to basic medical and surgical services including the use of modifiers. Ethical coding and compliance issues emphasized.	
HIMT 219 Pathophysiology and Pharmacology II	3 Credits
Prerequisites: HIMT 210. Continuation of HIMT 210 to cover the etiology, treatment, pharmacology and prognosis of disease associated with body systems.	
HIMT 223 Advanced Anatomy and Physiology for ICD-10 Coding	2 Credits
Prerequisites: APHY 102, HIMT 101, HLHS 101. Provides an advanced understanding of anatomy and physiology as it pertains to the ICD-10 coding system. Includes anatomical and physiological documentation requirements for code capture in the ICD-10 coding system. Introduces ICD-10-CM/PCS coding guidelines.	
HIMT 283, 284, & 288 Special Topics	1-3 Credits
Prerequisites: Program Advisor Approval. Discusses topics of current interest in health information technology. Identifies and offers various special topics during each term under this course number.	
HIST 101 Survey of American History I	Transfer/IN 3 Credits
Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and or ENGL 083. Covers major themes and events in American history from domestic and global standpoints, including exploration of the New World; the colonial period; causes and results of the American Revolution; the development of the federal system of government; the growth of democracy; early popular American culture; territorial expansion; slavery and its effect; reform movements, sectionalism; causes and effects of the Civil War. <i>Students who apply to and are admitted in to the American Honors Program at Ivy Tech, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.</i>	

HIST 102 Survey of American History II

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Covers major themes including the post Civil War period, western expansion, industrial growth of the nation and its effects, immigration and urban discontent and attempts at reform, World War I, the Roaring Twenties, social and governmental changes of the thirties, World War II and its consequences, the growth of the federal government, social upheaval in the sixties and seventies, and recent trends in conservatism, globalization, and cultural diversity.

HIST 111 World Civilization I

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Presents the key individuals, events and schools of thought, which have most greatly impacted societal development and world history up to 1650. The target civilizations of study include Oriental, the Middle East, Western Europe, Africa, and the Americas. Discusses the political, economic, social and cultural evolution of human civilization.

HIST 112 World Civilization II

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Presents the key individuals, events and schools of thought, which have most greatly impacted societal development and world history since 1500. Studies key movements and events of the periods. Discusses the political, economic, social, and cultural evolution of civilization.

HIST 125 History of American Technology

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095, or FOUN 071. This course will examine the technological development of the United States. Emphasis will be given not only to the inventions themselves but the reasons why such technology was needed and what influence the technology has had on the United States society.

HIST 201 Latin American History and Culture: Prehistory to 1824

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. An historical survey of Latin American history, institutions, culture, and art from pre-Colombian times to colonial time, with emphasis on the evolution of civilization and culture in the countries of South and Central America and the Caribbean basin.

HIST 202 Latin American History and Culture: 1824 to Present

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. A historical survey of Latin American history, institutions, culture, and art from independence, to the emergence of modern Latin American nations, with emphasis on the civilization and culture in the countries of South and Central America and the Caribbean basin.

HIST 210 African-American History

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Covers major themes of African-American history, its social and economic meaning; the struggle for freedom and social and political equality; contributions of African-Americans to cultural life in the United States and the world.

HLHS 095 Introduction to Dementia Care

0.5 Credit

Prerequisites: None. The course will introduce the student to the disease process and aspects of caring for a resident with dementia. This course will include instruction about treating the patient with dementia as a person, medical treatment of dementia, the importance of proper communication, making the environment safe for a person with dementia, including the family in caring for the client with dementia as well as how to plan activities that are meaningful and fun for the patient with dementia. The course will meet all of the requirements outlined in the Indiana State Department of Health regulations of health care workers in long-term care facilities.

HLHS 100 Introduction to Health Careers

3 Credits

Prerequisites: None. Presents information on the health care system and employment opportunities at a variety of entry levels. Includes an overview of health care development, how health delivery systems are organized, legal and ethical considerations of health care delivery, and an overview of various health care professions. Students are encouraged to explore health professions through assignments, observations and interviews.

HLHS 101 Medical Terminology

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Addresses basic terminology required of the allied health professional and provides a basic knowledge of anatomy and physiology, pathology, special procedures, laboratory procedures, and pharmacology. Greek and Latin prefixes, suffixes, word roots, and combining forms are presented. Emphasis is on forming a foundation for a medical vocabulary including meaning, spelling, and pronunciation. Medical abbreviations, signs, and symbols are included.

HLHS 103 Dosage Calculation

1 Credit

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 015 or MATH 023. Introduces the mathematical concepts required of the allied health professional to accurately administer medication.

HLHS 104 CPR/Basic Life Support

0.5 Credit

Prerequisites: None. Provides students with information necessary to recognize the need for one and two-person cardiopulmonary resuscitation (CPR) as it relates to adults, children and infants. Requires students to safely perform CPR and the use of Automated External Defibrillator (AED).

HLHS 105 Medical Law and Ethics

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Provides an overview of law and ethics for allied health professionals functioning in a variety of settings. Topical areas include: the legal system, standards and scope of care and practice, physician patient relationships, standards of professional conduct, public duties, documentation, employment laws and practices, pertinent federal/state statutes, ethical codes, and bioethical issues. The content will provide an understanding of ethical and legal obligations to self, patients, and employer.

HLHS 106 Health Care Support Certifications

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Provides students with information necessary to recognize and safely perform one and two-person cardiopulmonary resuscitation (CPR) as it relates to adults, children and infants including use of the AED. Successful demonstration of principles and techniques related to resuscitation, bloodborne pathogens, and First Aid will result in the granting of appropriate certifications.

HLHS 107 CNA Preparation

5 Credits

Prerequisites: Regulations per the Indiana State Department of Health and Program Advisor Approval. Prepares individuals desiring to work as nursing assistants with the knowledge, skills and attitudes essential for providing basic care in extended care facilities, hospitals and home health agencies under the direction of licensed nurses. Presents information on the health care system and employment opportunities at a variety of entry levels. Includes an overview of the health care delivery systems, health care teams and legal and ethical considerations. Individuals who successfully complete this course are eligible to apply to sit for the Indiana State Department of Health (ISDH) certification exam for nursing assistants. This course meets the minimum standards set forth by the ISDH for Certified Nursing Assistant training.

HLHS 108 Advanced Cardiac Life Support

1 Credit

Prerequisites: Successful completion of American Heart Association Basic Life Support Course including CPR for Adult, Child, Infant and AED. Provides students with information necessary to provide advanced cardiac life support safely using case scenarios, mock codes and following American Heart Association protocol and algorithms.

HLHS 109 Pediatric Advanced Life Support

1 Credit

Prerequisites: Successful completion of American Heart Association Basic Life Support Course including CPR for Adult, Child, Infant and AED. Provides healthcare providers with sufficient knowledge to initiate advanced life support in a pediatric emergency, either in or out of hospital. Enhances the students' skills in evaluation and management of an infant or child respiratory and cardiac emergencies including cardiac arrest according to the 2010 standards/ guidelines of the American Heart Association.

HLHS 110 Tuberculosis Training

0.5 Credit

Prerequisites: None. This course was designed to instruct the participant on the classifications of tuberculosis, the incidences of tuberculosis and disease, the common diagnostic procedures for tuberculosis, the common treatment regimens for tuberculosis, the correct techniques for administering a Mantoux skin test and the correct method of reading and recording the results of a Mantoux skin test. The students will be given a validation card from the ISBH (Indiana State Board of Health) and the ALA (American Lung Association) after successful completion of the course according to criteria set forth by both of the validating agencies.

HLHS 111 Health and Wellness for Life

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course promotes the development and maintenance of health and wellness throughout life. Current topics of interest such as stress management, nutrition, fitness, environmental health, and changing needs during various stages of life are explored. Students evaluate their own health and risk factors associated with modern lifestyles.

HLHS 112 Home Health Aide Bridge

2 Credits

Prerequisites: Indiana State Department of Health (ISDH) Certified Nursing Assistant (CNA) Certification. This course provides students who have successfully passed the Certified Nurse Aide course and are on the Indiana State Department of Health (ISDH) Nurse Aide registry in good standing, the knowledge and practical skills necessary to function as a home health aide. The course follows the established content criteria of the Indiana Home and Hospice Care Foundation, Home Health Aide Certification. Upon completion of each content area, students will be eligible to apply to take the corresponding written and skills examination for Home Health Aide certification. Inclusion on the Indiana State Department of Health Home Health Aide Registry is facilitated by home health/hospice employers after employment and verification of required skills competency evaluation. Curriculum meets minimum requirements outlined in Federal OBRA-87 regulations for home health aides.

HLHS 113 Dementia Care

3 Credits

Prerequisites: None. The course will introduce the student to the disease process and aspects of caring for a resident with dementia. This course will include instruction about treating the patient with dementia as a person, medical treatment of dementia, the importance of proper communication, making the environment safe for a person with dementia, including the family in caring for the client with dementia, as well as how to plan activities that are meaningful and fun for the patient with dementia. The course will meet the requirements outlined in the Indiana State Department of Health regulations of health care workers in long-term care facilities.

HLHS 114 Home Health Aide

5 Credits

Prerequisites: None. Course provides students with knowledge and skills necessary to function as a home health aide. It follows the established content criteria of the Indiana Home Health and Hospice Association for career-ladder certifications for Trained Homemaker/Companion, Trained Personal Care Attendant I, Trained Personal Care Attendant II, and concluding with Trained Home Health Aide. Upon completion of each area, students will be eligible to apply to take the corresponding written and skills examinations for certification in each level. Inclusion on the Indiana State Department of Health Home Health Aide Registry is facilitated by home health/hospice employers after employment and verification of required skills competency. Curriculum meets minimum requirements outlined in Federal OBRA-87 regulations for home health aides.

HLHS 115 Pharmacology for Health Care Support

3 Credits

Prerequisites: APHY 101 or APHY 203 and HLHS 101. Introduces general pharmacology for health related professions including an overview of the history of drugs, federal and state regulations for the prescribing and distribution of therapeutic drugs, drug classifications, routes of administration, and how to use printed and electronic sources of drug information. Emphasis will be given to selected drugs in various drug classifications to develop student understanding of the use, side-effects, contraindications, and potential drug interactions that are unique to each drug.

HLHS 117 QMA Preparation

5 Credits

Prerequisites: Program Advisor Approval and regulations per the Indiana State Department of Health: demonstrated ability to read and write in English; demonstrated ability to perform the four basic mathematical functions, proof of high school diploma or GED, proof of being at least 18 years of age, proof of completion of Indiana CNA course or its equivalent and inclusion on Indiana Nurse Aide Registry, documentation of at least 1000 hours of work experience as CNA within two years prior to applying to become a QMA; other regionally determined registration requirements. Course meets the minimum standards set forth by the ISDH for Qualified Medication Aide (QMA) training and provides students with knowledge and skills needed to administer approved medications in long term care settings. Classroom instruction is provided, followed by clinical training that is supervised one-on-one by a licensed nurse. Common medications in current use are discussed according to body systems, with emphasis on classification, uses, routes of administration, dosages, interactions incompatibilities, and side effects. Also addressed are communication, standard precautions, safety, residents' rights, documentation, scope of practice of the QMA, legal aspects and patient education. Individuals who successfully complete this course are eligible to apply for the Indiana State Department of Health (ISDH) competency evaluation test for Qualified Medication Aides.

HLHS 118 Diversity in Health Care

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in or ENGL 093 Introduction to College Writing and ENGL 083 Reading Strategies for College or ENGL 095 Integrated Reading and Writing. Catalog Description: Explores diversity and its relationship to the provision of effective health care. Exposes the students to a variety of theories, viewpoints, and communication patterns within and across various cultures, ethnic groups, religions, and sexual identifications.

HLHS 119 Bereavement Care

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This introductory course provides an overview of death, dying and bereavement for allied health professionals functioning in a variety of settings. Topical areas include: dying, death, and bereavement in the United States. We will examine the social meanings of dying and death, death perceptions from childhood through older adulthood, religion and death attitudes, the dying process, living with dying, dying in the American health care system, euthanasia and biomedical issues, suicide, cross-cultural perspectives on dying and death, the business of dying, the legal aspects of dying, and the bereavement process. We will also address the aspect of loss and care and support of the healthcare provider as he/she deals with loss and grief in the working environment.

HLHS 120 Healthcare in the Rural Community

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Explores healthcare delivery in the rural community. Exposes the students to the unique differentiators of healthcare in the rural community. Discusses issues around access, disparities, and strategies to bridge these gaps. Includes a service learning project in the rural setting.

HLHS 121 Customer Relations in Healthcare

3 Credits

Prerequisites: None. This course is designed to introduce students to the health care environment and the expectations of them as healthcare professionals and as a team member. Students will develop the necessary skills for recognizing and providing excellent customer relations as a healthcare professional and as a representative of a healthcare provider. Utilizing various methods the student will develop an understanding and attitude of superior customer relations which is critical to success for a healthcare professional and as a representative of a healthcare provider.

HLHS 122 Electronic Health Records

3 Credits

Prerequisite: HLHS 101. Corequisite: HLHS 101. This course will cover the background, history, issues, and barriers to system adoption of Electronic Health Records (EHRs). The course will focus on real-world use and deployment of Electronic Health Records (EHRs) through readings, hands-on labs, and case studies. Students will learn the functionality of EHRs and understand how EHRs change healthcare delivery workflows in today's healthcare facilities. Students will be eligible to take the NHA Certified Electronic Health Record Specialist (CEHRS) certification exam after successful completion of the course.

HLHS 171 Restorative and Rehab Therapy Aide

3 Credits

Prerequisites: Proof of completion of Indiana CNA course or its equivalent and inclusion on Indiana Nurse Aide Registry; Program Chair Approval. Provides knowledge and skills needed to facilitate attainment of optimal levels of ability with a focus on achieving maximum function and self-sufficiency. Introduces common physical ailments of patients in subacute, long term, and outpatient facilities. Examines safety measures and common treatment modalities, including range of motion exercises, use of self-help devices and ambulation programs. Also addressed are instruction and assistance in activities of daily living and maintenance programs following formal therapy.

HLHS 202 Community Resources

3 Credits

PREREQUISITES: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in or ENGL 093 Introduction to College Writing and ENGL 083 Reading Strategies for College or ENGL 095 Integrated Reading and Writing. Catalog Description: Introduction to social service record keeping and community resources. Emphasis will be given to universal documents found in most agencies, as well as record content, format, sequence and structure; overview of common community agencies and typical services provided by each. Emphasis is on identifying and discussing the uses and applications of community resources in supporting patients and their families. Students will learn and simulate techniques for interacting with patients and their families, and will examine collaborative strategies for interdisciplinary healthcare team efforts.

HLHS 203 Disability Awareness in Health Care

3 Credits

Prerequisites: HLHS 101. Focuses on how the healthcare professional can recognize patients with disabilities and assist those patients with health care issues and treatments. Explores target populations and specific needs for these groups.

HLHS 211 Nutrition

3 Credits

PREREQUISITES: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 Introduction to College Writing and ENGL 083 Reading Strategies for College or ENGL 095 Integrated Reading and Writing and HLHS 111 Health and Wellness for Life

HLHS 221 Patient Care Technician Prep

4 Credits

Prerequisites: HLHS 107 and HLHS 101. Corequisite: APHY 102. Examines the role of the patient care technician as a member of the inter/intraprofessional disciplinary team in today's health care systems. Explores the patient care technician's role in providing for basic physiological, psychosocial, cultural, intellectual, and spiritual needs of patients. Introduces fundamental principles of therapeutic communication and teaching/learning. Provides a basic understanding of the administrative duties of the disease process and responsibilities pertinent in the acute health care setting.

HLHS 222 Patient Care Technician Experiential Seminar

2 Credits

Prerequisites: HLHS 221 and PCA. Provides opportunities to observe, perform, and discuss various Patient Care Technician procedures and competencies under supervision in lab and/or clinical settings.

HLHS 279 Health Care Support Capstone

1 Credit

Prerequisites: Program Advisor Approval. Prepares the student for entry into the health care world. Reviews procedures for interviewing, team participation, and ethical and productive job performance. Provides for taking program outcomes assessments.

HOSP 101 Sanitation and Safety

2 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Corequisite: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093. This course will help students learn basic principles of sanitation and safety in order to maintain a safe and healthy food service environment. It presents laws and regulations related to safety, fire, and sanitation and how to adhere to them in the food service operation.

HOSP 102 Basic Food Theory and Skills

3 Credits

Prerequisites: HOSP 101. Corequisites: HOSP 101. In this course students will learn the fundamentals of food preparation, service procedures, and safety practices in the food service industry including proper operation techniques for equipment. This course also provides a background and history of the hospitality industry and introduces the student to the broad spectrum of hospitality/food service organizations and career opportunities. Students will be familiarized with the organizational structure and basic functions of departments.

HOSP 103 Soups, Stocks, and Sauces

3 Credits

Prerequisites: HOSP 101 and HOSP 102. How to prepare the four major stocks, the five mother sauces (in addition to smaller sauces) and various soups. Additional emphasis is placed on the further development of the classical cooking methods.

HOSP 104 Nutrition**3 Credits**

Prerequisite: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course introduces the characteristics, functions and food sources of the major nutrient groups and how to maximize nutrient retention in food preparation and storage. Students will be made aware of nutrient needs throughout the life cycle and to apply those principles to menu planning and food preparation.

HOSP 105 Introduction to Baking**3 Credits**

Prerequisites: HOSP 101. Corequisites: HOSP 101. This course presents fundamentals of baking science, terminology, ingredients, weights and measures, and proper use and care of equipment. Students will produce yeast goods, pies, cakes, cookies, and quick breads.

HOSP 106 Pantry and Breakfast**3 Credits**

Prerequisites: HOSP 102 and HOSP 105. Corequisites: HOSP 105. This course covers the techniques and skills needed in breakfast cookery as well as insight into the pantry department. Various methods of preparation of eggs, pancakes, waffles and cereals will be discussed. Students will receive instruction in salad preparation, salad dressing, hot and cold sandwich preparation, garnishes and appetizers.

HOSP 107 Hospitality Sales and Marketing**3 Credits**

Prerequisites: HOSP 114. This course provides a foundation in hospitality sales and marketing with a primary focus on sales techniques for selling hospitality products and services to targeted markets.

HOSP 108 Human Relations Management**2 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course is designed to teach the necessary skills for proper recruiting, staffing, training, and management of employees at various levels. The course will help prepare the student for the transition from employee to supervisor. Additionally, it will help the student evaluate styles of leadership, and develop skills in human relations and personnel management.

HOSP 111 Yeast Breads**3 Credits**

Prerequisites: HOSP 105. Prepares students to produce a variety of yeast-raised breads and rolls using both straight dough and sponge dough methods. The course emphasizes proper mixing, fermentation, make-up proofing, and baking.

HOSP 113 Baking Science**3 Credits**

Prerequisites: HOSP 105. To help students understand the science of baking and the different reactions that take place based on the ingredients, temperatures, and equipment in relation to the final product.

HOSP 114 Introduction to Hospitality**3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course is designed to develop an understanding of the hospitality industry and career opportunities, and responsibilities in the food service and lodging industry. Introduces procedures for decision making which affects operation management, products, labor, and revenue.

HOSP 115 Diet Therapy**3 Credits**

Prerequisite: HOSP 104. This course presents the basic principles of nutrition; the role nutrients play in maintaining good health as well as their effect on certain disease states. Students will learn to modify diets to meet various nutritional needs and to plan menus using modified diet principles.

HOSP 116 Dietary Management/Supervision**3 Credits**

Prerequisite: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course presents the basic principles of management and supervision. The course is designed to teach skills necessary to goals of a person wishing to become a dietary manager.

HOSP 117 Dietary Management/Cost Controls**3 Credits**

Prerequisite: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course presents the basic principles of management and supervision for the dietary professional. Skills learned through this course and included practices are applicable to management level positions.

HOSP 118 Clinical Assessment and Documentation**3 Credits**

Prerequisites: HOSP 115. Developing an in-depth understanding of the principles of diet therapy. Students will learn to assess patients' nutritional needs, develop care plans, and implement a delivery system. Students will also learn documentation skills required by Centers for Medicare and Medicaid Services (CMS).

HOSP 127 Hotel and Restaurant Accounting**3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in or ENGL 093 and ENGL 083 or ENGL 095 and MATH 080. This course provides a basis of understanding hospitality accounting concepts and procedures, the processing of hospitality financial data, and the flow of financial information in the accounting cycle that results in the production of financial statements.

HOSP 151 Introduction to Wine Service

3 Credits

Prerequisites: Proof of at least 21 years of age. Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course will present the most important information about wines as it relates to the foodservice industry; as well as other essential aspects in becoming a professional sommelier. Students in this course will gain an understanding of the products, their relationship to food, and their profit potential. The focus of the course is on wine, but will include other fermented and distilled items and tobacco. Students will develop an appreciation of the different types of wine, beer, spirits and cigars; and learn criteria by which they are evaluated. In addition, students will learn the principles of purchasing, storing, issuing, pricing, merchandising, and service of wines in a restaurant setting.

HOSP 152 Introduction to Beer Service

3 Credits

Prerequisites: Proof of at least 21 years of age. Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course provides an overview of responsible beverage alcohol service and includes the principles of production, storage, and service of beers. Major categories of beer are evaluated to include the practical brewing and sensory analysis of beer styles.

HOSP 153 Sensory Analysis

3 Credits

Prerequisites: Proof of at least 21 years of age. HOSP 151 and HOSP 152. This course will expand on fundamental questions about the world of wine, spirits, beer and service. It will develop skills in blind tasting utilizing the Master Sommelier Deductive Tasting Method that has been tailored to a written format. The coursework will practice Standard Wine Service, Champagne Service and Decanting Service. It will look at a variety of elements surrounding these skills as well as the knowledge of aperitifs, cocktails, food and wine pairing, proper service temperature of wine and beverages, and ability to communicate and sell.

HOSP 171 Introduction to Convention/Meeting Management

3 Credits

Prerequisite: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course provides a comprehensive understanding of the convention/meeting management industry including the roles of various service providers, space requirements, and uses of convention facilities.

HOSP 173 Special Event Management

3 Credits

Prerequisites: HOSP 114. This course is designed as a detailed look at the planning of social events, such as theme parties and weddings, planning for fundraising events; planning recognition events; and planning entertainment for events. Topics included are different event types, design and creativity for events, use of contractors and suppliers, incorporation of sponsors, use of volunteers, and ethical and legal considerations of event planning. This course will be serve as a foundation for students preparing for a career in event planning, as well as continuing education for those currently employed in the event industry. Students in this course will engage in experiential learning by becoming actively involved in the planning, preparation and execution of events facilitated by the instructor.

HOSP 200 Meat and Seafood Fabrication

3 Credits

Prerequisites: HOSP 103. Corequisites: HOSP 103. This course emphasizes the importance of meats, poultry, fish and seafood in today's market. The student will become familiar with the different varieties and characteristics of meat, poultry, fish and seafood. Students will learn the basic principles of structure, handling, and cooking to utilize the many varieties of meat, poultry, fish and seafood in a systematic way. The course will cover grading and inspection, basic cuts, proper purchasing, receiving, storage, aging, preparation and merchandising of meat, poultry, fish and seafood. The course provides hands-on experience in boning, cutting, and cooking methods appropriate for meat, poultry, fish and seafood. The student will be responsible for the fabrication of meats, poultry, fish and seafood for final preparation.

HOSP 201 Hospitality Purchasing and Cost Control

3 Credits

Prerequisites: HOSP 102 and MATH 118 or MATH 123. This course presents the essentials of effective food and beverage control while establishing systems for sale values of food and beverages that are outlined. This course addresses the application of the four-step control process to the primary phases of foodservice operations: purchasing, receiving, storing, issuing and production. Labor costs and sales forecasting are analyzed.

HOSP 203 Menu, Design and Layout

3 Credits

Prerequisites: HOSP 201. Applying the principles of menu planning, pricing, and layout to the development of menus for a variety of types of facilities and service. The major project will be to develop a menu, design and layout of a hospitality facility.

HOSP 207 Customer Service

3 Credits

Prerequisites: HOSP 101 and HOSP 102. Provides students with practical knowledge and skills of restaurant operations. Knowledge and appreciation of the relationship between "front" and "back" of the house is emphasized through operation of an actual food service environment. Quality of service is emphasized through management of the guest experience. Additional course work will include tableside cookery and the study of beverages and wines.

HOSP 208 Cakes, Icings, and Fillings

3 Credits

Prerequisites: HOSP 105. Requires students to produce and finish a variety of cakes. The course emphasizes application techniques, color coordination, and the flavor and texture of fillings. Students will practice the techniques of basic cake decorating.

HOSP 209 Advanced Decorating and Candies

3 Credits

Prerequisites: HOSP 208. The second in a series in decorating techniques and candy making. Students will construct classical and contemporary candy products including centerpieces and/or showpieces made with selected confectionery mediums.

HOSP 210 Classical Cuisine

3 Credits

Prerequisites: Program Advisor Approval. Presents advanced and sophisticated classical culinary methods following the principles and techniques of Escoffier. Students will advance cooking techniques, timing, and presentation and learn history and terms pertaining to classical foods and menus with emphasis on French cuisines.

HOSP 211 Specialized Cuisine

3 Credits

Prerequisites: HOSP 106 and HOSP 200 and HOSP 207. Corequisites: HOSP 207. Students will be introduced to foods from various cultures. Students will gain a sense of the history of foods from various countries as well as develop skills in preparation of these foods. Students will advance skills in table service as well as tableside preparation.

HOSP 212 Garde Manger

3 Credits

Prerequisites: HOSP 106. Helps students develop skills in producing a variety of hot - served cold food products as it relates to the garde manger area. Students will prepare items for buffet presentation, including decorative pieces such as tallow and ice sculptures.

HOSP 213 Classical Pastries and Chocolates

3 Credits

Prerequisites: HOSP 105. This course address classical French and European desserts, including the preparation of goods such as Napoleons, Gateau St. Honoré, petit fours and petit fours sec, ganaches, pastry creams and fillings, sauces, flans and tarts, and European sponges. The course also includes instruction in tempering of chocolates, molding, and chocolate plastique, preparation of truffles, pastillage and marzipan, short doughs, and meringues. The student will be instructed in the latest preparation methods, innovative ideas for impressive plate presentations, and techniques that utilize specialized equipment and tools to make high-tech, nouvelle creations.

HOSP 215 Front Office

3 Credits

Prerequisites: HOSP 114. This course presents a systematic approach to front office procedures, detailing the flow of business through a hotel beginning with the reservation process and ending with billing and collection procedures within the context of the overall operation of a hotel. Students will examine front office management, the process of handling complaints and concerns regarding hotel safety and security. Students will become involved in the processes for forecasting future business, sales, and rate structure of the hotel as well as methods for budgeting hotel finances for success.

HOSP 217 Housekeeping

3 Credits

Prerequisites: HOSP 114. This course introduces the fundamentals of housekeeping operations. Emphasis is placed on employee development, management skills, OSHA standards and property maintenance and up-keep. Budgeting, cost controls, proper staffing and planning a fiscal budget are also emphasized in this course.

HOSP 221 Catering Administration

3 Credits

Prerequisites: Program Advisor Approval. This course provides instruction in the fundamentals of catering; including the business of supplying food, goods, and organized service for public and private functions. Subjects to be covered include staffing, equipment, transportation, contracting, special arrangements, beverage service and menu planning. Students will practice techniques of setting up banquets and buffets. Students are required to plan, budget, cost, test recipes and formats, plan décor, service and entertainment for catered events.

HOSP 227 Hospitality Facilities Management and Design

3 Credits

Prerequisites: HOSP 114. This course provides a foundation of information needed to manage the physical plant of a hotel or restaurant and work effectively with the engineering and maintenance department.

HOSP 228 Managing Technology in the Hospitality Industry

3 Credits

Prerequisites: HOSP 114. This course provides an overview of the information needs of lodging properties and food service establishments and addresses essential aspects of computer systems, such as hardware, software, and generic applications. The course focuses on computer-based property management systems for both front office and back office functions; examines features of computerized restaurant management systems; describes hotel sales computer applications, revenue management strategies, and accounting applications. The course also addresses the selection and implementation of computer systems, managing information systems and examines the impact of the Internet and private intranets in the hospitality industry.

HOSP 230 Wedding Cake Production

3 Credits

Prerequisites: HOSP 208. Corequisites: HOSP 208. This course will introduce the student to the fundamentals of wedding cake production. It will engage the student in elementary, handmade production of various styles of products including stacked and separated tiered cakes. In addition, this course will review and expand upon decorating techniques covered in HOSP 208. It further engages the student in decorative techniques of select cakes. The student will apply the basic principles of sanitation and safety in the foodservice operation. Student will apply the fundamentals of baking science to the preparation of a variety of wedding cakes, icings, and fillings.

HOSP 232 Plated Desserts

3 Credits

Prerequisite: HOSP 209. Corequisite: HOSP 209. This course will build on the fundamentals mastered in Classical Pastries and Advanced Decorating and Candies. The class will focus on developing plated desserts that are appropriate for restaurant and hotel menus. Themes include: balancing a dessert menu with flavors, textures, temperatures and visual appeal, seasonality of ingredients. Emphasis placed on creative plate presentation and artistry. The class will look at the production restrictions that may be present under different shop conditions. It will take into account challenges presented by staffing, facility and service volume.

HOSP 251 Spirits and Bar Management

3 Credits

Prerequisites: HOSP 151, HOSP 152, and HOSP 153. Proof of at least 21 years of age. This course provides an overview of classic spirits of the world, their history, and their modern production methods also are reviewed. Students practice mixology, training, and evaluation in bartending skills through classroom laboratory.

HOSP 253 Beverage Service

3 Credits

Prerequisites: Proof of at least 21 years of age. HOSP 153 and HOSP 251. This course provides students with practical knowledge and skills of restaurant operations. Knowledge and appreciation of the relationship between "front" and "back" of the house is emphasized through operation of an actual beverage service environment. Quality of service is emphasized through management of the guest experience. Additional course work will include tableside mixology and the service of beverages and wines.

HOSP 270 Bakery Merchandising

3 Credits

Prerequisites: Program Advisor Approval. In this course, the student will learn about and practice merchandising techniques with an emphasis on the baking and pastry field. The majority of a student's time will be spent in all pertinent phases of retail bakeshop operation or in the field observing merchandising in action.

HOSP 271 The Mechanics of Meeting Planning

3 Credits

Prerequisites: HOSP 171. An in-depth examination of the meetings and conventions industry, this class will focus on the operational aspects of the various industry segments and the intra-industry interactions of each. The course will provide an in-depth study and application of the techniques used for successful meetings, conventions and expositions. The text used is one of the main components used to study for the Certified Meeting Professional (CMP) examination – the highest level of expertise in meetings management. Class activity will help prepare the student for the CMP examination.

HOSP 272 The Tourism System

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and MATH 015 or MATH 023. Designed to develop an understanding of travel trends and modes and the social, environmental, and economic impact on destination areas. The course explores major concepts in tourism, what makes tourism possible, and how tourism can become an important factor in the wealth of any nation. Emphasis is given to local, regional, and national tourism.

HOSP 278 Dietary Management Internship

2 Credits

PREREQUISITES: HOSP 101, HOSP 104, HOSP 115, HOSP 116, HOSP 117, HOSP 118. This course offers practical experience in a health care facility monitored by a Registered Dietician in order to build specialized skills. This work-based experience provides an opportunity for students to transfer their academic preparation into actual work-based learning by acquiring "real world" skills and building ties with the healthcare community. Student must complete 150 hours of field experience. (Students should have a site in mind prior to registering for this course--coordinator will assist.)

HOSP 280 Co-op/Internship

1 Credit

Prerequisites: Program Advisor Approval. A practical experience in a commercial/non-commercial foodservice or hotel establishment in order to build specialized skills. This work-based experience provides an opportunity for students to transfer their academic preparation into actual work-based learning by acquiring "real world" skills and building ties with the business/professional community. (Students should have a site in mind prior to registering for this course--coordinator will assist.)

HPER 205 Structural Kinesiology

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and MATH 023, MATH 100 or MATH 080. Fundamental concepts concerning the interaction of biological and mechanical aspects of the musculoskeletal and neuromuscular structures. Emphasis on practical application to study and teaching of skilled human movement. Laboratory sessions focus on anatomy of the musculoskeletal system with application to human movement in sport, physical education, and daily activities.

HPER 211 Introduction to Sport Management

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and MATH 023, MATH 100 or MATH 080. An examination of the broad spectrum of career opportunities available in the sport management profession. Includes career planning, sport management terminology, and an overview of specific skills and courses required for professional preparation in sport management. Fundamental aspects of the management functions as each relates to sport and fitness organizations. A preliminary investigation of managerial roles and skills, and their effects on interpersonal, group, and organizational relationships.

HPER 212 Introduction to Exercise Science

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and MATH 023, MATH 100 or MATH 080. An introduction to the science of exercise and human movement. Special topics in exercise physiology, sport biomechanics, sports medicine, and motor integration.

HPER 216 Current Concepts in Physical Fitness

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and MATH 023, MATH 100 or MATH 080. Introduction to physical fitness and the role of exercise in health and wellness. Understanding concepts, principles, and guidelines for fitness exercise and related activities. Use of physical fitness assessment data to plan and carry out a personal fitness program.

HSPS 101 Introduction to Homeland Security

3 Credits

Prerequisites: None. Provides a comprehensive account of past and current homeland security practices, policies and programs in relation to the government restructure. Topics include workplace security, weapons of mass destruction, domestic and international terrorism, and preparedness. Also included is an expansion of material on the organization's strategic and philosophical changes that have occurred as a result of the Homeland Security Review completed in 2010.

HSPS 102 Introduction to Public Safety

3 Credits

Prerequisites: None. Introduces the study of Public Safety. Provides the student with an overview of the requirements necessary to complete a degree in Public Safety; including an overview of faculty expectations and support that is offered to students in this program. Students are introduced to the degree requirements and are guided through the completion of an Individual Academic Plan. Students are introduced to Student Retention Services, Library System and Research, Writing Tutorial Services, and Career Services for assistance in successfully completing projects throughout the course and degree program. Areas of interest include Fire Science, Homeland Security, Environmental Health and Safety, and Emergency Medical Services.

HSPS 104 Introduction to Environmental Technology

3 Credits

Prerequisites: None. Introduce students to the field of environmental technology, the EPA, environmental regulations, toxic and non-toxic hazardous materials and waste. Studies subjects of weapons of mass destruction, birth defects, and the chemistry of acute and chronic ailments. Student will study personal protective equipment (clothing, sampling monitors, etc.) needed to handle hazardous waste and materials, and how to protect personnel in the event of an emergency event.

HSPS 106 Fire Suppression

3 Credits

Prerequisites: None. This course is designed for non-firefighters. An introduction to the fire service. Terminology, history and basic firefighting skills are applied.

HSPS 108 OSHA Regulations

3 Credits

Prerequisites: None. Provides a study of the U. S. Occupational Safety and Health Administration's (OSHA) regulations that pertain to protecting workers from exposure to occupational hazards. Students concentrate on researching, interpreting, summarizing, and applying the OSHA regulations.

HSPS 110 Computer Applications in Homeland Security/Public Safety

3 Credits

Prerequisites: None. A practical application of computer technology for personal and professional productivity. The objective is to use information technology appropriately and fluently to organize, analyze, and communicate information. Topics include hardware, software, office applications, information security and ethics and the Internet. Access to a standard office package, word processing, spreadsheet, database, and presentation software is required.

HSPS 111 Principles of Emergency Management

3 Credits

Prerequisites: None. The purpose of this course is two-fold: to introduce concepts and basic descriptive information about the political system within the context of disaster policy and to demonstrate how political factors play a role in all phases of emergency management—regardless of the type or nature of the disaster event. To achieve these goals the course provides practical information drawn from disaster policy studies and case studies. This information is (wherever possible) reviewed for findings that can be generalized, that is, for lessons that are applicable to future disasters and emergencies.

HSPS 113 Disaster Exercise Program Design

3 Credits

Prerequisites: None. Introduces students to the fundamentals of exercise design and to prepare you to design and conduct a small functional exercise. The concept of the Exercise Design Course is based on one important premise: emergency exercises are worth the effort. Experience and data show that exercises are a practical, efficient, and cost-effective way for a community to prepare for disasters. It includes the value of conducting exercises, the components of a comprehensive exercise program, and the exercise development process development tasks, organization of the design team, exercise documentation, and the steps in designing an exercise. Covers the purpose, characteristics, and requirements of three main types of exercises, table top, functional, and full scale exercises and the evaluation of the exercise.

HSPS 120 Incident Management Systems I

3 Credits

Prerequisites: HSPS 102. Students will learn to emphasize command and control of major department operations at an advanced level, linking operations and safety. Areas of study include National Incident Management System (NIMS), Pre-Incident, Size-up, command systems, Division and Group Functions, Staging, Safety Officer, Command Post, Communications, News Media, Computer Aided Resources. Students will focus on the NIMS 100, 200, 700 and 800 modules.

HSPS 121 Hazmat Awareness and Operations

3 Credits

Prerequisites: None. Introduces hazardous materials for First Responders. Topics include hazardous materials definitions; regulations; statistics; properties and hazards; hazardous materials identification; incident management priorities; strategic goals and tactical objectives; personal protective equipment; contamination and decontamination; incident-specific strategies and tactics; terrorists and other criminal activities.

HSPS 123 Hazardous Materials Technician

4 Credits

Prerequisites: HSPS 121. Students will be introduced to the following situations; hazardous material, managing the hazardous material incident, explosive and gas emergencies, shipping containers, cylinder safety devices, responding to flammable and combustible liquids, oxidizer, poison, and corrosive and radioactive emergencies. Emphasis on chemical identification, marking, storage, shipping and handling of hazardous substances; and uses basic monitoring instruments for hazardous areas to protect workers and first responders. Covers protective clothing and equipment emphasizing safety procedures and practices. Detailed labs are included. On completion of this course the student is eligible to take the national test certification for Hazardous Materials Technician.

HSPS 125 Emergency Medical Responder

3 Credits

Prerequisites: None. Provides students with information necessary to recognize emergency situations; assess the patient on different types of emergencies and apply appropriate emergency care. Covers CPR (Red Cross Professional Rescuer or American Heart Association Health Care Provider), including one and two rescuer, and adult, infant and child resuscitation and Automatic External Defibrillator operation.

HSPS 141 Environmental Management

3 Credits

Prerequisites: None. Introduces students to environmental management and environmental regulations of the EPA. Students will study OSHA and CFRs relating to the environment and different safety regulations published by NIOSH. Environmental enforcement will be discussed and how the government mandates and enforces rules. Students will be introduced to the treatment and disposal of toxic waste and management of weapons of mass destruction and biological warfare.

HSPS 143 Plant Operations – Sanitary

3 Credits

Prerequisites: Program Advisor Approval. Provides the basic principles of aerobic and anaerobic biological treatment processes, including activated sludge, trickling filters, lagoons, sludge handling and disinfection. Reviews state and federal regulations related to wastewater plants.

HSPS 145 Air Quality Management

3 Credits

Prerequisites: None. Introduce the student to air quality management, the contamination of air and the enforcement of rules enacted by the EPA and State regulators. Students will study toxicity, noise pollution, air pollution and global warming and climate weather change.

HSPS 147 Water Quality Management

3 Credits

Prerequisites: None. Introduce the student to the management of water and waterways and the environmental regulations of the Environmental Protection Agency and Occupational Safety and Health Administration. Environmental enforcement will be discussed, along with weapons of mass destruction, biological warfare, and treatment, disposal and storage of toxic wastes. Additionally, students will study water quality issues, waterway resources, contamination, and treatment of water use.

HSPS 149 Environmental Toxicology

3 Credits

Prerequisites: None. Introduces students to the world of environmental toxicology and how it affects the air we breathe, the water we drink and the land we occupy. The different Federal and State rules enacted are studied and how government implements enforcement.

HSPS 160 Fire Apparatus and Equipment

3 Credits

Prerequisites: None. This course examines in detail the various types of apparatus on the market today. Types of apparatus includes pumpers, aerials, elevating platforms and special apparatus. Students utilizing NFPA standards 1901, 1904, and 1500, will identify the proper chapters on a given situation. Topics will include apparatus placement on an emergency incident, types of pumps, tests, equipment, drafting, relay, nozzles, fittings and hose lays, and maintenance on various types of apparatus. Apparatus driving may be covered and practiced. When taken with the Hydraulics class, may prepare student to take IDHS certification test on Pumping Apparatus.

HSPS 161 Fire Fighting Strategy and Tactics

3 Credits

Prerequisites: None. Prepares students to make responsible decisions concerning incident objectives and the development of various strategies and tactics at the company level. Areas covered include pre-incident planning, size up and the development of strategic options. Also, the student will learn basic building construction, fire -behavior, fire control, fire ground factors, fire stream management and support activities. Responsibilities of engine and ladder companies are discussed. Emphasis is placed on safety in all the above areas. Command scenarios are used throughout the course. The NIMS/ICS is used as the Incident Command System of choice.

HSPS 163 Fire Inspection/Code Enforcement

3 Credits

Prerequisites: None. Examines the function of the fire inspector and organization of the fire prevention unit. Emphasize on the identification of the various codes and regulations utilized by the inspector, with special attention given to the Indiana Fire Code and IFSTA Fire Inspection and Code Enforcement. Includes the legal authority governing fire prevention, applications of the fire code, and management's principles as applied to a bureau.

HSPS 165 Fire Fighter I

3 Credits

Prerequisites: None. Fire Fighter I is the introductory course for those students who are seeking certification as a fire fighter. This course will introduce the student to NFPA 1001 which serves as the standard of measurement for all fire fighters in North America. Introduced students to fire service terminology, history and basic firefighting skills needed to complete and pass all requirements designed by the Department of Homeland Security for Basic, Mandatory and Fire Fighter I.

HSPS 167 Fire Fighter II

3 Credits

Prerequisites: HSPS 165. Corequisites: HSPS 165. A companion course to Fire Fighter I and expands upon the principles and techniques of fire fighting. Students will study fire protection systems, firefighter safety and survival. Students will also learn what fire is, the chemical hazards of combustion and related by-products of fire. Fire department organization, administration, operations, and basic strategies and tactics will be covered.

HSPS 169 Fire/Arson Investigator

3 Credits

Prerequisites: None. Students will focus on the responsibility of the firefighter, the investigator, and the department in fire scene investigations. Includes fire cause and loss, collection and preservation of evidence and determination of fire origin, with emphasis on the application of various scientific aids that assist in investigations.

HSPS 170 EPA Regulations

3 Credits

Prerequisite: None. Provides a detailed study of the U. S. Environmental Protection Agency regulations pertaining to hazardous waste management, with an emphasis on the requirements of the Resource Conservation and Recovery Act of 1976, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and the Superfund Amendments and Reauthorization Act of 1986.

HSPS 172 DOT Regulations

3 Credits

Prerequisites: None. Provides a detailed study of the U. S. Department of Transportation (DOT) regulations. Students will be introduced to certain Nuclear Regulatory Commission and Environmental Protection Agency regulations pertinent to hazardous materials transportation. Emphasis is placed on reading, interpreting, and summarizing sections from the Code of Federal regulations.

HSPS 200 Field Study in Homeland Security/Public Safety

1-4 Credits

Prerequisites: None. A field study class is comparable to on-the-job training activities directly related to the Homeland Security/Public Safety program of study.

HSPS 202 Risk Management

3 Credits

Prerequisites: HSPS 102 and Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 Reading Strategies for College or ENGL 095 Integrated Reading and Writing. Provides students with an introduction to industrial safety, OSHA, various OSHA standards, workplace inspections, citations and penalties. Employee and employer responsibilities, right-to-know laws and safety awareness programs are examined. Safety motivation and knowledge, creating a healthy work environment and health hazards and issues are also studied. Areas such as the role of the supervisor, employee assistance programs, management of stress helps students understand the role employer's play in creating a healthy workforce. In addition, the contributions of safety committees and other governmental agencies responsible for safety are examined.

HSPS 204 Homeland Security/Public Safety Building and Infrastructure

3 Credits

Prerequisites: None. The course examines the design principles involved in the protection of a structure from fire involvement. Additionally, the signs, symptoms, and indicators of partial or total building collapse during fire-fighting operations are studied. Incorporates concepts of resiliency at the regional and community levels, into public health and safety, of building design, building fire safety, classification of building construction, infrastructure systems, and in-house fixed fire protection, and environmental sustainability. The requirements of local, state, and federal government and private sector regulations are covered.

HSPS 206 Intelligence Analysis and Security Management

3 Credits

Prerequisites: HSPS 101. This course examines intelligence analysis and its indispensable relationship to the security management of terrorist attacks, man-made disasters, and natural disasters. It also explores vulnerabilities of our national defense and private sectors, as well as the threats posed to these institutions by terrorists, man-made disasters, and natural disasters. Students will discuss substantive issues regarding intelligence support of homeland security measures implemented by the United States and explore how the intelligence community operates.

HSPS 208 Transportation and Border Security

3 Credits

Prerequisites: HSPS 101. This course provides an overview of modern border and transportation security challenges, as well as different methods employed to address these challenges. The course covers a time period from post 9-11 to the present. The course explores topics associated with border security and security for transportation infrastructure, to include: seaports, ships, aircraft, airports, trains, train stations, trucks, highways, bridges, rail lines, pipelines, and buses. The course will include an exploration of technological solutions employed to enhance security of borders and transportation systems. Students will be required to discuss the legal, economic, political, and cultural concerns and impacts associated with transportation and border security. The course provides students with a knowledge level understanding of the variety of challenges inherent in transportation and border security.

HSPS 210 Disaster and Terrorism Awareness

3 Credits

Prerequisites: HSPS 101 and HSPS 111. Disaster and terrorism awareness lays a foundation to assist in addressing the apparent disconnect between the disaster and terrorism communities. A concentration on emergency management develops and understanding the characteristics of each field and emphasizes the importance of communication and collaboration between personnel and operations in these fields.

HSPS 212 Introduction to Mitigation

3 Credits

Prerequisites: HSPS 101, HSPS 111, and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Students and practitioners will gain a comprehensive overview of hazard mitigation. Students will study various Federal Emergency Management Agency guidance documents and sample plans. This course will consist of considerable internet research on the student's part. A major component of the course is researching and writing a hazard mitigation plan.

HSPS 214 Disaster Response and Recovery Operations

3 Credits

Prerequisites: HSPS 101, HSPS 111, and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Focuses on the consideration of future approaches to reducing damage from natural hazards, aimed at breaking the cycle of disaster/rebuilding/disaster through pre-disaster hazard mitigation programs and policies. These proactive approaches seek to stem the tide of losses from repetitive damage incurred by development within known hazard areas, such as floodplains, storm surge areas, and earthquake fault zones. Review of disaster policies that focus on preparation, mitigation, and recovery of past disasters.

HSPS 216 Public Information Officer Course

3 Credits

Prerequisites: HSPS 102. Designed for new or less experienced Public Information Officers including those individuals functioning in the role as a secondary responsibility. Additional application of public information skills to a major emergency or disaster situation will be studied.

HSPS 218 Legal Considerations for Homeland Security/Public Safety

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Provides a general introduction into legal considerations in the fire service. Students can use as a guide to the legal issues associated with the fire service. Technical areas to be covered will be understanding legal issues that are intertwined with the fire service, legal liability, sovereign immunity, overtime laws, collective bargaining, OSHA compliance, worker's compensation, physical abilities testing, medical examinations, drug testing, discrimination, and sexual harassment.

HSPS 220 Incident Management Systems

3 Credits

Prerequisites: HSPS 102 and HSPS 120. Students will learn to emphasize command and control of major department operations at an advanced level, linking operations and safety. Areas of study include National Incident Management System (NIMS), Pre-Incident, Size-up, command systems, Division and Group Functions, Staging, Safety Officer, Command Post, Communications, News Media, Computer Aided Resources. Students will focus on the NIMS 300 and 400 modules.

HSPS 240 Plant Operations – Industrial

3 Credits

Prerequisites: Program Advisor Approval. Covers wastewater treatment processes including coagulation, sedimentation, activated sludge, neutralization, equalizations and cyanide and chromate removal. Students will study instrumentation, maintenance and troubleshooting, including operations, laboratory testing and associated mathematics.

HSPS 242 Hazardous Waste Operations and Emergency Response

3 Credits

Prerequisites: HSPS 121. The HAZWOPER course is specifically designed to give students the necessary information and skills needed if involved in a clean-up operation, voluntary clean-up operations, emergency response operations, and storage, disposal, or treatment of hazardous substances or uncontrolled hazardous waste sites. Topics of study will include protection against hazardous chemicals, elimination of hazardous chemicals, safety of workers, the environment and OSHA regulations. This course covers topics included in 29 CFR 1910.120 and upon successful completion of the course, skills drill and written examination the student will become eligible to receive their 40-hr HAZWOPER certification from EPA.

HSPS 260 Fire Department Specifications

3 Credits

Prerequisites: HSPS 160. Outlines the process used for the purpose of purchasing new fire apparatus or refurbishing existing apparatus. Addresses all associated equipment required on the apparatus in accordance with NFPA Standard 1500 and 1901. In addition the student will learn how the standards are applied during each phase of the bid specification process.

HSPS 262 Fire Protection Systems

3 Credits

Prerequisites: None. Fire Protection Systems provides comprehensive, systematic, and easy to understand information concerning the many different types of protection systems used today. Assists students in becoming more knowledgeable about automatic, manual, electronic, and mechanical based fire protection systems, as well as standpipes and sprinkler systems used for fire protection or in commercial applications. In addition, provides students information in the technical areas covered by these systems and the various extinguishing agents they are capable of using.

HSPS 264 Fire Service Management

3 Credits

Prerequisites: HSPS 102 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 or ENGL 095. Provides students with an educational background in leadership, personal and professional development, working in the community, budget and finance responsibilities, legal issues, intergovernmental relations, effective communication, strategic planning, administrative management, human resources, and functions of line and staff position.

HSPS 266 Fire Service Hydraulics

3 Credits

Prerequisites: HSPS 160 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093 or ENGL 095 and MATH 023 or higher. Provides a foundation of theoretical knowledge in order to understand the principles of the use of water in fire protection and apply hydraulic principles to analyze and solve water supply problems. Applications are related to fire protection systems, fixed and mobile, water supply systems and foam systems. Other areas of study will focus on fluid properties, principles of fluid statics, flow system principles, and other appliances and hydraulic devices.

HSPS 270 Contingency Planning

3 Credits

Prerequisites: HSPS 102. Students learn how to develop an emergency response contingency plan for a facility or community. Preparedness includes analyzing the hazards, writing and implementing the contingency plans, training employees for an emergency, and evaluating the effectiveness of the contingency plan.

HSPS 272 Sampling Procedures

3 Credits

Prerequisites: HSPS 104. Introduces students to a variety of sampling procedures used in industrial settings for emergency response. Topics to be covered include: sampling and monitoring devices, industrial hygiene monitoring, water and waste stream monitoring, outside air sampling, soil and radiation sampling. Emphasis will be placed on collecting and preserving representative samples, interpreting laboratory results, and complying with relevant federal regulations.

HSPS 279 Homeland Security/Public Safety Capstone Course

2 Credits

Prerequisites: Program Advisor Approval. Prepare the student for entry into Homeland Security/Public Safety careers in fields such as public administration, hazardous materials, environmental health and safety management or fire science. Review of procedures for interviewing, team participation, and ethical and productive job performance. Provides students the ability to complete program outcomes assessments and portfolio development.

HSPS 280 Co-Op/Internship in Homeland Security/Public Safety

3 Credits

Prerequisites: Program Advisor Approval and the student must have completed a minimum of 30 credits toward their degree with at least a 3.0 cumulative grade point average. Provides fieldwork experience in an approved agency that is specific to their career objective. Students will gain on-the-job experience while earning credit toward an associate degree.

HSPS 281-283 Special Topics in Homeland Security/Public Safety

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in homeland security/public safety. Identifies and offers various special topics during each term under this course number.

HSPS 285 Special Topics in Homeland Security/Public Safety

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in homeland security/public safety. Identifies and offers various special topics during each term under this course number.

HSPS 288 Special Topics in Homeland Security/Public Safety

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in homeland security/public safety. Identifies and offers various special topics during each term under this course number.

HSPS 292 Special Topics in Homeland Security/Public Safety

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in homeland security/public safety. Identifies and offers various special topics during each term under this course number.

HSPS 294 Special Topics in Homeland Security/Public Safety

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in homeland security/public safety. Identifies and offers various special topics during each term under this course number.

HUMA 100 Theatre Appreciation

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and ENGL 095. Developing understanding, appreciation and critical perceptions of the theatrical event. The course will approach theatre as an art form, an entertainment medium and as a vehicle for self-expression. Emphasis will be placed on the history of theatre, acting, directing, playwriting, theatre technology, costume design, scenic design, and lighting design. Active participation in the playwriting, acting, directing and designing processes will be provided. The course will also require attendance at theatrical events to offer firsthand experience in theatre arts.

HUMA 117 Introduction to Music Theory

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and ENGL 095. Emphasizes the practical learning of basic music skills and will cover fundamental music terminology, notation and structure. Sight singing and listening skills will be developed through examples drawn from a variety of musical styles.

HUMA 118 Music Appreciation

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and ENGL 095. Introduces the student to music with an emphasis on critical listening. Surveys a variety of genres, composers and their compositions. No previous background in music required.

HUMA 201 Humanities: Prehistories Through the Renaissance

3 Credits

Prerequisites: ENGL 111. Introduces the student to a wide variety of unique creations of the individual imagination. The overall purpose of the course is to deepen and broaden the student's enjoyment of the humanistic disciplines at both the level of feeling and the level of understanding from pre-history to the Renaissance.

HUMA 202 Humanities: Renaissance to Present

3 Credits

Prerequisites: ENGL 111. Introduces the student to a wide variety of unique creations of the individual imagination. The overall purpose of the course is to deepen and broaden the student's enjoyment of the humanistic disciplines at both the level of feeling and the level of understanding from the Renaissance to the present.

HUMA 250 Travel Study

3 Credits

Prerequisites: ENGL 111, Program Advisor Approval. This course offers the student an opportunity to research and explore the attributes of another country or region through travel. Students will attend preparatory sessions on travel planning and management, research techniques, cross-cultural communication skills, study and observational methodologies, itinerary development, and post-trip summary, reflection, and application processes. Course may be repeated for credit.

HUMS 101 Introduction to Human Services

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Explores the history of human services, career opportunities, and the role of the human service worker. Focuses on target populations and community agencies designed to meet the needs of various populations.

HUMS 102 Helping Relationship Techniques

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Provides opportunities to increase effectiveness in helping people. Examines the helping process in terms of skills, helping stages, and issues involved in a helping relationship. Second in a series of three introductory human services courses.

HUMS 103 Interviewing and Assessment

3 Credits

Prerequisites: HUMS 101 and HUMS 102. Introduces and develops basic interviewing skills. Includes assessment strategies and treatment planning. Third in a series of three introductory human services courses.

HUMS 104 Crisis Intervention

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Provides beginning training for people who anticipate or are presently working with people in crisis situations.

HUMS 105 Introduction to Correctional Rehabilitation Services

3 Credits

Prerequisites: HUMS 101. Includes a study of crime and how society is affected.

HUMS 108 Psychology of Aging

3 Credits

Prerequisites: PSYC 101. Covers the major behavioral changes in adulthood and aging. Students explore their own feelings about aging as well as the attitudes of society.

HUMS 109 Understanding Diversity

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Introductory course that encourages cultural awareness and appreciation of diversity. Focuses on cultural variations in attitudes, values, language, gestures, and customs. Includes information about major racial and ethnic groups in the United States.

HUMS 110 Women's Issues

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Major issues and social problems related to women through an interdisciplinary analysis of social institutions and movements for social change as they affect women. Focus is on 21st century trends in institutions such as the family, law, medicine, education and other social interaction.

HUMS 113 Problems of Substance Abuse in Society

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Introductory course that provides basic information about the problems of alcohol and other drug abuse. Explores symptoms and effects of abuse and dependence on individuals, families, and society. Course can be used toward NAADAC certification for Addiction Professional in Training.

HUMS 114 Social Services in Long-Term Care

3 Credits

Prerequisites: None. Provides practical and useful information about aging and institutionalization. Focuses on the role of social services within the long-term care facility. Indiana State Department of Health State Certification requires 48 hours of attendance.

HUMS 116 Introduction to Disabilities

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Provides background knowledge of the field of intellectual and developmental disabilities and issues pertaining to the field.

HUMS 120 Health and Aging

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Presents an overview of the physical changes and common pathologies associated with the aging process. Focuses on the psychological and social implication of such changes for human behavior. Throughout the course there is a focus on health promotion and disease prevention during the later years.

HUMS 124 Activity Director Basic

6 Credits

Prerequisites: None. Explores the philosophy and investigates the development of therapeutic activity programs for older persons. Focuses on activities that will meet the individual's physical, social, and emotional needs.

HUMS 130 Social Aspects of Aging

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Covers major theories and patterns of aging in American society. Covers social institutions and cultural factors that affect the aging process.

HUMS 135 Love, Romance and Relationships

3 Credits

Prerequisites: None. Examines the key elements of healthy relationships. Explores the main problems that damage relationships. Presents research findings on successful and unsuccessful relationships. Examines how couples can improve intimacy, romance, and emotional connection. Explores the impact of one's emotional and relationship history on current and future romantic relationships. Presents practical, scientific-based skills for improving relationships.

HUMS 140 Loss and Grief

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Introductory course that provides practical and useful information for people who have experienced loss. Students have the opportunity to evaluate their own experiences and attitudes toward loss and grief.

HUMS 150 Child and Youth Development

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093 or ENGL 095. This course introduces students to the concepts of creating safe and healthy environments for children and youth based on age appropriate youth development. Topics will include structuring age and ability-appropriate activities, promoting good health and nutrition, preventing and reducing injuries, practicing behaviors that contribute to the prevention of illness, and providing safe environments in both indoor and outdoor settings. Students will also learn how to use space, equipment, and materials as resources for creating interesting, secure, and enjoyable environments that encourage interaction, exploration, learning and self-management for both children and youth, including those with special needs.

HUMS 155 Family and Community in Youth Work

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Examines stages of the family life cycle and interpersonal relationships among family members within a context of cultural awareness and appreciation of diversity. Recognizes impact of cultural variations in attitudes, values, language, gestures, and customs upon the family's ability to function. Includes information about major racial and ethnic groups in the United States. Explores basic principles of working with groups and communities.

- HUMS 200 Substance Abuse Internship** **3 Credits**
Prerequisites: HUMS 101, HUMS 102, HUMS 103, HUMS 113, HUMS 208, HUMS 209, HUMS 210. Field work experiences in approved substance abuse services agency. The student will complete 160 hours under the supervision of an agency professional and a college faculty member. The classroom component will include small group discussion and analysis of the internship experience.
- HUMS 201 Internship I** **3 Credits**
Prerequisites: HUMS 101, HUMS 102, and HUMS 103. The first of two fieldwork experiences in approved human service agencies. The student will complete 160 hours under the supervision of an agency professional and a college faculty member. The classroom component will include small group discussion and analysis of the internship experience.
- HUMS 202 Internship II** **3 Credits**
Prerequisites: HUMS 101, HUMS 102, HUMS 103, HUMS 206 and either HUMS 200 or HUMS 201. Corequisite: HUMS 206. The second of two fieldwork experiences in approved human service agencies. The student will complete 160 hours under the supervision of an agency professional and a college faculty member. The classroom component will include small group discussion and analysis of the internship experience.
- HUMS 205 Theories of Behavior Modification** **3 Credits**
Prerequisites: PSYC 101. Advanced level elective course focusing on theories of behavior modification. Develops understanding of terms and practical applications of theoretical approaches used in working with people.
- HUMS 206 Group Process and Skills** **3 Credits**
Prerequisites: HUMS 101, HUMS 102 and HUMS 103. Studies group dynamics, issues and behavior. Includes group functioning and leadership, guidelines on working effectively with a co-leader, and practical ways of evaluating the group processes.
- HUMS 207 Program Planning and Policy Issues** **3 Credits**
Prerequisites: HUMS 101. Concentrates on the components of administration of human service agencies. Addresses practitioner skills needed by an administrator or supervisor. Discusses social policy and its impact on human services.
- HUMS 208 Treatment Models of Substance Abuse** **3 Credits**
Prerequisites: HUMS 113. The course will examine both the historical and current treatment models of substance abuse and the underlying theories shaping each model. Students will be introduced to the skills needed to work in a variety of substance abuse treatment programs. Course can be used toward NAADAC certification for Addiction Professional in Training.
- HUMS 209 Counseling Issues in Substance Abuse** **3 Credits**
Prerequisites: HUMS 113. An examination of the special issues, populations, and treatment modalities specific to substance abuse counseling. Course can be used toward NAADAC certification for Addiction Professional in Training.
- HUMS 210 Issues of Substance Abuse in Family Systems** **3 Credits**
Prerequisites: HUMS 113. This course is designed to increase understanding of the impact addiction has on the family system and methods to work with families to promote recovery. Course can be used toward NAADAC certification for Addiction Professional in Training.
- HUMS 212 Family and Child Welfare** **3 Credits**
Prerequisites: HUMS 101. Examines contemporary problems facing families and children. Evaluates the adequacy of policies, programs, and services in the context of changing lifestyles and social forces impacting the quality of life.
- HUMS 215 Juvenile Delinquency** **3 Credits**
Prerequisites: HUMS 101. Provides an overview of the concepts, definitions, and measurements of juvenile delinquency. Explores various theories that attempt to explain the causes of delinquency. Looks at the role of environmental influences (peers, gangs, school, drugs) as they contribute to delinquency. Discusses an overview of the history and philosophy of the juvenile justice system as well as ways to control and treat juvenile delinquents.
- HUMS 220 Issues and Ethics in Human Services** **3 Credits**
Prerequisites: HUMS 101 and HUMS 102 and HUMS 103. Corequisite: HUMS 103. Advanced level course provides an overview of legal and ethical aspects in the field of human services with implications for the human service worker. Includes topics such as confidentiality, rights of clients, client records, equal protection for staff and clients, and discrimination. The Human Service Ethical Code and related codes are covered with an overview of ethical dimensions of practice.
- HUMS 250 Content and Curriculum in Youth Work** **3 Credits**
Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course examines environments, materials, activities, group skills, and strategies which foster the development of youth and families. The use of observation and group skills in meeting the comprehensive needs of youth and families is explored. Techniques which promote positive relationships, community building, effective communication, conflict resolution, and problem solving skills are reviewed. Students will develop, implement, and assess appropriate activities focusing on content and curriculum.

- HUMS 255 Development of the Youth Professional** **3 Credits**
Prerequisites: HUMS 150, HUMS 155, HUMS 250, HUMS 201, or HUMS 202. This course prepares students to interact with clients and colleagues in a professional manner. Explores issues commonly experienced while working with youth. This course emphasizes ethical considerations in human services and helps prepare students to secure credentialing in the youth worker field.
- HUMS 267 Psychology of Personality** **3 Credits**
Prerequisites: PSYC 101 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. An introductory survey of major theories of personality, personality development, problems, methods, and contemporary theories of adjustment and idiodynamics.
- HUMS 269 Human Development and Ecological Systems** **3 Credits**
Prerequisites: HUMS 101. This course provides an orientation and theoretical background to the understanding of human behavior, utilizing an ecological system framework. It will focus on the development of individuals and families through the life span, with attention to the institutional and societal factors that impede the development and quality of life of diverse populations.
- HUMS 270 Multicultural Practice** **3 Credits**
Prerequisites: HUMS 101. This course examines, from a theoretical and experiential social work perspective, the personal behaviors and institutional factors that have led to oppression of ethnic minorities, persons of color or other oppressed populations and those practices that serve to maintain inter-group tensions. Attention is given to discriminatory practices as related to gender, age, religion, disablement, sexual orientation, culture, etc. It will explore the strategies that the various groups have employed to deal with discrimination. Implications to the individual, society and the profession are explored.
- HUMS 279 Human Services Capstone Course** **2 Credits**
Prerequisites: Program Chair Approval. Provides opportunity for student engagement related to program completion while connecting to the field of human services. Examines program competencies, professional development, ethics and credentialing. Provides for professional assessment and institutional outcome measures.
- HUMS 281 – 294 Special Topics** **1-3 Credits**
Prerequisites: Program Advisor Approval. Discussed topics of current interest in human services. Identifies and offers various special topics during each term under this course number.
- HVAC 100 Introduction to HVAC Technology** **3 Credits**
Prerequisites: None. This course covers many of the topics needed for students to be successful in the mechanical construction industry. Its modules include: history of the HVAC industry, OSHA 10-hour construction industry training, communication and customer service skills, and an introduction to blueprints and other types of mechanical drawings.
- HVAC 101 Heating Fundamentals** **3 Credits**
Prerequisites: None. Introduces fundamentals applicable to the heating phase of air conditioning. Includes types of units, parts, basic controls, functions, and applications. Emphasizes practices, tool and meter use, temperature measurement, heat flow, the combustion process and piping installation practices. Covers the basic sequence of operation for gas, oil and electric furnaces. This course will use lecture, lab and online simulation to prepare students for the nationally recognized certification exam as part of the outcome assessment learning objectives.
- HVAC 103 Refrigeration I** **3 Credits**
Prerequisites: None. Introduction to compression systems used in mechanical refrigeration including the refrigeration cycle and system components. Introduces safety procedures, proper use of tools used to install and service refrigeration equipment, refrigerant charging and recovery, system evacuation, calculating superheat and subcooling and using a refrigerant temperature/pressure chart. This course will use lecture, lab and online simulation to prepare students for the nationally recognized certification exam as part of the outcome assessment learning objectives.
- HVAC 107 Duct Fabrication and Installation** **3 Credits**
Prerequisites: None. Emphasizes reading blueprints common to the sheet metal trade, floor plans, elevations, section, detail and mechanical plans. Requires students to develop a layout of an air conditioning duct system and fittings. Fabrication of these parts, including proper use of hand-tools and shop equipment used to fabricate duct systems and fittings.
- HVAC 120 Basic Carpentry and Building Maintenance** **3 Credits**
Prerequisites: None. Includes carpentry basics, power tool and hand tool safety and use, framing, hanging doors and windows, trim basics, drywall basics, and painting basics.
- HVAC 122 General Maintenance** **3 Credits**
Prerequisites: None. Covers required record keeping, plumbing basics (fixture repair and replacement, piping, basic plumbing code, etc.), major appliance installation and repair, chemical usage and storage, MSDS files, ADA compliance and safety and liability topics.

HVAC 171 Hydronic Heating Systems

3 Credits

Prerequisites: HVAC 101. Students learn the basic components of a hydronics radiant heating system; types of boilers, distribution systems, heat emitters and controls. Students study the properties of water and its used as a heat transfer fluid. Through the use of Radiant Design Software programs students will learn about the unique elements of heat loss calculations when using radiant heating and will design a radiant heating system for a residential/light commercial building. This course will use lecture, lab and online simulation to prepare students for the nationally recognized certification exam as part of the outcome assessment learning objectives.

HVAC 200 Home Automation and Smart Grid Technology

3 Credits

Prerequisites: BCTI 130. We are on the forefront of a newer age of the electrical grid. The plus fifty year old Electrical Grid Infrastructure is making way for the integration of a newer and Smarter Electrical Grid which equates to greater energy savings hundreds if not thousands of new jobs. The rapid growth of internet technology and higher speed modems has paved the way for these changes. Home automation technology and smart grid seems to be a perfect match to joins smart home technology with smart meter technology. The Smart home uses home automation technology to automate and integrate residential systems such as; computer networking, audio/video, security and surveillance, lighting management, HVAC and water control systems. These modules will be covered in this class.

HVAC 201 Cooling Service

3 Credits

Prerequisites: HVAC 103. Covers procedures used to diagnose electrical, control, mechanical and refrigeration problems common to cooling systems. Familiarizes students with using the refrigeration cycle and temperature/pressure charts as diagnostic tools in troubleshooting refrigeration system problems. Includes various methods of checking refrigerant charges, methods for charging air conditioning and refrigeration systems, electrical and refrigeration system components, and schematic and pictorial diagrams.

HVAC 202 Electrical Circuits and Controls

3 Credits

Prerequisites: HVAC 101 and HVAC 103 and BCTI 130. Studies heating, air conditioning and refrigeration controls typically found on residential and light commercial heating and air conditioning equipment. Includes gas, oil and electric heating controls, cooling controls, thermostats, humidistats, aquastats, and electronic controls. Covers operation of controls, integration of controls into controls systems, reading schematic and pictorial diagrams, and component troubleshooting and testing. This course will use lecture, lab and online simulation to prepare students for the nationally recognized certification exam as part of the outcome assessment learning objectives.

HVAC 203 Heat Loss and Gain Calculation

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 015 or FOUN 071. Introduces the student to calculating structural and other heat losses for winter heating, and structural and other heat gains for summer air conditioning using an industry standard method of heat loss and heat gain calculation. Discusses building construction techniques, energy consumption reduction methods and equipment selection.

HVAC 204 Commercial Refrigeration

3 Credits

Prerequisites: HVAC 211. Examines air conditioning and refrigeration systems for commercial use, including medium and low temperature applications. Includes specialized commercial refrigeration and A/C accessories, metering devices, setting pressure controls for direct temperature control, fan cycling and pump down, commercial ice production, methods of low ambient control, and advanced control arrangements. This course will use lecture, lab and online simulation to prepare students for the nationally recognized certification exam as part of the outcome assessment learning objectives.

HVAC 205 Heat Pump Systems

3 Credits

Prerequisites: HVAC 101 and HVAC 103 and INDT 113. Familiarizes students with the refrigeration cycle as it applies to the heat pump system and the different types of heat pump systems. Covers procedures used to diagnose electrical, control, mechanical and refrigeration problems common to heat pump. Includes sizing of heat pumps, specialized heat pump refrigeration components and electrical controls, the air-to-air heat pump defrost cycle, and schematic and pictorial diagrams. This course will use lecture, lab and online simulation to prepare students for the nationally recognized certification exam as part of the outcome assessment learning objectives.

HVAC 206 Advanced Cooling Service

3 Credits

Prerequisites: HVAC 211. Studies methods of troubleshooting electrical and mechanical components of air conditioning and refrigeration systems. This course will use lecture, lab and online simulation to prepare students for the nationally recognized certification exam as part of the outcome assessment learning objectives.

HVAC 207 HVAC Codes

3 Credits

Prerequisites: None. Study of state and local codes covering installation, repair, alteration, relocation, replacement and erection of heating, ventilation, cooling and refrigeration systems. Includes job-related costs of material and equipment, labor, warranty, taxes, permits and subcontracts. Students will estimate service and maintenance contracts.

HVAC 208 Heating Service

3 Credits

Prerequisites: HVAC 101 and CONT 127. Covers procedures used to analyze mechanical and electrical problems encountered when servicing heating systems. Covers electrical schematics and connection diagrams, combustion testing, venting and combustion air requirements, sequence of operation, heating controls, troubleshooting techniques, installation practices, basic codes applying to furnace codes, and service procedures. This course will use lecture, lab and online simulation to prepare students for the nationally recognized certification exam as part of the outcome assessment learning objectives.

HVAC 209 Psychrometrics/Air Distribution

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 015 or FOUN 071. Studies the properties of air during the operational variations of temperature and humidity. Discusses the atmospheric conditions and the impact of those conditions on the heating-cooling and ventilation processes and the design of systems for residential and commercial structures. Includes the sizing and configurations of air delivery duct systems and system design methods.

HVAC 210 Energy Auditing

3 Credits

Prerequisites: HVAC 101, INDT 113 or CONT 127, HVAC 203. This course is an introduction to the science of performing building energy analysis through visual inspections and specialized equipment such as; the Blower Door, Duct Blaster, Infrared Camera, Borescope, Monometer, Anemometer and other inspection and monitoring devices. The course will contain; Laboratory Exercises, Text book study, Power Point, Quizzes and Written Certification Exams. There will be field instruction and training so that the student can become proficient in the use of the various type of diagnostic equipment.

HVAC 211 Refrigeration II

3 Credits

Prerequisites: HVAC 103 and INDT 113 or CONT 127. Continues the study of air conditioning and refrigeration with further study of compressors, metering devices, system charging, refrigerant recovery, equipment installation and an introduction to troubleshooting procedures [electrical, mechanical and refrigeration]. Includes clean-up procedures following compressor burnout and analysis of how a single problem affects the rest of the system. Introduces electrical control systems and electrical motor basics as they apply to air conditioning and refrigeration including motor types, starting components, and motor troubleshooting basics. This course will use lecture, lab and online simulation to prepare students for the nationally recognized certification exam as part of the outcome assessment learning objectives.

HVAC 212 Advanced HVAC Controls

3 Credits

Prerequisites: HVAC 202. Covers systems beyond ordinary residential and single zone commercial applications. Includes solid state controls, 0-10 volt DC and 4-20 milliamp control signals, zoning controls, modulating controls, low ambient controls, heat recovery and energy management controls, economizer controls, 3-phase motor protection modules, variable frequency drives [VFDs], remote sensing electronic thermostats, electronically commutated DC motor control, Direct Digital Control [DDC] systems, multiple-stage heating/cooling controls, PLC control of HVAC/R equipment and pneumatic controls.

HVAC 213 Sales and Service Management

3 Credits

Prerequisites: None. Encompasses the use of blueprints, specifications, application data sheets, bid forms and contracts in estimating materials and labor in the HVAC business. Includes advertising, direct labor, indirect labor, overhead, warranty costs, taxes, permits, subcontracts, margins, mark-ups and profits. Provides students with the opportunity to estimate service contracts and study service organization, service procedures, record keeping, parts inventory control, and liability insurance.

HVAC 214 Applied Design

3 Credits

Prerequisites: None. Provides students with the opportunity to design and lay out complete HVAC systems.

HVAC 215 Heating with Renewable Energy

3 Credits

Prerequisites: CONT 127, or INDT 113. We are on the forefront of a new age of HVAC and Energy Technology. The past 50 to 60 years has shown HVAC at the leading edge of technology broadening its technological base by expanding from window fans, oil, and wood burning stoves, and ice boxes cooled by blocks of ice in the 1950s to an industry of Heating, Cooling and Refrigeration Systems that touch all of our lives in many ways every day. The new leading edge that confronts HVAC Technology is directed toward advancements in renewable energies in the heating, cooling and energy industries. Solar Thermal, Thermal Storage, Geo Thermal, Hydronics, Boiler Design and Mini-split technology will lead the way in this new technological age. Advancements in these fields equates to greater energy savings, and hundreds if not thousands of new jobs. This course will enhance the students understanding and competencies in these technologies.

HVAC 216 Advanced Heat Pump Systems

3 Credits

Prerequisites: HVAC 103. This course reviews the refrigeration cycle as it applies to the heat pump system and different types of heat pump systems. Covers procedures used to diagnose electrical, control, mechanical and refrigeration problems common to water source, geothermal and ductless heat pump systems. Course includes sizing, design and installation of both open and closed loop geothermal heat pumps. Also covered are specialized heat pump systems utilizing variable capacity, inverter technology and variable refrigerant flow technologies.

HVAC 220 Distribution Systems

3 Credits

Prerequisites: HVAC 100 and FOUND 071 . Covers methods used in calculating building heat loss and gain plus how to use this data in sizing equipment and duct systems for residential and light commercial applications. Includes discussion of methods to reduce building heating/cooling loads, air flow principles, air delivery system design methods, and introduces using a psychrometric chart to solve air mixture problems.

HVAC 270 Hydronic Heating Systems II

3 Credits

Prerequisites: HVAC 101. Students will review the basic components of a modern hydronic radiant heating system; types of boilers, distribution systems, heat emitters and controls. Students study the properties of water and its use as a heat transfer fluid, fluid flow in a piping system and hydraulic resistance of piping and fittings. Through the use of Radiant Design Software programs, students will learn about the unique elements of heat loss calculations when using radiant heating and will design a radiant heating system for a residential/light commercial building.

HVAC 271 HVAC Service Projects

3 Credits

Prerequisites: Program Chair Approval. Familiarizes students to the aspect of community service and civic responsibility. The learner will understand the dynamics of how service to one's community can be beneficial to the receiver of services as well as the provider. We will explore different agencies and how services are provided to their clients. The class will culminate with the completion of a service project allowing for the student to gain practical experience in their specialty.

HVAC 272 EPA Refrigerant Certification Course

1 Credit

Prerequisite: None. This course will prepare a student to take an EPA approved refrigerant certification exam.

HVAC 279 Green Awareness (capstone)

1 Credit

Prerequisites: Program Chair Approval. Introduces the learner to the latest material, equipment, and processes used in multi-craft trades, building managers, or anyone interested in understanding the dynamics of energy conservation and management. This course will use lecture, lab and online simulation to prepare students for the nationally recognized certification exam as part of the outcome assessment learning objectives.

HVAC 280 Co-Op/Internship

3 Credit

Prerequisites: Program Advisor Approval. Gives students the opportunity to work at a job site that is specifically related to their career objectives. Provides on-the-job experience while earning credit toward an associate degree.

IMTC 110 Coupling and Alignment

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071. Introduces the concepts of correct alignment of industrial process machinery. Provides instruction in troubleshooting and repair of coupled machines.

IMTC 111 Rigging

3 Credits

Prerequisites: None. Introduces the proper techniques of moving industrial machinery and equipment. Emphasis is placed on proper installation, inspection, safety requirements, and load calculations.

INCO 213 Advanced Insurance Coding

3 Credits

Prerequisites: MEAS 137. Course teaches comprehensive coding skills and guidelines for both ICD-10 and HCPCS Levels I and II coding systems necessary to ensure accurate coding and maximize reimbursement for medical claim processing.

INCO 220 Advanced Insurance Claims Processing

3 Credits

Prerequisites: MEAS 137. Designed to build upon the skills acquired through the prerequisite course, MEAS 137. Introduces additional instruction in medical record extraction and various aspects of insurance processing and follow-up. Provides discussion and additional information in the various insurance programs and in related insurance coding competencies.

INDT 100 Computer Fundamentals for Technology

3 Credits

Prerequisites: None. Designed to integrate computer technology, decision-making and problem-solving skills by using multimedia technology and peripherals. Students will explore technology and the various forms it takes in the industrial world. Software and computer programs will be studied along with their computer applications. Students will also learn basic Windows operating system concepts, word processing, Excel spreadsheets, and research/ communication tools within the College.

INDT 103 Motors and Motor Controls

3 Credits

Prerequisite: INDT 113. A general understanding of common types of electric motors, extending from the small shaded pole fan motors to the large three-phase motors. Topics covered will include motor theory, magnetism and how it affects motor rotation, motor starting components and protective devices for motor circuits. Heat dissipation from a motor, motor slippage, how they are wired to obtain different speeds, and how capacitors affect a motor circuit will be included.

INDT 104 Fluid Power Basics**3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 015 or FOUN 071. Introduces the student to fluid power principles and components. Teaches basic circuit design through the use of symbols and schematic diagrams to build a foundation for career work in fluid power technology.

INDT 105 Industrial Solid State Fundamentals**3 Credits**

Prerequisites: INDT 103 and INDT 113. Studies the fundamentals of solid-state active devices that are used in automated systems. Introduces the student to the theory of basic solid-state devices such as diodes, transistors, and SCR's and applications such as amplifiers, op amps, and switching power supplies. Prepares students to diagnose, repair, verify, and install electronic circuits and systems.

INDT 106 Introduction to the Workplace and Safety**3 Credits**

Prerequisites: None. Introduces basic safety instruction including OSHA requirements and other concerns (MSDS, confined space, lock out/tag out, zero energy state, hazardous materials, storage of flammable materials, storage of fuel gas and high pressure gas cylinders, portable powered tool safety, hand tool safety, record keeping, training, employer enforcement of safety regulations, right to know, etc.). Includes an introduction to measuring instruments, hand tools, portable powered tools, and procedures that are pertinent to the mix of specialties on the campus. Lab projects will be designed to reinforce safety procedures and develop competency levels in using the measuring instruments, hand tools and portable powered tools introduced in the course.

INDT 107 Preventative Maintenance**3 Credits**

Prerequisite: None. Introduces the major purpose of preventative maintenance: to save time and cut costs. The course will study goals such as reducing losses, improving product quality, boosting production efficiency, and increasing profits. Includes an introduction to sound planning, effective scheduling, competent inspection, control and actions at the worksite, and follow-up reporting. Lab projects will be designed to organize materials, tool control, transportation of equipment, sizing up labor requirements.

INDT 108 Metrology**3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 050, or MATH 015, or MATH 023, or FOUN 071. Instructs a student in mechanical precision measurement techniques and. Provides instruction and laboratory experiences in surface plate inspections, optical comparators, hardness testing, and coordinate measuring machines (CMM). Discusses calibration and measurement system analysis.

INDT 109 Measurements and Calibration**3 Credits**

Prerequisites: INDT 113. Provides instruction in the purpose, function and application of oscilloscopes and related instruments.

INDT 111 Rigging**3 Credits**

Prerequisites: None. Introduces the proper techniques of moving industrial machinery and equipment. Emphasis is placed on proper installation, inspection, safety requirements, and load calculations.

INDT 112 Sheet Metal Layout and Design**3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 015, or FOUN 071 Tech Foundations. Examines the procedures used to layout sheet metal components. Presents the proper use of hand and machine tools to fabricate sheet metal projects.

INDT 113 Basic Electricity**3 Credits**

Prerequisites/Corequisites: None. The study of electrical laws and principles pertaining to DC and AC circuits is the focus of the course. Includes current, voltage, resistance, power, inductance, capacitance, and transformers. Stresses use of standard electrical tests, electrical equipment, and troubleshooting procedures. Safety procedures and practices are emphasized.

INDT 114 Introductory Welding**3 Credits**

Prerequisites: None. Provides basic skills and fundamental knowledge in oxy-fuel welding, cutting and brazing, Shield Metal Arc welding, Gas Metal Arc welding and Gas Tungsten Arc welding. This course is designed for beginning welders, auto service and body technicians, and individuals in the HVAC industry. Emphasizes safe practices in oxy-fuel and Arc welding processes.

INDT 120 Metallurgy Fundamentals**3 Credits**

Prerequisites: None. Studies the fundamentals of thermodynamics and reactions occurring in metals subjected to various kinds of heat treatment. Includes classification and properties of metals, chemical and physical metallurgy, theory of alloys, heat treatment principles as applied to ferrous and non-ferrous materials, test to determine uses, heat treatment for steels, special steels, and cast iron, powder metallurgy, and use of gas and electric furnaces and their controls.

INDT 125 Industrial Wiring Principles

3 Credits

Prerequisites: INDT 113. Introduces the National Electrical Code and its application in designing and installing electrical circuits, selecting wiring materials and devices, and choosing wiring methods. Includes electrical safety, terminology, interpretation of electrical symbols used in industrial blueprints, branch and feeder circuit layout, over current protection, conductor sizing, grounding, tool usage, and material/device selection.

INDT 201 Fluid Power Systems (Hydraulics/Pneumatics)

3 Credits

Prerequisites: INDT 104. Introduces the student to more complex fluid power circuits. Requires students to design, analyze and troubleshoot complex circuits using schematic diagrams. Studies detailed construction of typical industrial fluid power components. Teaches students to disassemble and evaluate fluid power components in the lab.

INDT 203 Machine Maintenance/ Installation

3 Credits

Prerequisites: None. Examines the procedures for the removal, repair and installation of machine components. The methods of installation, lubrication practices, and maintenance procedures for industrial machinery are analyzed. Also presented are the techniques involved in the calibration and repair of mechanical devices and the practice in computations pertaining to industrial machinery.

INDT 204 Electrical Circuits

3 Credits

Prerequisites/Corequisites: INDT 103. This course is designed to provide an understanding of circuits using alternating current and the motor operation. The course will provide fundamentals of single and three-phase alternating current. Analysis of series and parallel circuits, containing resistance, inductance, and capacitance will be covered. Transformer applications both single phase and three-phase along with power distribution will be covered. This course will give each student a general understanding of common types of electric motors, extending from the small shaded pole fan motors to the large three-phase motors. Direct current motors will also be covered. The student will receive an education in motor theory, magnetism and how it affects motor rotation, and how capacitors affect a motor circuit will be included.

INDT 205 Programmable Controllers I

3 Credits

Prerequisites: INDT 113. Introduces the basic theory, operation and programming of programmable logic controllers. Demonstrates programming examples, set-up examples and troubleshooting, as well as PLC timing, counting, arithmetic and logic and sequencers.

INDT 206 Programmable Controllers II

3 Credits

Prerequisites: INDT 205. Serves as a further introduction to the field of industrial controls. Students will learn the principles of control systems and how they are applied to a production system to achieve automation. Systems included in the courses are stepper motors, programmable logic controllers, microprocessors, computers and feedback systems. Emphasis is placed on programmable logic controllers and the local area network.

INDT 210 Pumps

3 Credits

Prerequisites: INDT 104. Covers the construction and operation of centrifugal, reciprocating, metering, special, and rotary pumps and their components. Includes procedures of troubleshooting, installation and maintenance.

INDT 211 Industrial Process Control and Instrumentation

3 Credits

Prerequisites: INDT 113. Provides an introduction to the field of instrumentation and covers process variables and the various instruments and devices used to sense, measure, transmit, and control those variables. A study of instrumentation drawings and diagrams is required. The course also introduces control loop systems and control methods.

INDT 212 Programmable Controllers III

3 Credits

Prerequisites: INDT 206. Serves as an introduction to advance topics the field of programmable controllers. Use of the latest technology and software will be stressed. ControlLogix, Operator Interfaces, and Networking will be some of the areas covered. In addition use of special high level functions and I/O modules will be covered such as PID loops, servo control, and use of multiple processors.

INDT 213 Pipe Fitting Basics

3 Credits

Prerequisites: INDT 102 or CONT 106. Acquaints the maintenance technician with a basic foundation and pipe fitting skills necessary to make repairs or layout new pipe. Includes determination of the type and quantity of material needed to complete a task and joining those materials in the proper manner with a minimum of supervision.

INDT 215 Advanced Industrial Mechanicals II

3 Credits

Prerequisites: INDT 103 and INDT 203. Teaches advanced mechanical maintenance skills which specifically include vibration analysis, laser shaft alignment, lubrication oil analysis, pumps, seals, gaskets, and couplings. Half of the semester is also devoted to teaching the basics of heating and air conditioning.

INDT 240 Manufacturing Coatings and Surface Finish

3 Credits

Prerequisites: None. Introduces the student to the industrial coatings technology industry from the manufacture of the materials used to make the coatings, to the application and finishing of the coatings serving the Aviation, Energy, Printing, and Steel industries. Describes the various types of coating equipment, process operations, and safety.

INDT 260 Projects in Manufacturing

3 Credits

Corequisites/Prerequisites: ENGL 111 and MATH 122, or MATH 118, and Program Chair Approval. Requires the student to formally display their knowledge and implementation of a broad range of skills from the Industrial Technology and Automation/Robotics curriculum. Specifically, this course will require students, working in manufacturing teams, to develop and complete a manufacturing project, resulting in a product or service that solves a need.

INDT 273 Electrical Troubleshooting

3 Credits

Prerequisite: None. Presents methods and techniques for troubleshooting appliances, motors, motor controls, relay wiring, commercial wiring and industrial wiring systems.

INDT 279 Industrial Technology Capstone

1 Credit

Prerequisites: Program Chair Approval. This course provides students with the opportunity to develop strong professional presence skills, such as communication, networking, interviewing, and ethical problem solving. In addition, this course will prepare students for the Association of Technology, Management, and Applied Engineering (ATMAE) Certified Technical Professional exam. In this course, students will also take the CAAP (Collegiate Assessment of Academic Proficiency) exam.

INDT 280 Co-op/Internship

1-3 Credits

Prerequisite: Program Advisor Approval. Gives students the opportunity to work at a job site that is specifically related to their career objectives. Provides on-the-job experience while earning credit toward an associate degree.

INFM 109 Informatics Fundamentals

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 or ENGL 095. Introduces the student to terminology, concepts, theory, and fundamental skills used to implement information systems and functions in a wide variety of applications from small to enterprise organizations. Topics include the history of and trends in computing, operating systems, database technology, security, cloud implementations and other concepts associated with applying the principles of good information management to the organization. A brief introduction to word processing and spreadsheets is included as part of a skill set that students will use throughout their careers in informatics.

INFM 181-194 Special Topics in Informatics

1-3 Credits

Prerequisites: Program Chair Approval. Discusses topics of current interest in introductory informatics with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

INFM 209 Informatics and Human-Computer Interaction

3 Credits

Prerequisites: INFM 109. Examines the various needs, uses, and consequences of information technology in organizational contexts and how it involves the study, planning, and design of the interaction between people and computers. Students will discover how problem solving is integrated with information technology including introductions to information representation, relational databases, system design, propositional logic, and cutting-edge technologies. Students will be introduced to the analysis of human factors and the design of computer application interfaces including a perspective of human-computing interaction designs in future technologies. Students will learn the concepts of human-computing interaction with a focus on implementation and testing. Students will be introduced to key social research perspectives, current and historical literature on the use of information and communication technologies.

INFM 219 Business Intelligence, Data Warehousing, and Reporting

3 Credits

Prerequisites: INFM 109 and DBMS 110. Introduces students to technology and techniques used to effectively consolidate, arrange, and analyze vast amounts of data. Data analytics has become a highly sought after skill in many industries. Students will be introduced to data warehousing, business intelligence, and related topics such as decision support systems, data mining, web mining, and customer relationship management. Emphasis is placed on learning how to derive business value from large amounts of data.

INFM 281-294 Advanced Special Topics in Informatics

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in informatics with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

INSE 101 Introduction to Information Systems Security

3 Credits

Prerequisites: CINT 106 and CINT 121. Students will explore the field of information systems security focusing on the technical aspects of the discipline. Students will be introduced to the basic terms, concepts, and buzzwords of computer and network security and best practices, roles and responsibilities of management and security personnel. This course explains the fundamentals of communication, infrastructures, operational security, and methods for preventing attacks, areas of risk management, physical security, and cryptography.

INSE 201 Risk Management/Cyber Terrorism

3 Credits

Prerequisites: INSE 101 and CINT 251. Students will learn principles of incident response and disaster recovery. Students will learn to identify vulnerabilities and take appropriate countermeasures to prevent and mitigate risks to an organization. Students will learn planning, assessing the risks, incident response, contingency planning, and prioritizing systems for disaster recovery. The role of management and the relationships of various members of an organization will be discussed. Students will learn to create a hardened network by developing and implementing policies and procedures, and how to restore a network in the event of a disaster. Discussion will also include cyber terrorism and its prevention and countermeasures.

INSE 202 Advanced Routers/Firewalls

3 Credits

Prerequisites: INSE 101 and CINT 252. Provides an advanced understanding of the fundamental concepts involved in firewalls, routers, intrusion detection, intrusion prevention and VPN's and where they fit into a network security program. Students will learn advanced installation techniques, discuss how to make intelligent choices in firewall and/or router technology, and learn advanced troubleshooting. This course provides a comprehensive look at their use with other network security components and how they combine with DMZs, routers, and VPNs for optimal perimeter security. The student will study such topics as packet filtering, proxy servers, authentication, encryption, and securing host computers. Hands-on practical application will also be included.

INSE 210 Secure Coding Theory and Application

3 Credits

Prerequisites: CINS 121 or CINS 129 or CINS 133. Presents the steps for writing, testing, and deploying good, robust, and security-enhanced code. Subjects covered include: threat modeling, secure code lifecycle, current tools used in the industry, and software maintenance and incident preparedness.

INSE 211 Cryptography

3 Credits

Prerequisite: INSE 101. Students will learn about cryptography as an indispensable resource for implementing strong security in real-world applications. Students will learn why conventional crypto schemes, protocols, and systems are vulnerable. The course will cover the foundations of cryptography using simple mathematical terms: probability, information theory, computational complexity, number theory, and algebraic techniques. The student will assess the strength of several standards and use formal methods to prove their security and efficiency. Students will discuss zero-knowledge protocols: their characteristics, development, arguments, and proofs, symmetrical and asymmetrical encryption, digital signatures, Kerberos, code signing, creation/deployment of strong keys and passwords, Virtual Private Networks, SET, and SSL

INSE 250 Ethical Hacking and Database Management

3 Credits

Prerequisite: INSE 101. The student will continue the knowledge learning in the Certified Ethical Hacker track started in INSE 101 and be introduced to relational database design and management. The student will learn threats and defense mechanisms, web applications and data servers, Linux, Macintosh and Mobile systems, and Secure Network Infrastructures. These topics will help lead the student to sit for the CEH certification exam presented by EC-Council.

INSE 279 Capstone Course

2 Credits

Prerequisites: Program Advisor Approval. Prepare the student for entry into the Information world. Reviews procedures for interviewing, team participation, and ethical and productive job performance. Provides for completing program outcomes assessments.

INSE 280 Co-op/Internship/Externship

1-6 Credits

Prerequisites: Program Advisor Approval. Provides students with the opportunity to work at a job site that is specifically related to their career objectives. Provides on-the-job experience while earning credit toward an associate degree. Fourth semester standing and a cumulative GPA of 2.0 or better is recommended for Internship students.

ITSP 135 Hardware/Software Support

4 Credits

Prerequisites: INFM 109 or CSCI 101. Corequisites: INFM 109 or CSCI 101. Delivers the necessary competencies with hands-on experience in the lab for an entry-level Information Technology professional. Students will have the knowledge required to assemble components based on customer requirements, install, configure and maintain devices/software for end users, understand the basics of networking and security, properly and safely diagnose, resolve and document common hardware and software issues while applying troubleshooting skills. Students will also learn appropriate customer support, understand the basics of virtualization, desktop imaging, and deployment.

ITSP 136 Workforce Preparation: CompTIA A+ Certification

1 Credit

Prerequisites: ITSP 135. Corequisites: ITSP 135. The workforce preparation course is focused on the CompTIA A+ certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exams. Students are required to demonstrate course objectives through the appropriate certification exams preparation materials and completion of the appropriate certification exams at the end of the course. The fee for the certification exams are assessed upon enrollment in the course.

ITSP 165 Frontline IT Customer Service**3 Credits**

Prerequisites: INFM 109. Corequisites: INFM 109. Students will acquire the skills and knowledge needed to provide tier 1 technical support services. The focus will be on utilizing troubleshooting techniques for solving specific end-user problems related to computer training, customization, and other tier 1 computer related support services. Students will learn how to implement hands-on technical support over various media infrastructures: telephones, online by e-mail, and/ or live support software on a website.

ITSP 181-194 Special Topics in Information Technology Support**1-3 Credits**

Prerequisites: Program Advisor Approval. Discusses topics of current interest in introductory information technology support with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

ITSP 215 Mobile/Wireless Computing Support**3 Credits**

Prerequisites: ITSP 135. Develops the student's understanding of radio frequency fundamentals and behavior; the features and functions of wireless local area network components. Included are the skills needed to install, configure, and troubleshoot wireless local area network hardware peripherals. Protocols such as the Institute of Electrical and Electronics Engineers 802.11 radio frequency technologies are investigated including regulations, standards, protocols and devices. Network implementation, network security, and radio frequency site survey/analysis are vital elements of this course.

ITSP 216 Workforce Preparation: Certified Wireless Technology Specialist Certification**3 Credit**

Prerequisites/Corequisites: ITSP 215. The workforce preparation course is focused on the Certified Wireless Technology Specialist certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

ITSP 225 Help Desk Software and Technology Support**3 Credits**

Prerequisites: ITSP 165. Corequisites: ITSP 165. Course covers a broad range of topics and explores various tools user support specialists need when working in the technology support industry. The student will learn troubleshooting and problem solving in working with end users including using common helpdesk software, knowledge bases, and ticket management systems. Additionally, the use of analysis of software/hardware solutions to resolve typical information technology based troubleshooting are practical elements of the course.

ITSP 235 Internet of Things Fundamentals**3 Credits**

Prerequisites/Corequisites: ITSP 135 and SDEV 120. Students shall be able to work with micro hardware and single board controllers, such as Arduino and Raspberry Pi, to connect through a network to store and retrieve databases across devices in a cloud environment to monitor and understand distributed data. Students will ascertain the value created by collecting, communicating, coordinating, and leveraging the data from connected devices. Students will understand strengths and weaknesses of application duty cycle and data rate/data-intensive for continuous recognition applications, battery consumption/low-power design, and range extension techniques including data mining and mesh networking/communication range. Students will understand potential benefits of IoT in robotics, vehicles, health, home, logistics, as well as artificial intelligence and human interfaces including speech, brain computer interfaces, and virtual reality. The fundamental knowledge of IoT can start the path towards IoT certifications such as CISCO Industrial Networking Specialist.

ITSP 281-294 Advanced Special Topics in Information Technology Support**1-3 Credits**

Prerequisites: Program Advisor Approval. Discusses topics of current interest in information technology support with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

IVYT 101 First Year Seminar**1 Credit**

Prerequisites: None. Provides students with an overview of skills and strategies necessary to reach their educational, career, and life objectives. Topics include time management, study skills, learning styles, campus and community resources, critical thinking, utilization of technology, career skills, and diversity in society.

IVYT 102 Information Studies and Research Skills**1 Credit**

Prerequisites: None. Introduces students to a variety of information skills: understanding how information and knowledge is produced and organized; creating a strategy for finding information; using and identifying print and electronic resources; locating and evaluating information found; citing and documenting information appropriately; and understanding issues relating to intellectual freedom and copyright laws.

IVYT 103 Health and Wellness**1 Credit**

Prerequisites: None. Educates students about the importance of fitness/ wellness in their everyday lives. Students will have the opportunity to customize their own behavioral plans for fitness/wellness.

IVYT 104 Critical Thinking**1 Credit**

Prerequisites: None. Assists students in developing critical thinking strategies with academic and workplace applications.

IVYT 105 Managing Personal Finances **1 Credit**

Prerequisites: None. An overview of how to manage personal finances. The course includes information in the areas of personal finances, loans, credit and investing.

IVYT 106 Career Exploration **1 Credit**

Prerequisites: None. Enhances success in college by assisting students in obtaining the skills necessary to identify their life, educational, and career goals, specifically in the area of academic and programmatic offerings that support possible career choices.

IVYT 107 Professional Presence **1 Credit**

Prerequisites: None. Provides students with the opportunity to develop a professional presence in business and social settings. Topics include professional communication, proper etiquette and job attainment skills.

IVYT 108 Academic Portfolio and Project Development and Management **1 Credit**

Prerequisites: None. A study of the basic project and portfolio process and provides students with the opportunity to plan and develop a project or portfolio for academic or professional presentation.

IVYT 109 Online Learning Technologies **1 Credit**

Prerequisites: None. Prepares students to succeed in an online learning environment. The course provides an opportunity to demonstrate intellectual, social, and technical skills through the use of online technologies. This course also prepares students for online learning and training opportunities in the workplace.

IVYT 110 Transfer Success **1 Credit**

Prerequisites: None. Examines the essential skills and information needed for transfer to a four-year institution. Emphasizes developing an individual transfer plan.

IVYT 111 Student Success in University Transfer **1 Credit**

Prerequisites: None. This course provides students with an overview of skills and strategies necessary to successfully complete a degree or certificate from Ivy Tech Community College and to transfer to a four-year institution. Students focus on developing an individualized transfer plan focused on reaching their educational, career, and life objectives.

IVYT 112 Student Success in Health Care **1 Credit**

Prerequisites: None. This course provides students with an overview of skills and strategies necessary to reach their educational, career, and life objectives. Topics include time management, study skills, learning styles, campus and community resources, critical thinking, utilization of technology, career skills, and diversity in society.

IVYT 113 Student Success in Technology **1 Credit**

Prerequisites: None. This course provides School of Technology students with an overview of skills and strategies necessary to reach their educational, career, and life objectives. Topics include time management, study skills, learning styles, campus and community resources, critical thinking, utilization of technology, career skills, and diversity in society.

IVYT 114 Student Success in Business **1 Credit**

Prerequisites: None. This course provides students with an overview of skills and strategies necessary to reach their educational, career, and life objectives. Topics include time management, study skills, learning styles, campus and community resources, critical thinking, and utilization of technology, career skills, and diversity in society.

IVYT 115 Student Success in Computing and Informatics **1 Credit**

Prerequisites: None. This course provides students with an overview of skills and strategies necessary to reach their educational, career, and life objectives. Topics include time management, study skills, learning styles, campus and community resources, critical thinking, and utilization of technology, career skills, and diversity in society.

IVYT 116 Student Success in Public Service **1 Credit**

Prerequisites: None. This course provides students with an overview of skills and strategies necessary to reach their educational, career, and life objectives. Topics include time management, study skills, learning styles, campus and community resources, critical thinking, and utilization of technology, career skills, and diversity in society.

IVYT 120 New Student Seminar **3 Credits**

Prerequisites: None. Enhances success in college by assisting students in obtaining skills necessary to educational, career, and life objectives. Students will create and apply critical thinking strategies in areas of time management, media literacy, learning styles, study skills, career planning, money management, resource utilization.

IVYT 171 Leadership

1 Credit

Prerequisite: None. This course provides emerging and existing leaders the opportunity to explore the concept of leadership and to develop and improve their leadership skills. The course integrates readings from the humanities, experiential exercises, films, and contemporary readings on leadership. *Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.*

IYDP 101 Child and Youth Development

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course examines the physical, social, emotional, cognitive, and moral development of children and youth. Theories of child development, biological and environmental foundations of development, and the study of children/youth through observation and assessment strategies are explored. The influence of diversity issues is discussed in relation to developmentally appropriate behavior as well as pro-social and anti-social behavior. Strategies for building positive relationships and self-regulated behavior are addressed in addition to support from community and professional resources. Observation and assessment of children/youth in environmental settings may be required.

IYDP 102 Families and Communities

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Examines stages of the family life cycle and interpersonal relationships among family members within a context of cultural awareness and appreciation of diversity. Recognizes impact of cultural variations in attitudes, values, language, gestures, and customs upon the family's ability to function. Includes information about major racial and ethnic groups in the United States. Explores basic principles of working with groups.

IYDP 103 Health and Safe Environment

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course introduces students to the concepts of creating safe and healthy environments for children and youth. Topics will include structuring age and ability-appropriate activities, promoting good health and nutrition, preventing and reducing injuries, practicing behaviors that contribute to the prevention of illness, and providing safe environments in both indoor and outdoor settings. Students will also learn how to use space, equipment, and materials as resources for creating interesting, secure, and enjoyable environments that encourage interaction, exploration, learning and self-management for both children and youth, including those with special needs.

IYDP 104 Content and Curriculum for the Youth Professional

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course examines environments, materials, activities, group skills, and strategies which foster the development of youth and families. The use of observation and group skills in meeting the comprehensive needs of youth and families is explored. Techniques which promote positive relationships, community building, effective communication, conflict resolution, and problem solving skills are reviewed. Students will develop, implement, and assess appropriate activities.

IYDP 115 Development for the Youth Professional

3 Credits

Prerequisites: IYDP 101, IYDP 102, IYDP 103, IYDP 104, IYDP 280, or HUMS 201, or HUMS 202. This course prepares students to interact with clients and colleagues in a professional manner. Explores issues commonly experienced while working with youth. This course emphasizes ethical considerations in human services and helps prepare students to secure credentialing in the youth worker field.

IYDP 120 Foundations of the Human Services Profession

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Explores the history of human services, career opportunities, practice theory, and the role of the human service worker. Reviews community agencies designed to meet the needs of various populations. Examines the characteristics of an effective helping relationship and the components of establishing therapeutic relationships with youth and their families.

IYDP 201 Indiana Youth Development Professional Internship

3 Credits

Prerequisites: IYDP 101 and IYDP 102 and IYDP 103. A field work experience in an approved agency providing services to youth, ages 5 to 18. The student will complete 160 hours under the supervision of an agency professional and a college faculty member. The classroom component will include small group discussion and analysis of the internship experience.

IYDP 202 Indiana Youth Development Professional Internship II

3 Credits

Prerequisites: IYDP 120, IYDP 203 and IYDP 201. The second of two fieldwork experiences in approved human service agencies. The student will complete 160 hours under the supervision of an agency professional and a college faculty member. The classroom component will include small group discussion and analysis of the internship experience.

IYDP 203 Application of Human Services

3 Credits

Prerequisites: IYDP 120. Introduces and develops basic interviewing skills. Includes assessment strategies, treatment planning, individual and group dynamics. Application of skills to work effectively with youth, families, and youth providers.

LAND 101 Landscape Trees **3 Credits**

Prerequisites: None. Identification of shade, ornamental, and evergreen trees. Including evaluating species quality, growth habits, site adaptability; covers 125 species important to landscaping tree care.

LAND 102 Shrubs and Other Plants **3 Credits**

Prerequisites: None. The identification of 125 shrubs, vines, ground covers, and herbaceous plants important to landscaping including evaluation of growth habits, species quality, and site adaptability.

LAND 103 Landscape Management I **3 Credits**

Prerequisites: None. Methods in the practice of landscaping, tree care, and turf management are briefly introduced through lectures, slides, videos, and field trips. Weed problems and their control are studied. A large segment of the course is devoted to the study of non-pathogenic problems of landscape plants and turf as well as their pathogenic diseases, and management of these problems.

LAND 104 Turf Management **3 Credits**

Prerequisites: None. A study of the particular growth characteristics of the grass species used in lawn areas in the Midwest and Great Lakes area. Also covers the competitive influences and how to control these problems and promote good turf.

LAND 105 Landscape Botany **3 Credits**

Prerequisites: Program Chair Approval. The study of the life of a plant; cell structure; the structure and function of roots, stems, leaves, flowers, and seeds; the assimilation of water and nutrients in the plants growth and the stages of development as well as the place and importance of soils. This class is important to one seeking qualification as a licensed pesticide applicator.

LAND 106 Landscape Design I **3 Credits**

Prerequisites: LAND 101 and LAND 102. Landscape drafting techniques and basic landscape planning for residential and small business settings utilizing the proper selection of ornamental plants consistent with design and environmental requirements. Included are lectures, slide and film presentations, and lab work with drafting tools and equipment.

LAND 201 Landscape Management II **3 Credits**

Prerequisites: LAND 103. Takes advantage of growing season experiences to reinforce what is taught in the prerequisite course by textbook and lecture. Actual on-site observation, as well as hands on experience is planned. Actual practice in the monitoring of pest problems is given.

LAND 202 Landscape Design II **3 Credits**

Prerequisites: LAND 106. A follow up to Landscape Design I to show and give practice in somewhat more sophisticated techniques such as enhancement of drawing by color-use. Also, guidance and practice in making elevation drawings is given. Some introduction to the use of computer-aided drawings is given to the student.

LAND 203 Insect Pests of Ornamentals **3 Credits**

Prerequisites: Program Chair Approval. Covers insect identification, structure, and life history; pest management of insects important to landscaping and tree care.

LAND 204 Herbaceous Ornamentals and Grasses **3 Credits**

Prerequisites: Program Chair Approval. The identification of 125 annuals, perennials, and grasses that is important to landscape management. Slides and videos are used to introduce a list of non-woody plants which students may encounter in operating a landscape business. Bed principles for effective landscape displays will be covered. Cultural practices propagation technique, foliage, and flower descriptions, watering, disease and insects are discussed.

LAND 205 Tree Care Practices **3 Credits**

Prerequisites: LAND 101. Covers the basic knowledge and techniques used by one employed as an arborist in the care of larger mature trees. Includes climbing, pruning, takedowns, removals, soil relationships and fertilization, tools and equipment, and safety procedures.

LAND 206 Fundamentals of Horticulture **3 Credits**

Prerequisites: Program Chair Approval. Studies the basic horticulture of plant structure, growth, function, and development, including propagation, maintenance, and selection. Studies will include use of fertilization and pesticides for the control of diseases and pests.

LAND 207 Soils **3 Credits**

Prerequisites: None. Studies the growth habits and culture of plants not particularly ornamental or frequently used in the landscape. However, knowledge of these plants will be useful to one employed in a garden center or service organization where this person is frequently expected to know answers to questions pertaining to gardening and horticulture.

LEGS 101 Introduction to Legal Studies

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Introduction to Legal Studies will provide the student a broad understanding of the American legal system. Students will engage with and learn about the various court structures, the key players within the system and how our laws and rules are made, enforced, interpreted, and applied. This course also dives into substantive legal topics and allows the student a hands-on education regarding legal research, legal writing, case briefing, interviewing skills, and profession ethics, among other topics.

LEGS 103 Civil Procedure

3 Credits

Prerequisites: LEGS 101. The first of two semesters devoted to the study of the Indiana Trial rules, small claims, court rules, and local rules. (The second course is PARA 202 Litigation) This course focuses on knowing the Rules of Civil Procedure applicable to each part of a case. Topics include filing requirements, the rules regarding service of process, calculation of deadlines, motion practice, discovery, trials, and relief from judgments.

LEGS 170 Legal Ethics

3 Credits

Prerequisites: None. Legal Ethics examines rules of professional conduct that apply to all legal professions including: the American Bar Association Model Rules of Professional Conduct, the Indiana Rules of Professional Conduct, the American Bar Association Guidelines for the Utilization of Legal Assistants; and various other sets of rules of conduct created by paralegal associations.

LEGS 202 Litigation

3 Credits

Prerequisites: LEGS 101 and LEGS 103. The study of Indiana trial rules pertaining to actual trial. Topics include the discovery process and discovery tools, litigation support—including organization and retrieval of trial documents—techniques in preparing witnesses for trial, and preparing jury instructions. The main project is compiling a trial notebook.

LEGS 226 Media and the Law

3 Credits

Prerequisites: Program Chair Approval. Media and the Law is designed as an in-depth investigation of a case or cases that have received substantial media attention. Students will examine the media's presentation of the case and discuss how that aligns with or differs from our court system and its processes. Course is designed to allow students to take a leadership role in the course and with a focus on improving critical-thinking skills.

LEGS 228 Wrongful Conviction

3 Credits

Prerequisites: Program Chair Approval. The Wrongful Conviction course will be a service learning opportunity, designed specifically for our evening students who are not be able to participate in our daytime practicum program. In this course, students will explore the three major areas giving rise to claims of wrongful conviction by reviewing case, constitutional and statutory law. In addition, students will be given issues to investigate related to an active case.

LEGS 279 Capstone Course in Legal Studies

2 Credits

Prerequisites: LEGS 101. This course was designed to review curricular topics in preparation for students to transfer to a four-year college or university. This course will help sharpen writing and critical analysis skills and review various areas of law that are tested.

LIBA 279 Liberal Arts Capstone Course

1 Credit

Prerequisites: Successful completion of 40 program hours and Program Advisor approval. Provides a culminating experience designed to demonstrate the student's mastery of information literacy; ethical and responsible behavior; political, social and environmental responsibility; and diversity awareness, both in general and in the student's area of interest. May require a research project, presentation, and/or portfolio. Requires students to complete two sections of a college-approved standardized assessment of proficiency in math, writing, scientific inquiry, and/or critical thinking.

LIBR 101 Introduction to Library Public Services

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Surveys the history, organization, services, and functions of libraries. Provides Library Technical Assistant students with an introduction to and overview of the field and of the different types of libraries.

LIBR 103 Introduction to Libraries Public Services

2 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course gives an overview of the role of the Library Technical Assistant (LTA) in access service areas of a library. Emphasis is placed on circulation, interlibrary loan, and customer service. The course also covers knowledge and use of classification schemes, copyright, reserve services, confidentiality, serials, special collections, collection maintenance, financial transactions and record keeping.

LIBR 104 Introduction to Technical Services

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course is designed to prepare Library Technical Assistants with the skills necessary to assist in acquisitions and processing, serials control, resource preservation and maintenance. Emphasis will be placed on processes necessary for seamless incorporation of technical services into library services delivered to library users. This course has a 16 hour service learning project in a community-based organization.

LIBR 105 Library Technology

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course covers the technology skills and knowledge necessary for library work. Addresses the role of providing assistance and education to library users in the use of technologies and equipment relevant to seeking and accessing information.

LIBR 200 Introduction to Reference Sources and Services

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course gives an overview of the reference function with emphasis on the role of the LTA. Reference interview techniques, are introduced. The course also covers knowledge, use, and evaluation of basic reference tools and sources in all formats, basic search strategy, and referral and interlibrary loan procedures. Emphasis is placed on using this knowledge and skills to help library users locate needed information. Bibliographic and citation formats, legal issues, and ethics are covered.

LIBR 201 Cataloging and Classification

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course introduces students to the basic concepts of classification and cataloging within a library setting. Emphasis is placed on the development of a working knowledge of both descriptive and subject cataloging resources, Library of Congress and Dewey Decimal classification systems, copy cataloging, and MARC format.

LIBR 202 Electronic Resources and Online Searching

2 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course introduces students to essential electronic information sources (library catalogs, digital libraries, academic or gated databases, government resources, and the Internet) used in a variety of library environments, along with the online searching skills needed for effective use. The course emphasizes hands-on training with resources available in Indiana (through INSPIRE and Ivy Tech's Virtual Library online library resources), Boolean logic and other search strategies, copyright issues regarding digital information, retrieving, evaluating and citing information.

LIBR 203 Library Services for Children

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course gives an overview of the materials and services for children and young adults in a public library with emphasis on the role of the LTA. Emphasis is placed on developing a working knowledge of programming for youth ages 0-17. This course will also provide an overview of children's literature, both classic and contemporary, and reference resources that will assist the LTA in providing reader's advisory to youth.

LIBR 204 Library Media Center Operations and Services

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. This course provides an overview of the role of the Library Technical Assistant (LTA) in a school library media center by offering an introduction to the purposes, functions, services, and organizational structure of school library media centers. Basic materials, policies, procedures, philosophies, terminology, and services that make up today's media center services will be covered. A variety of activities will be included, such as field trips, online and written presentations, and group discussions and projects.

LIBR 206 Library Assistant Practicum

3 Credits

Prerequisites: LIBR 101, LIBR 103, LIBR 104, LIBR 105, LIBR 200, LIBR 201, plus regional LTA advisor/program chair permission. Students will gain new and varied support staff experiences compatible with his/her career plans, completed coursework and past work. The student will complete 144 hours under the supervision of a professional librarian in a library. A college LTA faculty member will share the supervision responsibility. The student will gain new and varied support staff experiences compatible with his/her career plans, completed coursework and past work history. Student will keep a journal to reflect on and share the experience with the faculty supervisor and may share with other interns through online discussion. Special emphasis will also be put on workplace survival skills and job seeking skills through additional review and assignments. The culminating project will be submission of a program portfolio representing all the skills and knowledge acquired during the LTA program.

LIBR 207 Management and Supervision in Public Libraries

3 Credits

Prerequisites: LIBR 101 and LIBR 103 and LIBR 104 or three years relevant experience working in public libraries documented by a supervisor. Introduces basic concepts of management supervision as they relate to public libraries. Topics include management and organizational theory, planning, governance, policy making, budgeting, human resources, cooperation and collaboration with other libraries, community relations and marketing the library.

LIBR 208 Development and Management of Library Collections

3 Credits

Prerequisites: LIBR 101 and LIBR 103 and LIBR 104 or two years demonstrated experience working in public libraries using a form signed by employer. Covers the basics of collection development and management including community analysis; the selection, acquisition, and processing of materials; collection assessment, and promotion and the handling of user complaints. Students should be able to use spreadsheets to create reports with supporting charts and tables.

LIBR 281-284 Special Topics

1-3 Credits

Prerequisites: Program Advisor approval. Discusses topics of current interest in Library Technical Assistant. Identifies and offers various special topics during each term under this course number.

LOGM 127 Introduction to Logistics

3 Credits

Prerequisites: None. A study of the basic concepts included in the field of logistics and supply chain management. Topics covered include: supply chain management, customer service, transportation, purchasing, inventory, and warehouse management.

LOGM 201 Lean Manufacturing

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 and MATH 023. Introduces the philosophical background, historical development, fundamental concepts, operating fundamentals, and the organizational rationale for the implementation of lean disciplines in manufacturing. The course also applies to the application of lean disciplines and concepts to service and support industries. The use and implementation of lean disciplines has generally resulted in the ability of an enterprise to develop a work environment that promotes continuous improvement, eliminates waste, reduces operating cost, improves quality, and achieves measurable improvement in customer satisfaction.

LOGM 227 Logistics/Supply Chain Management

3 Credits

A study of the strategic supply chain concepts included in the field of logistics and supply chain management. Topics covered include: supply chain strategy, planning and design, customer service, transportation, purchasing, forecasting, inventory and warehouse management. Also discussed are global supply chain management, managing supply chain risk and financial control of logistics performance.

LOGM 228 Principles of Procurement

3 Credits

Prerequisites: None. Corequisites: None. This course is designed to teach the basics of procurement management. Topics covered include: the challenge of procurement and materials management, objectives and organization, function, specification, quality control and inspection, supplier evaluation, selection, and measurement, supplier development, strategic cost management, contracts and negotiation, procurement relationships, procurement transportation, procurement laws and ethics, and global sourcing.

LOGM 229 Transportation Systems

3 Credits

Prerequisites: BUSN 101. Transportation Systems examines the structure and importance of the commercial transportation industry in the logistics sector of business. Topics covered include an in-depth examination of the various modes of transportation including discussions of regulations, economics, characteristics, and development in major transportation modes. Also discussed are costing and pricing issues in transportation and relationship management between buyers and sellers of transportation.

LOGM 267 Operations Management

3 Credits

Prerequisites: None. Operations Management is a study of the efficient production of goods and services that will satisfy the wants and needs of identified customer groups. The course begins with a more detailed description of what Operations Management is, then moves to an examination of the customer and methods for determining customer demand.

LOGM 280 Supply Chain Management and Logistics Co-op/Internship/Externship

1-5 Credits

Prerequisites: Program Advisor Approval. Prepares the student for entry into their respective field of Supply Chain Management and Logistics with the opportunity to work in a supply chain or logistical environment that is specifically related to their career objectives. Students gain on-the-job experience while earning credit toward an associate degree.

LOGM 281 – 294 Special Topics

1-3 Credits

Prerequisite: Program Chair Approval. Discusses topics of current interest in supply chain management/logistics. Identifies and offers various special topics during each term under this course number.

MATH 015 Fundamentals of Algebra I

5 Credits

Prerequisites: IVYT 101 or IVYT 120 and demonstrated competency through appropriate assessment or a grade of "C" or better in MATH 040. Corequisites: IVYT 101 or IVYT 120. Concentrates on basic operations with fractions, integers, exponents, proportional reasoning, basic linear and literal equations, algebraic expressions, and linear graphs. Includes a variety of applications of these topics.

MATH 023 Essentials of Algebra I

3 Credits

Prerequisites: IVYT 101 or IVYT 111 or IVYT 112 or IVYT 113 or IVYT 114 or IVYT 115 or IVYT 116 or IVYT 120, and demonstrated math competency through appropriate assessment, and demonstrated reading competency through appropriate assessment or successful completion of ENGL 083 or ENGL 095. Corequisites: IVYT 101 or IVYT 120. Reviews signed numbers and basic linear equations. Concentrates on integer exponents, scientific notation, linear equations and inequalities, literal equations, polynomial operations, polynomial factoring, graphing linear equations, and applications.

MATH 035 Fundamentals of Algebra II

5 Credits

Prerequisites: IVYT 101 or IVYT 120 and demonstrated competency through appropriate assessment or a grade of "C" or better in MATH 015 or MATH 023 or MATH 050. Corequisites: IVYT 101 or IVYT 120. Reviews basic operations of polynomials, linear equations and inequalities, and graphing linear equations. An in-depth study of factoring algebraic expressions, properties of rational equations, systems of equations, rational exponents and radicals, quadratics and functions and their graphs.

MATH 043 Essentials of Algebra II

3 Credits

Prerequisites: IVYT 101 or IVYT 120 and demonstrated competency through appropriate assessment or a grade of "C" or better in MATH 023 or MATH 050. Corequisites: IVYT 101 or IVYT 120. Reviews operations with polynomials, linear equations, inequalities, graphing, factoring algebraic expressions. Concentrates on properties of integer and rational exponents and equations, systems of linear equations, radicals, radical equations, quadratic equations, functions including their graphs, and applications.

MATH 080 Mathematical Principles

3 Credits

Prerequisites: IVYT 101 or IVYT 111 or IVYT 112 or IVYT 113 or IVYT 114 or IVYT 115 s or IVYT 116 or IVYT 120 and demonstrated reading competency through appropriate assessment or successful completion of ENGL 083 or ENGL 095. Corequisites: MATH 123 and IVYT 101 or IVYT 120. Concentrates on percents, proportions, measurement, exponents, linear equations, formulas, descriptive statistics, vocabulary and applications. Designed to support students for success in MATH 123.

MATH 100 Intermediate Algebra

3 Credits

Prerequisites: IVYT 101 or IVYT 111 or IVYT 112 or IVYT 113 or IVYT 114 or IVYT 115 or IVYT 116 or IVYT 120 and demonstrated competency through appropriate assessment, or a grade of "C" or better in MATH 023. Corequisites: IVYT 101 or IVYT 120. Reviews linear equations, inequalities, graphing, and factoring algebraic expressions. Concentrates on properties of integer and rational exponents, systems of linear equations, radicals, radical equations, quadratic equations, functions including their graphs, and applications. Successful completion of this course does not meet ITCC math requirements for graduation.

MATH 117 The Art of Geometry

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or a grade of "C" or better in MATH 023. Course emphasizes visualization and appreciation of the beauty of mathematics through geometry; translates between visual and symbolic representations of objects used in art and design; applies mappings, symmetry, similarity, vectors, and geometric constructions of shapes to working with 2D and 3D figures; uses geometry software, hands-on techniques and models.

MATH 118 Concepts in Mathematics

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or a grade of "C" or better in MATH 023 or MATH 080. Corequisite: MATH 080. Through real world approaches, presents mathematical concepts of measurement, proportion, interest, equations and inequalities, probability and statistics. Brief survey of college mathematics.

MATH 121 Geometry-Trigonometry

3 Credits

Prerequisites: Successful completion of MATH 111 or demonstrated competency through appropriate assessment or a grade of "C" or better in MATH 023 or MATH 035. Includes polygons, similar figures, geometric solids, properties of circles, constructions, right triangles, angle measurements in radians and degrees, trigonometric functions and their application to right triangles, Pythagorean Theorem, laws of sine and cosine, graphing of trigonometric functions, trigonometric identities, vectors and polar coordinates. Introductory study of geometry and trigonometry.

MATH 122 Applied Technical Mathematics

3 Credits

Prerequisites: Competency as demonstrated through the placement and diagnostic tests, or by satisfactorily completing developmental ENGL and MATH courses. This course is designed to help students develop mathematical reasoning and real-world skills in analyzing verbal and written descriptions, translating them into algebraic, geometric, trigonometric and statistical statements and applying them to solve problems in fabrication, manufacturing, and business.

MATH 123 Quantitative Reasoning

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or a grade of "C" or better in MATH 080 or successful completion of MATH 127, MATH 128, MATH 129 or MATH 141. Corequisites: Demonstrated competency through appropriate assessment or a grade of "C" or higher in MATH 080. Introduces students to the mathematics required for informed citizenship, decision making, reasoning from evidence, working with real world data, and effective communication. Students will solve problems using proportional reasoning, percentages, rates of change, linear and exponential models with applications from statistics and finance.

MATH 127 Mathematics for Elementary Education I

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023. The course gives a theoretical treatment of common topics underlying an elementary mathematics curriculum. This course covers topics in elementary number theory. Students will be encouraged to explore, make and debate conjectures, build connections among concepts, and solve problems from their explorations. The selection of topics presented in this course is based upon standards and recommendations for the mathematical content knowledge essential for prospective teachers made by the National Council of Teachers of Mathematics.

MATH 128 Mathematics for Elementary Education II

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or a grade of "C" or better in MATH 023. This course gives a theoretical treatment of common topics underlying an elementary mathematics curriculum. This course covers algebraic equations, probability, and statistics. Students will be encouraged to explore, make and debate conjectures, build connections among concepts, and solve problems from their explorations. The selection of topics presented in this course is based upon standards and recommendations for the mathematical content knowledge essential for prospective teachers made by the National Council of Teachers of Mathematics.

MATH 129 Mathematics for Elementary Education III

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023. The course gives a theoretical treatment of common topics underlying an elementary mathematics curriculum. This course covers plane and solid geometry, and measurement. Students will be encouraged to explore, make and debate conjectures, build connections among concepts, and solve problems from their explorations. The selection of topics presented in this course is based upon standards and recommendations for the mathematical content knowledge essential for prospective teachers made by the National Council of Teachers of Mathematics.

MATH 135 Finite Math

Transfer IN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or successful completion of MATH 100. Surveys solving and graphing linear equations and inequalities, elementary set theory, matrices and their applications, linear programming, and elementary probability. A standard finite mathematics course.

MATH 136 College Algebra

Transfer IN 3 Credits

Prerequisite: Demonstrated competency through appropriate assessment or successful completion of MATH 100. Presents an in-depth study of functions, quadratic, polynomial, radical, and rational equations, radicals, complex numbers, absolute value equations and inequalities, rational fractions and exponential and logarithmic functions. MATH 136 and MATH 137 together comprise a standard two-semester college algebra and trigonometry course. *Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.*

MATH 137 Trigonometry with Analytic Geometry

Transfer IN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or successful completion of MATH 100. Presents an in-depth study of right triangle trigonometry, oblique triangles, vectors, graphs of trigonometric functions, trigonometric identities and equations and complex numbers in rectangular and polar/trigonometric forms, rectangular and polar coordinates and conics. *Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.*

MATH 141 Mathematics for Elementary Teachers

4 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 100. A theoretical study of common topics underlying an elementary mathematics curriculum including elementary number theory and operations with integers, fractions and decimals. Students will make and justify conjectures, build connections among concepts and solve problems from their explorations. Use of mathematical terminology, models and concrete manipulatives is included.

MATH 200 Statistics

3 Credits

Prerequisites: MATH 135 or MATH 136. Provides study in the collection, interpretation and presentation of descriptive and inferential statistics, including measures of central tendency, probability, binomial and normal distributions, hypothesis testing of one-and two-sample populations, confidence intervals, chi-square testing, correlation, data description and graphical representations. An introductory statistics course.

MATH 201 Brief Calculus I

Transfer IN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or MATH 136. An introductory course in calculus. Fundamental concepts and operations of calculus including algebraic, exponential and logarithmic functions: limits, continuity, derivatives, points-of-inflection, first-derivative test, concavity, second-derivative test, optimization, antiderivatives, integration by substitution, and elementary applications of the derivative and of the definite integral.

MATH 202 Brief Calculus II

Transfer IN 3 Credits

Prerequisites: MATH 201. Continuation of MATH 201 Brief Calculus. Covers topics in elementary differential equations, calculus of functions of several variables and infinite series.

MATH 211 Calculus I

Transfer IN 4 Credits

Prerequisites: Demonstrated competency through appropriate assessment or successful completion of MATH 131 and MATH 132 or MATH 133 and MATH 134 or MATH 136 and MATH 137. Reviews the concepts of exponential, logarithmic and inverse functions. Studies in depth the fundamental concepts and operations of calculus including limits, continuity, differentiation including implicit and logarithmic differentiation. Applies differential calculus to solve problems in the natural and social sciences, to solve estimation problems and to solve optimization problems. Applies differential calculus to sketch curves and to identify local and global extrema, inflection points, increasing/decreasing behavior, concavity, behavior at infinity, horizontal and vertical tangents and asymptotes, and slant asymptotes. Applies the concept of Riemann sums and antiderivatives to find Riemann integrals. Applies the fundamental theorem of calculus to solve initial value problems, and to find areas and volumes and the average values of a function

MATH 212 Calculus II**Transfer IN 4 Credits**

Prerequisites: MATH 211. Studies the techniques of substitution, integration by parts, trigonometric integrals, partial fractions and trigonometric substitution to evaluate integrals. Applies Simpson's rule and other elementary numerical quadrature methods to approximate integrals. Applies the integral calculus to find arc lengths, areas of surfaces of revolution and to solve force and work problems. Applies the direction field technique to find graphical solutions of differential equations. Applies Euler's technique to approximate the solution of initial value problems. Studies techniques of solving separable differential equations. Studies techniques to determine convergence of sequences and series. Studies techniques to determine the power series representation of functions.

MATH 213 Multidimensional Mathematics**3 Credits**

Prerequisites: MATH 136 and MATH 137. Introduction to mathematics in more than two dimensions. Develops the ability to graph curves, surfaces, and functions in three dimensions. Explores different coordinate systems. Introduces students to two- and three-dimensional vector spaces and vector operations. Introduces students to the use of matrices to solve linear equation and familiarizes students with basic matrix operations.

MATH 218 Calculus with Analytic Geometry I**5 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or MATH 131 and MATH 132 or MATH 133 and MATH 134 or MATH 136 and MATH 137. Topics from analytic geometry, concept and properties of limits, concept of mathematical continuity definition and procedures for differentiation, and definition and procedures for anti-differentiation.

MATH 219 Calculus with Analytic Geometry II**5 Credits**

Prerequisites: MATH 218. Topics from Calculus and Analytic Geometry I, calculus to hyperbolic and inverse trigonometric functions, first and second order differential equations, integration by parts and partial fractions, convergence, Taylor and Maclaurin series expansions, and L'Hôpital's rule.

MATH 221 Calculus for Technology I**3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment, or MATH 131 I and MATH 132 or MATH 133 and MATH 134 or MATH 136 and MATH 137. First course in a two-semester sequence in the techniques of calculus, with an emphasis on how they are applied to technology. Topics include limits, continuity, first and second derivatives, definite and indefinite integrals, and applications of these concepts.

MATH 222 Calculus for Technology II**3 Credits**

Prerequisites: MATH 221. Second course in a two-semester sequence in the techniques of calculus, with an emphasis on how they are applied to technology. Topics include the calculus of transcendental functions, techniques of integration, differential equations, infinite series, and applications of these concepts.

MATH 235 Discrete Mathematics**4 Credits**

Prerequisites: MATH 135. Introduction to the suite of mathematical and logical tools used in information sciences including automata and computability theory, elementary probability and statistics, and basics of classical information theory.

MATH 261 Multivariate Calculus**4 Credits**

Prerequisites: MATH 212 or MATH 219. Solid analytic geometry, partial differentiation, multiple integrals.

MATH 264 Differential Equations**3 Credits**

Prerequisites: MATH 261. A first course in ordinary differential equations. The course will develop topics from a dynamical systems perspective and use technology to treat these topics graphically, numerically, and analytically. In addition to the skills of logical analysis and creative problem solving, this course will enhance the student's ability to analyze problems orally and in writing, in addition to mastering the mathematical skills used in this analysis.

MATH 265 Linear Algebra**3 Credits**

Prerequisites: MATH 212. An introduction to linear algebra. Systems of linear equations, matrix algebra, vector spaces, determinants, eigenvalues, eigenvectors, diagonalization of matrices, applications.

MATH 279 Math Research**1 Credit**

Prerequisites: Successful completion or concurrent enrollment in either MATH 212 or MATH 219. Gives students the opportunity to research a topic in mathematics that is specifically related to their career objectives or interests. Provides real life exposure to mathematics while earning credit toward an associate degree.

MEAS 107 Administrative I**3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Provides a basic understanding of the administrative duties and responsibilities pertinent to medical offices. Includes instruction in medical correspondence and records, case histories of patients, filing, telephone procedures, appointment scheduling, receptionist duties, and processing mail. Written, verbal and nonverbal communications according to patient needs are covered as well as documentation and associated legal and ethical boundaries.

MEAS 108 Administrative II

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Provides instruction in medical office financial administration, bookkeeping, materials management, daily financial transactions with patients and outside sources, banking procedures, billing and collection. General office policies are explained. Inventory management of administrative supplies and equipment is covered. Community resources available to patients are explored.

MEAS 109 The Professional Medical Assistant

3 Credits

Prerequisites: HLHS 101; Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095; Demonstrated competency through appropriate assessment or earning a "C" or better in MATH 080. Corequisite: HLHS 101. This course provides instruction in applied communication, medical business practices, and professional medical law and ethics in the ambulatory healthcare setting.

MEAS 110 Introduction to Clinical Practice

3 Credits

Prerequisites: APHY 101, HLHS 101; Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095; Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 080. Corequisites: APHY 101. This course provides an introduction to the clinical practices of medical assisting to include anatomy and physiology, basic principles of first aid, applied mathematics, nutrition, legal scope of practice, infection control, and safety and emergency practices in the ambulatory medical setting.

MEAS 137 Outpatient Insurance and Basic Coding

3 Credits

Prerequisites: HLHS 101 and APHY 101. Provides an overview of health insurance plans medical and the skills needed to complete and submit insurance claims for third party reimbursement. Procedural and diagnostic coding appropriate to the ambulatory healthcare setting is included.

MEAS 207 Integrated Medical Office Procedures

3 Credits

Prerequisites: MEAS 107 and MEAS 108. Provides instruction in medical office procedures using integrated computer programs that manage appointments, insurance documentation, file maintenance and creation, management of medical correspondence, licensing and software update processes and data back-up files.

MEAS 209 Electronic Administrative Practices

3 Credits

Prerequisites: MEAS 109, MEAS 137. Corequisites: MEAS 137. Provides instruction in administrative functions in the ambulatory healthcare setting to include appointment management and basic finance functions using practice management and electronic health records systems.

MEAS 215 Advanced Medical Terminology

3 Credits

Prerequisites: HLHS 101. A more detailed and advanced study of the derivatives of medical terms, symbols and signs. It presents an in-depth study of the correlation between medical vocabulary and the application of those terms in the anatomy and physiology of the body, related diseases, conditions and treatment.

MEAS 218 Pharmacology

3 Credits

Prerequisites: MEAS 110 and APHY 101, and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 080. Discusses the most common medications in current use with emphasis on classifications, uses, routes or administration, dosages, interactions, incompatibilities, and side effects. Emphasizes the current 50 most commonly prescribed drugs. Addresses special precautions, legal aspects, and patient education and preparation and administration of medications.

MEAS 219 Medical Assisting Laboratory Techniques

3 Credits

Prerequisites: HLHS 101, MEAS 110 and APHY 101 or MEAS Program Chair approval. This advanced course prepares students to understand and perform entry-level basic laboratory procedures. This includes fundamental principles of medical lab practice, disposal of biohazard materials, specimen collection, use of methods of quality control, urinalysis testing, chemistry testing, hematology testing, immunology testing, microbiology testing, and discussion of follow-up testing results.

MEAS 221 Seminar I

1 Credit

Prerequisites: None. Discusses topics of current interest in the medical assisting profession. Focuses on special interest project for students in the Medical Assisting Program. Uses field trips, guest speakers, audiovisual activities and seminars.

MEAS 227 Medical Office Management

3 Credits

Prerequisites: MEAS 107, MEAS 108 and MEAS 137. An in-depth study of various influences on office functions providing a background for organization and management of a physician's office. Includes government and professional sources for consultation.

MEAS 238 Clinical I

3 Credits

Prerequisites: MEAS 110, and MEAS Program Chair approval. Catalog Description: This course provides instruction in the clinical aspects of the ambulatory healthcare setting. Includes vital signs, asepsis, sterilization, and treatment room procedures.

MEAS 239 Clinical II **3 Credits**

Prerequisites: MEAS 218 and MEAS 238. Corequisite: MEAS 218. Catalog Description: This course provides a continuation of clinical skills and theory, which allows the student to become familiar with the following clinical duties: Medications, EKG's, pulmonary function testing and other technical skills required in the ambulatory healthcare setting.

MEAS 240 Advanced Clinical Procedures **3 Credits**

Prerequisites: MEAS 239. Advances the knowledge and skills enabling the student to assist in clinical management in the medical and surgical specialties. Addresses health services in the community which are directed toward prevention of disease and maintenance and restoration of health.

MEAS 242 Disease Conditions **3 Credits**

Prerequisites: APHY 102 and HLHS 101. Presents the basic concepts of diseases, their courses and functional disturbances as they relate to body systems. Includes the precipitating risk factors and appropriate methods of patient education regarding various disease processes.

MEAS 260 Medical Assisting Administrative/ Clinical Externship **5 Credits**

Prerequisites: MEAS 137, MEAS 209, MEAS 218, MEAS 219, MEAS 239, APHY 102, Professional CPR/AED Certification and MEAS Program Chair Approval. Catalog Description: Course provides opportunities to observe, perform, and discuss various administrative and clinical competencies under supervision, with learning experiences obtained in selected physician's offices, clinics or hospitals.

MEAS 272 Spanish for Healthcare Providers **3 Credits**

Prerequisite: None. Provides instruction in understanding and communicating, basic medical office procedures, basic medical procedures, insurance filing procedures, and basic procedures in regards to medical treatment, taking medications and the basic principles of mental health and applied psychology with patients whose primary language is Spanish.

MEAS 274 Nutrition and Disease **3 Credits**

Prerequisites: None. This course presents basic principles of nutrition and the role nutrients play in maintaining good health, as well as their role on certain clinical conditions. This course introduces the characteristics, functions, and food sources of the major nutrient groups. Students will be made aware of nutrient needs throughout the life cycle. Students will learn to modify diets to meet various nutritional needs and to plan menus using modified diet principles. Students completing this course will be equipped to perform nutritional patient education in his or her role as a Medical Assistant.

MEAS 299 CMA Comprehensive Review **3 Credits**

Prerequisites: MEAS Program Chair Approval. Designed to review the entire medical assisting program in preparation for the CMA national examination. Administrative, clinical and general information is covered. Testing procedures are addressed.

MEDL 101 Fundamentals of Laboratory Techniques **3 Credits**

Prerequisites: Program Chair Approval. This course introduces the elementary skills required in the medical laboratory. Subjects covered include: quality control, pipetting skills, venipuncture techniques, microscopic skills, infection control, laboratory math and laboratory safety.

MEDL 102 Routine Analysis Techniques **3 Credits**

Prerequisites: Program Chair Approval. This course deals with the principles, practices and clinical laboratory techniques associated with the routine analysis of urine.

MEDL 196 Introduction to Patient Care and Phlebotomy **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Introduces the student to the health care delivery system, instruction in specimen collection techniques, infection control and safety and applications of communication concepts and stress management.

MEDL 197 Clinical Phlebotomy Experience **3 Credits**

Prerequisites: MEDL 196. Covers the practice and demonstration of clinical applications of phlebotomy in the clinical setting.

MEDL 198 Clinical Phlebotomy Discussion **1 Credit**

Prerequisites: Student must be in good standing and currently enrolled in MEDL Program. Designed for students to develop the professional socialization process that is necessary for functioning in a health care setting as well as review routine and special phlebotomy procedure in light of phlebotomist-patient interaction.

MEDL 200 Hemostasis Theory and Practice **1 Credit**

Prerequisites: Program Chair Approval. Continues the study of principles and procedures in hemostasis. The course introduces procedures which lie outside those routinely performed and includes clinicopathologic correlations.

MEDL 201 Immunology Techniques **3 Credits**

Prerequisites: Program Chair Approval. This course is designed to provide the student with a basic understanding of the principles of the human immunologic system as well as an understanding of, and experience in, routine testing.

MEDL 202 Immunohematology Techniques **3 Credits**

Prerequisites: MEDL 201 and Program Advisor Approval. Provides instruction on the principles, practice, and procedures used for blood banking in the clinical laboratory.

MEDL 205 Hematology Techniques I **3 Credits**

Prerequisites: MEDL 101, MEDL 102 and Program Advisor Approval. This course presents theory of blood formation and function and routine hematologic procedures, with emphasis upon differentiation of normal and commonly encountered abnormal blood cells. Also presents clinic pathologic correlations.

MEDL 206 Hematology Techniques II **3 Credits**

Prerequisites: MEDL 205 and Program Advisor Approval. This course continues the study of principles and procedures in hematology. It introduces procedures which lie outside those routinely performed. Continues cell differentiation, with emphasis upon early and less commonly encountered abnormal cells, with associated special stains. Includes clinic pathologic correlations.

MEDL 207 Chemistry Techniques I **3 Credits**

Prerequisites: CHEM 101 and Program Advisor Approval. Presents principles, procedures and clinicopathologic correlations in routine chemical analysis of the blood and other body fluids. Provides laboratory experiences in basic methods, selected to develop routine analytical abilities and to promote the ability to recognize sources of error.

MEDL 209 Routine Analysis Applications **1 Credit**

Prerequisites: MEDL 102. Provides the student with study of the clinical applications of routine analysis in the hospital laboratory including physical, chemical, and microscopic examination of urine.

MEDL 210 Hematology Applications **3 Credits**

Prerequisites: MEDL 206 and Program Advisor Approval. Knowledge and skill development pertaining to the principles and techniques of hematology in the hospital laboratory.

MEDL 212 Immunology Applications **1 Credit**

Prerequisites: MEDL 201 and Program Advisor Approval. Studies and practices the clinical application of serology in the hospital laboratory.

MEDL 213 Immunohematology Applications **3 Credits**

Prerequisites: MEDL 202 and Program Chair Approval. Applications of principles and procedures used in blood banking in the hospital laboratory are taught in the clinical laboratory setting.

MEDL 215 Parasitology and Mycology **1 Credit**

Prerequisites: MEDL 222. Examines the isolation, identification, life cycles and disease processes of pathogenic and opportunistic fungi and parasites.

MEDL 218 Clinical Pathology **3 Credits**

Prerequisites: Program Advisor Approval. The course is a review course in preparation for the National Registry Examination and will include current testing procedures, disease conditions, diagnosis, etiologies, clinical symptoms and related laboratory findings.

MEDL 221 Clinical Microbiology Applications **3 Credits**

Prerequisites: MEDL 222 and Program Chair Approval. Provides the student with the study of applications and clinical practices of microbiology found in a clinical laboratory.

MEDL 222 Microbiology Techniques **3 Credits**

Prerequisites: MEDL 101, MEDL 102 and Program Chair Approval. This course will instruct the student in the principles of bacteriology including: gram-negative and gram-positive bacilli and cocci, fastidious organisms and an overview of anaerobic organisms and acid-fast bacteria. Instruction in basic laboratory techniques in clinical bacteriology will also be included.

MEDL 224 Chemistry Applications **3 Credits**

Prerequisites: MEDL 207 and MEDL 227 and Program Chair Approval. Corequisites: MEDL 227. Study and practice of the analytical aspects of clinical chemistry in the hospital laboratory.

MEDL 227 Chemistry Techniques II **2 Credits**

Prerequisites: MEDL 207 and Program Chair Approval. Continues the study of principles, procedures and clinicopathologic correlations in the chemical analysis of blood and other body fluids. Introduces procedures which lie outside those routinely performed in the clinical chemistry laboratory, including clinicopathologic correlations.

MEDL 271 Clinical Laboratory Science Review

3 Credits

Prerequisites: Program Advisor Approval. Clinical Laboratory Science Review has been developed as a tool to facilitate both self-assessment and new learning. It is designed to provide a challenging personal assessment of practical and theoretical knowledge in all program courses needed by medical laboratory technicians. Provides means to identify strengths, weaknesses, and gaps in knowledge base, and a way to provide guidance in test-taking skills.

MEDL 280 Co-op/Internship

1-5 Credits

Prerequisite: Program Advisor Approval. Provides clinical laboratory experience in an affiliated laboratory. Gives students the opportunity to practice and employ fundamental lab skills and learn advanced techniques in a supervised setting. Provides on-the-job experience while earning credit toward the associate degree. Also provides a mechanism for a skills refresher course for credentialed individuals who have been out of the field for a period of time.

MEMS 101, Introduction to Microsystems

3 Credits

Prerequisites: None. This course will introduce Microelectromechanical Systems construction and their use in systems today. Experiments will be used throughout this course that introduces the methods used to construct MEMS devices with the various process steps. Theories and practices associated with the construction and use of sensor, actuators and transducers will be discussed. Process steps in the creation of MEMS devices will be discussed as well as the use of cleanrooms and cleanroom equipment and processes.

MEMS 102, Microsystems Characterization

3 Credits

Prerequisites: None. MEMS 102 will introduce the subject of characterizations of MEMS devices. This course will use off the shelf electronic devices and sensors. The focus will be on device characterization and the use of lab equipment and LabView. Device modeling will be explored to see how simulation models are developed and used to predict circuit performance. Some statistics will also be introduced to describe how parts vary. This variability will be added to the device models.

MEMS 103, Microsystems and Electronics

3 Credits

Prerequisites: None. This course will introduce the use of MEMS devices as sensors and actuators and how they would interface with electronics, strain gauges, pressure sensors, accelerometers, gyroscopes, capacitive and piezo resistive sensing will be addressed. Electrical and mechanical properties will be evaluated to see how mechanical properties can be translated to electrical inputs and outputs. Electronics utilized to measure sensors and excite transducers will be used to interface with electronics and tested.

METC 105 Introduction to Engineering Technology

3 Credits

Prerequisites: None. Provides the beginning engineering technology student with the basic tools necessary for success in their chosen field. Topics include: survey of engineering technology careers, problem solving, introduction to engineering mathematical and statistical concepts, technical laboratories, data presentation and report writing, use of scientific calculators, engineering calculations, metrology, use of spreadsheets for data analysis and presentation, and engineering ethics and responsibilities.

METC 111 Statics

3 Credits

Prerequisites: MATH 137. Studies applied mechanics dealing with bodies at rest without the use of calculus. Covers units, vectors, forces, equilibrium, moments and couples, planar force systems, distributed forces, analysis of structures, and friction.

METC 143 Materials and Processes

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095, and MATH 100. Introduces students to structures, properties, processing, and applications of metals and ceramics commonly used in industry and develop problem solving skills in the areas of material selection, evaluation, measurement and testing.

METC 220 CAD for Mechanical Design

3 Credits

Prerequisites: METC 107. An introduction and exploration of solid modeling using parametric solid modeling software. Emphasis is placed on learning the basic concepts of creating parts using software-specific modeling and modification commands. The concepts of parent-child relationships as well as parametric relations are introduced. Assemblies of components are created based upon student-created parts, and the generation of engineering drawings will be required.

METC 230 Fluid Power

3 Credits

Prerequisites: MATH 137. This course consists of the study of compressible and incompressible fluid statics and dynamics as applied to hydraulic and pneumatic pumps, motors, transmissions, and controls.

METC 237 Systems Measurement, Automation, & Control

4 Credits

Prerequisites: EECT 111. This course examines the concepts, devices, and common practices associated with modern automation systems. Common industrial control components and integrated technology are studied, and industrial safety practices and procedures are emphasized throughout the course. Students learn how to wire, program, and troubleshooting microcontroller based automation systems with a focus on interfacing and controlling a variety of electromechanical devices.

METC 279 Portfolio and Professional Preparation

1 Credit

Prerequisites: Program Advisor/Chair Approval (75% Credit Completion). The two primary course goals are the creation of a final portfolio for graduation, and the successful completion of an assessment of student skills related to the METC program. This will require the collection and organization of all pertinent coursework in a portfolio as well as the generation of detailed supporting information. Every student must submit upon graduation a copy of the final portfolio for review and departmental archives, and every student must take a comprehensive exam covering pertinent areas of their engineering technology education.

MKTG 101 Principles of Marketing

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095 and MATH 023 or MATH 080 or higher. COREQUISITES: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or MATH 080 or higher. Introduces environmental analysis, marketing research, consumer behavior, segmenting, targeting, positioning, branding, product management, price strategy, supply chain management, integrated marketing communications, and market analytics and control. Develop a basic marketing plan.

MKTG 102 Principles of Selling

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Provides an overview of the selling process. Includes the psychology of selling and develops skills through a series of selling situations.

MKTG 201 Introduction to Market Research

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093, or ENGL 095. Provides an overview of the selling process. Includes the psychology of selling and develops skills through a series of selling situations.

MKTG 210 Promotion Management

3 Credits

Prerequisites: MKTG 101. Presents management planning and oversight techniques for effectively communicating the results of the marketing strategy to customers. Provides a comprehensive overview of promotion methods as they interact in the marketing mix, which includes price, channel of distribution, and product. Familiarizes the student with a global perspective of promotion management.

MKTG 213 Marketing in Non-Profit Organizations

3 Credits

Prerequisites: MKTG 101 or Advisor approval. Introduces the use of marketing management to persons working in the non-profit environment, with emphasis on the marketing mix and the marketing concept and their specific application to the non-profit sector. This class is also designed for marketing majors to understand the growing world of non-profit marketing.

MKTG 220 Principles of Retailing

3 Credits

Prerequisites: MKTG 101. Studies retailing concepts and practices, including retail merchandise planning, buying, pricing, promotion, and control in established retail operations. Attention is given to managerial and operational skills.

MKTG 230 Consumer Behavior

3 Credits

Prerequisites: MKTG 101. Study of the basic principles of consumer behavior which offers insight into the buyer-seller relationship. Application of theories from psychology, social psychology and economics are examined. Course examines concepts that have implications for marketing management decisions.

MKTG 252 Introduction to Digital Marketing

3 Credits

Prerequisites: None. Provides an introduction to the world of digital marketing media and digital medial tools. Integrates digital media into organizational and marketing strategy. Explores the most popular digital marketing tactics and tools. Emphasizes familiarity with executing digital media, understanding the marketing objectives that digital media can help organizations achieve, and establishing and enhancing an organization's digital marketing presence.

MKTG 257 Digital Marketing Management

3 Credits

Prerequisites: MKTG 252. Provides an introduction to the management functions involved in digital marketing, including digital market's effect on the traditional 4 P's of marketing, developing an integrated digital marketing strategy, and effectively transforming a traditional, non-digitally integrated organization into a digitally integrated organization. Profiles digital audiences and market segments and reviews using the Internet as a primary and a secondary marketing research tool as well as using cloud-based customer relationship-marketing (CRM) applications.

MORT 100 Orientation to Funeral Service

3 Credits

Prerequisites: ENGL 111 and Program Chair Approval. An introduction to funeral service, ancient history, historical development, present funeral practices, values of funeral service, personal qualifications, ethics.

MORT 101 Grief Psychology for Funeral Service

3 Credits

Prerequisites: MORT 100. An examination of theory and management of grief, the process of mourning, and the value of the funeral service in bereavement. Grief reactions according to age and special types of loss will be examined. In addition, the course will cover the funeral director's professional responsibilities to the families he or she serves.

MORT 102 Mortuary Law

2 Credits

Prerequisites: BUSN 201. Principles of mortuary law; duties, rights and liabilities for final disposition. Business law; public and personal liability; business organization; licensing and zoning regulations. Probate proceedings, social security, and life insurance benefits, and ethical standards relating to funeral service.

MORT 105 Embalming Theory I

3 Credits

Prerequisites: MORT 100 and Program Chair Approval. An introduction of basic vocabulary utilized by the professional embalmer. The purposes of embalming, as well as responsibilities, conduct and qualities of the professional embalmer are discussed. An inventory of typical preparation room instruments and supplies is examined. Basic embalming case analysis is investigated as well as basic concepts of embalming chemistry. Techniques for embalming non-complicated cases are also investigated.

MORT 106 Anatomy for Funeral Service

2 Credits

Prerequisites: MORT 100 and Program Chair Approval. The study of the human body with particular emphasis on those systems providing the foundation for embalming, pathology, public health and restorative arts.

MORT 107 Funeral Service Merchandising

2 Credits

Prerequisites: MORT 102. Corequisites: MORT 102. Funeral Merchandising is designed to introduce the funeral service student to the basics of merchandising as they apply to the funeral profession. Funeral providers as defined by the FTC in 1984 offer both service and merchandise. This outline considers both service and merchandise as the products provided by funeral service practitioners.

MORT 205 Embalming Theory II

2 Credits

Prerequisite: MORT 105. This course is a continuation of MORT 105 Embalming Theory I. This course investigates advanced embalming case analysis. Strategies and techniques for embalming complicated and/ or complex cases are discussed. Techniques for preparing a deceased human body for transportation and/ or long term storage are presented. Embalming theories/ techniques for handling specialized diseases, body conditions and other complications are discussed.

MORT 207 Funeral Service Practicum I

3 Credits

PREREQUISITES: MORT 105 and MORT 106. One laboratory session per week for one semester in an appropriate mortuary setting. Practical experience in all phases of funeral service including embalming, funeral directing, and funeral home operation. Students are placed in local funeral homes to work under the direct supervision of qualified licensed preceptor to gain knowledge of procedures used in embalming human remains for funeral services.

MORT 209 Restorative Art

3 Credits

Prerequisites: MORT 105 and MORT 106. Corequisites: MORT 205. The study of facial anatomy, color relationships, and restorations. Development of skills in anatomical modeling and cosmetics.

MORT 210 Microbiology and Pathology for Funeral Service

3 Credits

Prerequisites: MORT 106 and MORT 205. The study of Microbial and Pathological disease conditions and how they affect various parts of the body, with particular emphasis on those conditions which relate to or affect the embalming or restorative art process.

MORT 211 Funeral Directing

3 Credits

Prerequisites: MORT 105. The student will be taught specific counseling procedures used when counseling the bereaved family. Specific attention will be paid to the counseling and communication techniques and skills that will assist individual family members with handling grief and the mourning process. In addition, students will explore: notification of death, transfer of remains, prefunded/preplanned funerals, religious practices, fraternal and military funerals, shipment of remains, cremation, aftercare and professionalism in funeral service.

MORT 212 Funeral Service Management

2 Credits

Prerequisites: MORT 102. Corequisites: MORT 102. The curriculum guideline for Funeral Service Management is designed to introduce the student to the basic principles of management. The curriculum is divided into two main sections. The first covers general management technique and theory. The second section examines specific areas of funeral service and management guidelines for those areas.

MORT 217 Funeral Service Practicum II

3 Credits

Prerequisites: MORT 207. A continuation of the MORT 207 Funeral Service Practicum I course. Develops practical funeral directing and embalming skills, combining work experience in the funeral home. Student will be assigned to an affiliated funeral home serving under the direct supervision of a licensed preceptor.

MORT 220 National Board Exam Review

3 Credits

Prerequisites: Program Chair Approval. This course is designed for the student to prepare for and complete the National Board Examination. This examination is a graduation requirement and students must successfully complete the examination in order to become licensed funeral directors/ embalmers in most states. MORT 220 reviews the major learning objectives of the core MORT curriculum as they relate to the National Board Examination. The course also examines various testing methodologies and test taking strategies. Upon successful completion students will meet the requirements for the program to be released for the National Board Exam which is a state requirement for licensure.

MORT 281 & 288 Special Topics

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in the field of mortuary science. Identifies and offers various special topics during each term under this course number.

MPRO 100 Introduction to Plant Floor and CNC Principles

3 Credits

Prerequisites: None. Introduces the basic concepts of manufacturing operations and plant floor layout in the production environment. Applications of Computer Numerical Control for milling, lathe and turning operations are developed as a foundation for machining operations. Coordinate system concepts are introduced relevant to the machining processes.

MPRO 101 Shop Mathematics

3 Credits

Prerequisites: None. A review of basic operations of numbers, fractions and decimals. Covers the practical mathematics that every machinist is expected to use in the shop and in the creation and maintenance of tools, fixtures and industrial devices. Applies math to special calculations such as: taper angles, gearing ratios, gearing systems, and cutting speeds and feeds.

MPRO 102 Introduction to Print Reading

3 Credits

Prerequisites: None. Provides an introduction to reading and interpreting machine shop symbols, machining blueprints and working drawings used in trades and crafts. Focuses on dimension, shape, fabrication and assembly. Applies basic mathematics to the solution of print interpretation.

MPRO 103 Manufacturing Automation

3 Credits

Prerequisites: None. Introduces the basic concepts of robotics and types factory automation used in manufacturing. This course will provide knowledge in the areas of robot safety, robot types, and robotic applications. The common types of factory automation will be identified.

MPRO 106 Introduction to the Workplace and Safety

3 Credits

Prerequisites: None. Introduces basic safety instruction including OSHA requirements and other concerns (MSDS, confined space, lock out/tag out, zero energy state, hazardous materials, storage of flammable materials, portable powered tool safety, hand tool safety, record keeping, training, employer enforcement of safety regulations, right to know, etc.).

MPRO 107 CNC Operations

3 Credits

Prerequisites: None. Introduces the basic concepts of Computer Numerical Control (CNC) operations as they exist in a manufacturing environment. Skills in setup and operation of a CNC mill and lathe will be acquired using multiple machine tool controllers.

MPRO 108 Metrology

3 Credits

Prerequisites: None. Introduction to precision measurement techniques and applications. Provides instruction in surface plate inspections, gauging techniques and instruments, optical comparators, hardness testing, and Coordinate Measuring Machines (CMM). Presents calibration and measurement system analysis.

MPRO 109 Quality Control Concepts and Techniques

3 Credits

Prerequisites: None. Covers current quality control concepts and techniques in industry with emphasis on modern manufacturing requirements. Studies the fundamental tools of Statistical Process Control which are used in industry to reduce costs and increase productivity at a predictable quality level. Emphasizes principles and techniques of SPC to ensure prevention instead of detection of problems. Includes basic statistical and probability theory, sampling techniques, process control charts, the nature of variation, histograms, attributes and variable charts.

MPRO 112 Mechatronics Mechanical Systems

3 Credits

Prerequisites: None. Introduces the basic principles and practices of mechanical technology used in manufacturing and mechatronic systems. This course will examine the appropriate procedures for the installation, troubleshooting, and repair of mechanical machine components. Concepts covering; blueprints, material properties, lubrication, mechanisms, mechanical drives, and preventive maintenance of mechatronic systems will be discussed.

MPRO 122 Mechatronics Electrical Systems

3 Credits

Prerequisites: None. Introduces the fundamentals of electricity and control systems used in manufacturing and mechatronic systems. Concepts covered will include; electrical safety, AC/DC circuits, electrical measurements, circuit analysis, transformers, relay controls, timer applications, electrical terminology, types of sensors, interpretation of electrical symbols, and ladder diagrams.

MPRO 201 Lean Manufacturing

3 Credits

Prerequisites: None. Introduces the philosophical background, historical development, fundamental concepts, operating fundamentals, and the organizational rationale for the implementation of lean disciplines in manufacturing. The use and implementation of lean disciplines has generally resulted in the ability of an enterprise to develop a work environment that promotes continuous improvement, eliminates waste, reduces operating cost, improves quality, and achieves measurable improvement in customer satisfaction.

MPRO 202 Mechatronics Control Systems I

3 Credits

Prerequisites: MPRO 122. Introduces the common types of control systems including Programmable Logic Controllers (PLCs) and electric motor drive systems used in manufacturing and mechatronic systems. Concepts covered will include PLC advantages, PLC programming, sequencing, control circuit wiring, power circuit wiring, motor controls, relay controls, timer controls, switches, ladder diagrams, testing equipment, component and controls troubleshooting.

MPRO 203 Production Technology

3 Credits

Prerequisites: None. Introduces the different types of work-holding devices, their uses, advantages and disadvantages in CNC milling and lathe machines. The devices will be expanded to include manual and hydraulic work-holding devices. Topics will also include the different types of cutting fluids, coolants and oils used in advanced machining production equipment.

MPRO 205 Manufacturing Metals

3 Credits

Prerequisites: None. Introduces the basic concepts of metals including composition, properties, and usage in Manufacturing. Both ferrous and non-ferrous materials will be examined in the course. The course will also provide an overview of the principles and practices of heat treatment of metals.

MPRO 206 Mechatronics Control Systems II

3 Credits

Prerequisites: MPRO 202. Course continues to build on theory, operation and PLC programming of automated mechatronics machinery at an advanced level. Concepts covered include event sequencing, machine modes of operation, proper program development, advanced program control instructions, advanced data manipulation instructions, human machine interface (HMI) usage and programming, PLC networking, variable frequency drives, speed and torque control, and fault diagnostics and troubleshooting.

MPRO 207 Production Machine Tooling

3 Credits

Prerequisites: None. Introduces the basic concepts of production machine tooling setup and adjustments. Tooling used in both milling and turning is introduced. ANSI standards for insert and machine tooling are defined.

MPRO 227 Geometric Dimensioning and Tolerancing

3 Credits

Prerequisites: MPRO 102. Introduces the fundamental principles of geometric dimensioning and tolerancing according to the latest ANSI standards. Students will apply geometric dimensioning and tolerancing symbols along with tolerances of form, profile, orientation, run-out, and location to mechanical problems.

MPRO 250 Advanced Lean Manufacturing

3 Credits

Prerequisites: MPRO 201. Continues the philosophical background, historical development, fundamental concepts, operating fundamentals, and the organizational rationale for the implementation of lean disciplines in manufacturing. Practical application of Lean theory by the Toyota Production System will be demonstrated and explained. Further develops the use and implementation of lean disciplines that results in the ability of an enterprise to develop a work environment that promotes continuous improvement, eliminates waste, reduces operating cost, improves quality, and achieves measurable improvement in customer satisfaction.

MPRO 279 Manufacturing Production & Operations Capstone

2 Credits

Prerequisites: MPRO 203 or Program Chair approval. This course provides students with the opportunity to develop strong professional presence skills such as communication, networking, and ethical problem solving.

MRIT 111 Orientation and Patient Safety

3 Credits

PREREQUISITES: Certification and Registration with the ARRT in Radiography, Nuclear Medicine (registration through NMTCB is also accepted), Radiation Therapy, or Sonography (registration through ARDMS is also accepted). CATALOG DESCRIPTION: Content provides a fundamental background in ethics. The historical and philosophical basis of ethics and the elements of ethical behavior are discussed. The student examines a variety of ethical issues and dilemmas found in clinical practice. Content also provides an overview of the foundations in radiologic science and the practitioner's role in the health care delivery system. The principles, practices and policies of health care organizations are examined and discussed in addition to the professional responsibilities of the MR technologist. Lastly, the content in this section provides information on the principles of MR safety and concepts that relate to the safety of MR equipment. Because the MR environment poses unique risks to patients and personnel, screening questionnaires (both verbal and written) must be completed by all individuals entering the MR suite. Education of patients and personnel is essential to preventing MR incidents. This section also discusses handling patient and magnet-related emergencies within the MR environment, the reporting of incidents to an MR Safety Officer, and safe administration of contrast media.

MRIT 112 MRI Imaging Procedures I

3 Credits

PREREQUISITES: CATX 102 Cross Sectional Anatomy I, MRIT 111 Orientation and Patient Safety, and MRIT 117 Physical Principles, Instrumentation, and Informatics. CATALOG DESCRIPTION: This content provides the student with imaging techniques related to the central nervous system (CNS), neck, thorax, musculoskeletal system and abdominopelvic regions. The content covers specific clinical application, available coils and their use, considerations in the scan sequences, specific choices in the protocols (e.g., slice thickness, phase direction and flow compensation) and positioning criteria. Anatomical structures and the plane that best demonstrates anatomy are discussed as well as signal characteristics of normal and abnormal structures. Content provides the student with knowledge of the parameters and imaging options used to create MR images. In addition, the content introduces quality assurance measures used in maintaining image quality. Content is designed to provide the student with a comprehensive overview of MR pulse sequences, image formation and image contrast. Pulse sequences include spin echo, fast spin echo, gradient echo, inversion recovery, echo planar, parallel imaging and spectroscopy. In addition, tissue characteristics, contrast agents and post-processing techniques are covered.

MRIT 113 Mr. Clinical Practice and Patient Management I

3 Credits

PREREQUISITES: Certification and Registration with the ARRT in Radiography, Nuclear Medicine (registration through NMTCB is also accepted), Radiation Therapy, or Sonography (registration through ARDMS is also accepted). CATALOG DESCRIPTION: Content is presented as a progression in competency levels through clinical performance objectives and competency exams. Students can access the educational materials, examination facilities and personnel necessary to competently achieve content objectives. Objectives include demonstration and observation of an activity, after which the student assists in performing the activity. When a satisfactory degree of proficiency is apparent, the student can perform the activity under direct supervision. When both the student and instructor are satisfied with the student's proficiency, the student performs MR imaging procedures under indirect supervision to gain experience and expertise.

MRIT 117 Physical Principles, Instrumentation and Informatics

3 Credits

PREREQUISITES: Certification and Registration with the ARRT in Radiography, Nuclear Medicine (registration through NMTCB is also accepted), Radiation Therapy, or Sonography (registration through ARDMS is also accepted). CATALOG DESCRIPTION: Content provides the student with a comprehensive overview of MR imaging principles. The subjects are formatted in individual outlines and can be sequenced according to the level of knowledge desired. Topics include history of MR, nuclear MR (NMR) signal production, tissue characteristics, pulse sequencing, imaging parameters/options and image formation. Content introduces knowledge in computing and information processing. It presents computer applications in the radiologic sciences related to image capture, display, storage and distribution. Additional content is designed to provide the basic concepts of patient information and management. Medical records management, including privacy and regulatory issues, are examined. The role of the technologist is identified and discussed. In addition, this content imparts an understanding of the components, principles and operation of digital imaging systems found in MR, image data management, storage and data manipulation (post-processing). Factors that impact image acquisition, display, archiving and retrieval are discussed. Content also provides a comprehensive overview of the instrumentation associated with MR imaging. The subjects are formatted in individual outlines and can be sequenced according to level of knowledge desired. Topics include: magnetism, MR system components, MR magnets (e.g., permanent, resistive, superconducting, hybrid), radiofrequency (RF) systems, gradient systems, shim systems and system shielding.

MRIT 203 Mr. Clinical Practice and Patient Management I

3 Credits

PREREQUISITES: Certification and Registration with the ARRT in Radiography, Nuclear Medicine (registration through NMTCB is also accepted), Radiation Therapy, or Sonography (registration through ARDMS is also accepted). CATALOG DESCRIPTION: Content is presented as a progression in competency levels through clinical performance objectives and competency exams. Students can access the educational materials, examination facilities and personnel necessary to competently achieve content objectives. Objectives include demonstration and observation of an activity, after which the student assists in performing the activity. When a satisfactory degree of proficiency is apparent, the student can perform the activity under direct supervision. When both the student and instructor are satisfied with the student's proficiency, the student performs MR imaging procedures under indirect supervision to gain experience and expertise.

MRIT 218 MRI Imaging Procedures II

3 Credits

PREREQUISITES: CATX 102 Cross Sectional Anatomy, MRIT 111 Orientation and Patient Safety, and MRIT 117 Physical Principles, Instrumentation, and Informatics. CATALOG DESCRIPTION: This content provides the student with imaging techniques related to the central nervous system (CNS), neck, thorax, musculoskeletal system and abdominopelvic regions. The content covers specific clinical application, available coils and their use, considerations in the scan sequences, specific choices in the protocols (e.g., slice thickness, phase direction and flow compensation) and positioning criteria. Anatomical structures and the plane that best demonstrates anatomy are discussed as well as signal characteristics of normal and abnormal structures. Content familiarizes the student with the common pathologies found in magnetic resonance imaging and the appearance of these pathologies in various imaging protocols. Content covers a broad spectrum of commonly-imaged body systems and areas. Content provides basic concepts of pharmacology. This section covers the theory and practice of basic techniques of venipuncture and administration of diagnostic contrast agents and/or intravenous medications. The appropriate delivery of patient care during these procedures is emphasized.

MRIT 299 General Exam Review

3 Credits

PREREQUISITES: Program Director Approval. CATALOG DESCRIPTION: Reviews content of program, emphasizing anatomy, physics, imaging principles, positioning, and MRI safety. Simulated registry exams prepare the student for the American Registry of MRI Technologist Examination.

MRTC 107 Motorcycle Engine Principles and Design

3 Credits

Prerequisites: None. Introduces engine dynamics, theory of engine operation and characteristics of engine design. Studies R & R, visual inspection, precision measuring, gaskets, lubricants, sealants, coolants of modern engines, and engine service.

MRTC 127 Motorcycle Engine Service and Repair

3 Credits

Prerequisites: MRTC 107. Studies precision tools, equipment, and procedures needed to repair today's modern engine. Repair, proper assemble, and installation techniques applicable to the modern engine are included.

MRTC 173 Motorcycle Transmission/Drive Service and Repair

3 Credits

Prerequisites: MRTC 127. Studies theory and operation, diagnosis, testing and repair of motorcycle transmissions and drivelines.

MRTC 174 Motorcycle Frame and Electrical System

3 Credits

Prerequisites: None. Introduces the fundamentals and principles of motorcycle electronics and diagnosis. Extensive use of digital multimeters and circuit troubleshooting is covered. Emphasis is placed on reading and understanding wiring diagrams and symbols. Diagnosing, starting, and charging systems are also covered.

MRTC 209 Fuel and Ignition Systems

3 Credits

Prerequisites: None. This course covers the basic theory and operation of ignition, fuel, emission, and engine systems of motorcycles. Carburetion, fuel injection and computer control basics will be covered. Basic service and replacement procedures and techniques will also be covered.

MRTC 270 Motorcycle High Performance

3 Credits

Prerequisites: None. Covers the fundamentals, construction, components and design of high performance motorcycles for various racing venues. The course will also cover related systems; cooling, lubrication, suspension and braking. Students will study the theory, design and requirements of high performance engines/systems. Emphasis in this course is placed on bolt on performance modifications.

MTTC 101 Introduction to Machining

3 Credits

Prerequisites: None. Instructs the student in shop safety, industrial terminology, tools and machine tooling, measurement and layout. Includes laboratory exercises to begin project completion of turning, milling, and grinding applications. This course incorporates mandatory certification assessment for the National Institute of Metalworking Skills Measurement, Materials and Safety Job Planning, Benchwork, and Layout Certification.

MTTC 102 Turning Processes I

3 Credits

Prerequisite or Corequisite: MTTC 101. Instructs students in shop safety, industrial terminology, and provide laboratory experience toward project completion on the conventional lathe.

MTTC 103 Milling Processes I

3 Credits

Prerequisite or Corequisite: MTTC 101. Instructs students in shop safety and industrial terminology and provides laboratory experience toward project completion on the vertical and/or horizontal milling machine. This course incorporates mandatory certification assessment for the National Institute of Metalworking Skills Manual Milling Certification.

MTTC 104 Machinery Handbook

3 Credits

Prerequisites: None. Explores the intent and use of Machinery's Handbook. This course applies principles and concepts found in Machinery's Handbook to projects from industry.

MTTC 105 Abrasive Processes I

3 Credits

Prerequisites: MTTC 101. Corequisites: MTTC 101. Provides shop safety, industrial terminology, and laboratory experiences on abrasive processing machines. Includes super abrasives technology processes.

MTTC 106 Print Interpretation

3 Credits

Prerequisites: None. Applies mathematics in solving engineering and design related problems in the areas of die design, fabrication, assembly, special machinery, die casting and molds. Emphasizes GDT tolerancing.

MTTC 107 CNC Setup and Operations I

3 Credits

Prerequisite or Corequisite: MTTC 101. Introduces and instructs the student in all aspects of Computer Numeric Control (CNC) machine operation and setup. The student will set up and operate CNC mills and lathes utilizing set-up, production, in-process inspection, and preventive maintenance methods similar to what the student may experience in the present day work environment. This course prepares students to take the NIMS Level I CNC operations certification.

MTTC 110 Turning and Milling Processes **3 Credits**

Prerequisites: None. Provides shop safety, industrial terminology and laboratory experiences on conventional lathe and milling machines.

MTTC 185 Multi-Axis CNC Setup & Operation I **3 Credits**

Prerequisites: MTTC 107. Introduces CNC machining utilizing machines with more than 3 axis capability. These machines include Swiss Lathe, Turret Mill/Turn Lathe, 5 Axis Mill, and 5 Axis Wire EDM. This course teaches students to operate and setup these types of machines.

MTTC 195 Multi-Axis CNC Setup & Operation II **3 Credits**

Prerequisites/Corequisites: MTTC 185. Builds into more advanced setup and operation topics for CNC machining utilizing machines with more than 3 axis capabilities. These machines include Swiss Lather, Turret Mill/Turn Lathe, 5 Axis Mill, and 5 Axis Wire EDM. This course teaches students to operate and setup these types of machines.

MTTC 200 CNC Production Processes **3 Credits**

Prerequisite: MTTC 195. This course challenges the students to apply all of their skill in a modern production atmosphere. Students will be responsible to setup, operate, and monitor several production runs of product during the course. They will be assessed on quality, productivity, cost control, application of lean principles in the workplace, and documentation consistent with quality standards and process routing requirements. This course will utilize all types of CNC machines available.

MTTC 202 Advanced Turning Processes II **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071, and MTTC 102 or MTTC 110. Advanced training in shop safety and industrial terminology utilizing the conventional engine lathe. This course incorporates mandatory certification assessment for the National Institute of Metalworking Skills Manual Turning with Chucking Certification or the National Institute of Metalworking Skills Manual Turning Between Centers Certification.

MTTC 203 Milling Processes II **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 103; or FOUN 071 and MTTC 110. Covers shop safety, industrial terminology, and provide advanced laboratory experience towards project completion on the vertical and/or horizontal milling machine.

MTTC 205 Abrasive Processes II **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 105. Continuing emphasis on shop safety, industrial terminology, and advanced laboratory experience towards project completion on a variety of abrasive processing machines.

MTTC 206 Tooling Design I **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 110, MTTC 105, or FOUN 071 and MTTC 102 and MTTC 103 and MTTC 105. Introduces concepts of tooling design, assembly, and standards of fabrication. Emphasizes jig and fixture design/components, application and operational characteristics.

MTTC 207 Tooling Design II **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 102 and MTTC 103 and MTTC 105; or FOUN 071 and MTTC 110 and MTTC 105. Covers concepts of complex tooling design. Emphasizes forming, blanking, piercing and progressive type die design. Includes die applications, components, manufacture and assembly techniques.

MTTC 208 CNC Mill Programming **3 Credits**

Prerequisite: None. Introduces three axis CNC milling machine programming. Develops the theory of programming in the classroom with applications of the program accomplished on industry-type machines. Studies terminology of coordinates, cutter paths, angle cutting, and linear and circular interpolation.

MTTC 209 CNC Lathe Programming **3 Credits**

Prerequisites: Program Advisor Approval. Introduces two axis CNC lathe programming. Develops the theory of programming in the classroom with applications of the program accomplished on industry-type machines. Studies terminology of coordinates, cutter paths, angle cutting, and linear and circular interpolation.

MTTC 210 Interactive CNC **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 208; or FOUN 071 and MTTC 209. Introduces advanced applications of computer assisted part programming and simulation, language codes setup and operation, troubleshooting, and problem solving in a CNC turning center and CNC machining center. Includes related mathematical skills.

MTTC 211 Advanced Programming Techniques

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 208; or FOUN 071 and MTTC 209. Includes the application of advanced CNC programming techniques to industrial machining. Using down loading and up loading techniques utilized through advanced projects.

MTTC 217 Introduction to the Swiss Lathe

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 209. Introduces multiple axis CNC machining on the Swiss style lathe. This course allows students to explore concepts surrounding operation, setup, programming, and quality as applied to the Swiss style of CNC machine.

MTTC 220 CAD/CAM I

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 208; or FOUN 071 and MTTC 209. Covers the development of various machine routines. Introduces computer-assisted machining as it relates to automated milling and machining centers. Emphasizes proper programming techniques, control familiarity, file data and machining functions.

MTTC 221 CAD/CAM II

3 Credits

Prerequisites: MTTC 220. Covers the development of 3-D shapes and the codes necessary to produce parts. Requires student to design a new product or modify an existing design. Includes creating surface curves. Focuses on creating tool paths for complex 3-D surfaces.

MTTC 225 Introduction to Mold Making

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 102 and MTTC 103 and MTTC 105; or FOUN 071 and MTTC 110 and MTTC 105. Introduces the student to the basic fundamentals of mold design construction. The processes and basic construction of plastic molds, molds for die-castings and rubber molds are discussed. Each student in the class will design, build and inject their mold(s).

MTTC 227 Geometric Dimensioning and Tolerancing

3 Credits

Prerequisites: MTTC 106 or Advisor Approval. Introduces the fundamental principles of geometric dimensioning and tolerancing according historical current ASME Y14.5 standards. Students will interpret, measure, and apply all geometric dimensioning and tolerancing symbols and principles to industry standard technical drawings. Students will develop the ability to relate drawing requirements to actual part function and inspect parts using Geometric Dimensioning and Tolerancing standards.

MTTC 235 5 Axis CNC Milling

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 208. Expands on MTTC 208 CNC Mill Programming, providing further study in computer-aided numerical control programming. Focuses on canned cycles, loops, thread cycles, drilling, and pocket milling cycles. Introduces Conversational Programming software and 5 axis machine set-up.

MTTC 237 Multi-Axis CNC I

3 Credits

Prerequisites: FOUN 071. Corequisites: MTTC 220. Introduces multiple axes CNC machining on the Swiss Lathe, Mill/Turn Lathe, Multi-axis lathe, 5 Axis Mill, Multi-axis Wire EDM. This course allows students to explore concepts surrounding operation, setup, programming, and quality as applied to a wide range of Multi-axis CNC machines.

MTTC 238 Multi-Axis CNC II

3 Credits

Prerequisites/Corequisites: MTTC 237. Introduces advanced techniques in multiple axes CNC machining on the Swiss Lathe, Mill/Turn Lather, Multi-axis lathe, 5 Axis Mill, Multi-axis Wire EDM. This course allows students to explore concepts surrounding operation, setup, programming, and quality as applied to a wide range of Multi-axis CNC machines. It is the continuation and completion of more advanced subject matter first introduced in Multi-axis I.

MTTC 240 Machine Operations I

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 102 and MTTC 103. Students will gain additional classroom experience concerning band saws, engine lathes, vertical mills, surface grinders, Harig® Grinding Fixture, and jig grinder. Measurement and layout will be performed at an advanced level. Classroom activities will concentrate on heat-treatment of tool steels, classes of ANSI fits and tolerances, electrical discharge machining, carbide tooling and basic metal stamping die theory. Experience will also be gained in the calculation of labor and material costs. In addition, students will also be introduced to metal stamping die construction and conversational programming on CNC vertical mills. Students will also be required to create a comprehensive notebook due at the end of the semester.

MTTC 241 Machine Operations II

3 Credits

Prerequisites: MTTC 240. Emphasizes basic tool construction and close tolerance machining. Using the various types of equipment found in the laboratory, students rough machine, heat treat and precision grind detail parts to tolerance within 0.0005 consistently. Classroom activities concentrate on precision setup, inspection work and basic tool construction. Experience is gained in basic conversational CNC programming.

MTTC 242 CNC Machining

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 101 and MTTC 208 and MTTC 209 and MTTC 220. Introduces and instructs the student in all aspects of Computer Numeric Control (CNC) machining. The student will program, set up and operate CNC mills and lathes utilizing CAD/CAM for fixture and part design and verification. Students continually improve programming, set up and cycle time efficiency. Students inspect and document the quality of production parts and compare their performance with an industry benchmark for each project. This course incorporates mandatory certification assessment for the National Institute of Metalworking Skills CNC Turning: Programming Setup and Operations CNC Milling: Programming Setup & Operations Certification.

MTTC 243 Tool and Die Making I

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071 and MTTC 110 and MTTC 105; or FOUN 071 and MTTC 102 and MTTC 103 and MTTC 105. Focuses on construction of a two-stage progressive die that incorporates interchangeable details. Each student manufactures a die that incorporates the parting principle and performs the following operations: Forming, Piercing, and Parting. In addition, lecture material covers computations on blank lengths and diameters, blanking and piercing operations, drawing, progression, and timing. Experience is gained in CNC machining and progressive die troubleshooting.

MTTC 279 Machine Tool Capstone

1 Credit

Prerequisites: ENGL 111, and MATH 121 or MATH 122, and Program Chair Approval. This course provides students with the opportunity to develop strong professional presence skills, such as communication, networking, interviewing, and ethical problem solving. In this course, students will also take the CAAP exam.

NANO 100 Fundamentals of Nanotechnology

3 Credits

Corequisites: NANO 111. This course provides an introduction to the field of nanotechnology. The course starts with a review of the history of nanotechnology and continues with description of characterization techniques, top-down nanofabrication, bottom-up nanofabrication and impact of nanotechnology on other areas of science and technology.

NANO 102 Fundamentals of Nanotechnology II

3 Credits

Prerequisites: None. This course provides an overview of the materials, safety and equipment issues encountered in the practice of "top down" and "bottom up" nanofabrication. It focuses on safety, environmental and health issues in equipment operation and materials handling as well as on cleanroom protocol and vacuum technology. Topics to be covered include: vacuum technology, cleanroom operation, OSHA lab standard safety training, health issues, Biosafety Levels (BSL) guidelines, and environmental concerns.

NANO 111 Materials, Safety and Equipment Overview for Nanotechnology

3 Credits

Prerequisites: None. This course provides an overview of the materials, safety and equipment issues encountered in the practice of "top down" and "bottom up" nanofabrication. It focuses on safety, environmental and health issues in equipment operation and materials handling as well as on cleanroom protocol and vacuum technology. Topics to be covered include: vacuum technology, cleanroom operation, OSHA lab standard safety training, health issues, Biosafety Levels (BSL) guidelines, and environmental concerns.

NANO 200 Solid State Devices in Nanotechnology

3 Credits

Prerequisites: EECT 101. This course provides an overview of the fundamentals of circuit analysis, electronics, semiconductors and solid state devices. Course also includes topics in basic circuit elements, Ohm's law and kirchhoff's laws. After this introduction to basic concepts of circuits, the bonding model and energy band model will be introduced and then variety of semiconductor devices will be discussed.

NANO 202 Characterization and Testing of Nanotechnology Structures and Materials

3 Credits

Prerequisites: None. This course examines a variety of techniques and measurements essential for testing and for controlling material fabrication and final device performance. Characterization includes electrical, optical, physical, and chemical approaches. The characterization experience will include hands-on use of tools such as the Atomic Force Microscope (AFM), Scanning Electron Microscope (SEM) and Contact Angle devices.

NANO 203 Basic Nanotechnology Processes

3 Credits

Prerequisites: NANO 111. This course is the hands-on introduction to the processing involved in "top down", "bottom up", and hybrid nanofabrication. The majority of the course details a step-by-step description of the equipment, facilities processes and process flow needed to fabricate devices and structures. This hands-on exposure covers basic nanofabrication processes including colloidal chemistry, self-assembly, catalyzed nanoparticle growth, lithography, wet and dry etching, physical vapor deposition, and chemical vapor deposition.

NANO 204 Materials in Nanotechnology

3 Credits

Prerequisites: NANO 111 and NANO 202. This course is an in-depth, hands-on exposure to materials fabrication approaches used in nanofabrication. Students learn that these processes can be guided by chemical or physical means or by some combination of these. Hands-on exposure will include self-assembly; colloidal chemistry; atmosphere, low-pressure and plasma enhanced chemical vapor deposition; sputtering; thermal and electron beam evaporation; nebulization and spin-on techniques.

NANO 205 Patterning for Nanotechnology

3 Credits

Prerequisites: NANO 111, NANO 202 and NANO 203. This course is a hands-on treatment of all aspects of advanced pattern transfer and pattern transfer equipment including probe techniques; stamping and embossing; e-beam; and optical contact and stepper systems. The course is divided into five major sections: pattern generation processes; photolithography; particle beam lithographic techniques; probe pattern generation; and embossing lithography, step-and-flash, stamp lithography, and self-assembled lithography.

NANO 206 Materials Modification in Nanotechnology

3 Credits

Prerequisites: NANO 111, NANO 205. This course will cover in detail the processing techniques and specialty hardware used in modifying properties in nanofabrication. Material modification steps to be covered will include etching, functionalization, alloying, stress control and doping. Avoiding unintentional materials modification will also be covered as well as hands-on materials modification and subsequent characterization.

NANO 207 Bioapplications of Nanotechnology

3 Credits

Prerequisites: NANO 202 and NANO 204. This course examines the usage of nanotechnology for bioapplications. Students learn about the use of nanoparticles in biology and using nano-metrology techniques, like scanning electron microscopy and liquid atomic force microscopy, for bio-characterization. Focus is also given on functionalization, nano drug delivery systems, disease detection, and microfluidics. The potential health concerns of nanotechnology are also explored.

NANO 208 Patterning and Materials Modification for Nanotechnology

3 Credits

Prerequisites: NANO 202 and NANO 203. This course is an in-depth review of processing techniques and specialty equipment used in advanced pattern transfer and property modification in nanofabrication. Common and unique pattern transfer techniques will be studied with a focus on optical lithography. Materials modification through etching, functionalization, oxidation, and doping will also be covered.

NANO 290 Nanotechnology Internship

2 Credits

Prerequisites: Consent of program chair. This course is designed to be a supervised industry experience designed to allow students to work with the industry and research laboratory/production partners. It will apply and expand a student's nanotechnology skills and knowledge in a research or industrial setting. Students will work at different laboratory/production/educational facilities to gain hands-on practical experience unique to each industry type. Placement into internship experiences must be approved by both the program director and the industry partner. Students may be required to sign non-disclosure agreements in order to participate. Students will be expected to complete a minimum of 200 contact hours, and will be required to submit a final report. This is a capstone course for nanotechnology.

NETI 100 Network Communications

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. The course is intended to provide students with a basic understanding of fundamental concepts in networking. All layers of the OSI and TCP/IP Models are examined to illustrate concepts and to provide insight into data communications, networking and the Internet. Students are introduced to the principles and concepts of computer networking with primary emphasis on the application and transport layers.

NETI 105 Network Fundamentals

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 or ENGL 095. Covers the fundamentals of networking. Students will learn both the practical and conceptual skills that build the foundation for understanding basic networking. Human versus network communication are compared, and the parallels between them are presented. Students are introduced to the two major models used to plan and implement networks. The functions and services of the Open System Interconnection and Transport Control Protocol/Internet Protocol Models are examined in detail. Various network devices, network addressing schemes, and the types of media used to carry data across the network are also presented. Designed to be a study of local area networks, topologies, and functions while providing a general understanding of basic local area network protocols.

NETI 114 Workforce Preparation: Certification CompTIA Network+

1 Credit

Prerequisites: NETI 115. Corequisites: NETI 115. The workforce preparation course is focused on the CompTIA Network+ certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

NETI 115 Routing and Switching

3 Credits

Prerequisites: NETI 105. Covers the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. Students will be able to troubleshoot routers and switches and resolve common issues. Hands-on practical application will be included as preparation for the Cisco Certified Entry Networking Technician.

NETI 116 Workforce Preparation: Cisco Certified Entry Networking Technician (CCENT) Certification 1 Credit

Prerequisites: NETI 115. Corequisites: NETI 115. The workforce preparation course is focused on the Cisco Certified Entry Networking Technician (CCENT) Certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

NETI 120 Infrastructure Design – Logical and Physical 3 Credits

Prerequisites: NETI 105 Network Fundamentals. Corequisites: NETI 105 Network Fundamentals. Focuses on the structural and logical design, planning, installation, operation, maintenance and troubleshooting of Local Area Networks. Students will learn various copper and fiber optic cabling standards. Student will be provided a comprehensive coverage on current cabling methodologies.

NETI 181-194 Special Topics in Network Infrastructure 1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in introductory network infrastructure with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

NETI 205 Scaling Networks 3 Credits

Prerequisites: NETI 115. Covers the architecture, components, and operations of routers and switches in a complex network. Students learn how to configure routers and switches for advanced functionality. Students will be able to configure and troubleshoot routers and switches and resolve common issues. Students will also develop the knowledge and skills needed to implement network services and protocols.

NETI 215 Connecting Networks 3 Credits

Prerequisites: NETI 205. Covers the WAN technologies and network services required by converged applications in a complex network. Students will learn the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students will also develop the knowledge and skills needed to implement security and virtual private network operations in a complex network. Hands-on practical application will be included as preparation for the Cisco Certified Network Associate.

NETI 216 Workforce Preparation: Cisco Certified Network Associate (CCNA) Certification 1 Credit

Prerequisites: NETI 215. Corequisites: NETI 215. The workforce preparation course is focused on Cisco Certified Network Associate (CCNA) certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

NETI 245 Voice Over Internet Protocol 3 Credits

Prerequisites: NETI 115. Introduces students to the basics of VoIP and how voice is transported over IP networks. Students will examine VoIP signaling protocols, and explore topics such as jitter, latency, packet loss, quality of service tools and security. Students will gain hands-on experience setting up, maintaining and troubleshooting VoIP as part of network convergence.

NETI 250 Wireless LAN Networking 3 Credits

Prerequisites: NETI 115. Focuses on the design, planning, installation, operation, maintenance and troubleshooting of Wireless Local Area Networks. Students will learn various wireless protocols, radio frequency fundamentals, media access control standards, Wireless Local Area Networks management, performing site surveys, and implementing Wireless Local Area Networks security protocols.

NETI 281-294 Advanced Special Topics in Network Infrastructure 1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in network infrastructure with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

NGAS 101 Fundamentals of Natural Gas 3 Credits

Prerequisites: None. Introduces the characteristics and hazards of natural gas, prevention of accidental ignition, recognizing emergency conditions, inside and outside leak investigation methods and detection, instrumentation, carbon monoxide, and basic external corrosion prevention.

NGAS 102 Natural Gas Pipe Joining 3 Credits

Prerequisites: NGAS 101. Introduces the types of natural gas pipeline materials, joining techniques, coating maintenance, blowing gas scenarios, repair methods, and safety precautions.

NGAS 203 Natural Gas Regulatory and Compliance Issues

3 Credits

Prerequisites: None. The course covers the Department of Transportation regulations related to natural gas companies, including leak survey and patrol requirements.

NGAS 204 Natural Gas Construction Techniques

3 Credits

Prerequisites: NGAS 101. Introduces the methods used to locate and install natural gas lines, basic design theory, backfilling, purging, valve inspection and maintenance, pressure testing, customer regulations and relief design, explanation of hoop stress, shutting down the flow of gas, basic tapping and stopping techniques, construction equipment and current methods and common materials.

NRSNG 100 Fundamentals of Nursing

3 Credits

Prerequisites: Admission to a Nursing Program. Pre/Corequisite: APHY 102. Corequisite: NRSNG 115. Examines the roles of the licensed practical nurse and the registered nurse as members of the interdisciplinary health care team in today's healthcare systems. Provides an overview of essential components of the nursing process. Explores the nurse's role in providing for basic physiological, psychosocial, cultural, intellectual, and spiritual needs of patients. Introduces fundamental principles of therapeutic communication and teaching/learning

NRSNG 101 Fundamentals of Nursing Lab

1 Credit

Prerequisites: Admission to a Nursing Program. Corequisite: NRSNG 100. Simulated patient care provides an opportunity to develop the psychomotor skills necessary to provide nursing care to meet basic patient needs. Emphasis is placed on the use of standard precautions, provision of a safe care environment, and maintenance of patient privacy. Through simulation, basic principles of documentation are practiced.

NRSNG 102 Medical-Surgical Nursing

3 Credits

Prerequisites: Admission to a Nursing Program. Pre/Corequisite: APHY 102. Corequisite: NRSNG 115. Examines the roles of the licensed practical nurse and the registered nurse as members of the interdisciplinary health care team in today's healthcare systems. Provides an overview of essential components of the nursing process. Explores the nurse's role in providing for basic physiological, psychosocial, cultural, intellectual, and spiritual needs of patients. Introduces fundamental principles of therapeutic communication and teaching/learning.

NRSNG 103 Medical-Surgical Nursing I Lab

2 Credits

Prerequisites: NRSNG 100 and NRSNG 101. Corequisites: NRSNG 102 and NRSNG 105. Simulated patient care provides an opportunity to develop progressively complex nursing skills. Emphasis is placed on sterile technique, airway maintenance, nutritional and fluid support, elimination devices, specimen collection, medication administration, and drug dosage calculations.

NRSNG 105 Medical-Surgical Nursing I Clinical

2 Credits

Prerequisites: Admission to Program. Pre/Corequisites: NRSNG 100, APHY 102. Corequisites: NRSNG 102 and NRSNG 115. Provides the opportunity to apply nursing skills in diverse patient care situations. Emphasizes assessment skills in determining patient health status. Applies knowledge of etiology, pathophysiology, diagnostic tests, and assessment findings to identify patient needs.

NRSNG 106 Pharmacology for Nursing

3 Credits

Prerequisite: Admission to a nursing program or Nursing Dean/Chair approval. Examines principles of pharmacotherapeutic, pharmacodynamic, and pharmacokinetic properties of commonly prescribed drugs in each of the major drug classifications. Applies the nursing process to pharmacologic aspects of patient care. Examines national standards for safety in pharmacologic therapy. Presents dosage calculations.

NRSNG 110 Medical Surgical Nursing II

3 Credits

Prerequisites: NRSNG 102, NRSNG 105, NRSNG 115, APHY 102. Pre/Corequisite: NRSNG 106. Corequisites: NRSNG 111. Provides an understanding of the needs of adults experiencing increasingly complex alterations in health within the context of medical surgical concepts. Examines the roles of the licensed practical nurse and the registered nurse in applying the nursing process and implementing the ordered plan of treatment.

NRSNG 111 Medical Surgical Nursing II Clinical

2 Credits

Prerequisites: NRSNG 102, NRSNG 105, NRSNG 115, APHY 102. Pre/Corequisite: NRSNG 106. Corequisites: NRSNG 110. Allows the opportunity to apply theoretical knowledge to provide ethical, culturally competent, and holistic care for adults experiencing non-complex alterations in health. Emphasis is placed on the prevention of illness and the maintenance, promotion and restoration of health, as well as the support of death with dignity and implementation of the ordered treatment plan. The nursing process provides the framework for problem solving and critical thinking in providing nursing care.

NRSNG 112 Maternal-Child Nursing

3 Credits

Prerequisites: NRSNG 102, NRSNG 105, NRSNG 115, APHY 102. Pre/Corequisite: NRSNG 106. Corequisite: NRSNG 113. Applies knowledge of etiology and pathophysiology to provide an understanding of the health care needs of children and childbearing families. Examines the roles of the licensed practical nurse within the interprofessional team while applying the nursing process and implementing the ordered plan of treatment for children, childbearing, and child-rearing families. Introduces growth and development components and how they impact therapeutic communication, therapeutic interventions, and teaching-learning techniques when providing nursing care to children, childbearing, and child-rearing families.

NRSG 113 Maternal-Child Nursing Clinical

2 Credits

Prerequisites: NRSG 102, NRSG 105, NRSG 115, APHY 102. Pre/Corequisite: NRSG 106. Corequisite: NRSG 112. Allows the Practical Nursing student the opportunity to apply theoretical knowledge to provide ethical, culturally competent, and holistic care for children, childbearing, and child-rearing families. Emphasis is placed on the prevention of illness and the maintenance, promotion, and restoration of health as well as the support of death with dignity and implementation of the ordered plan of treatment. Knowledge of principles of growth and development are utilized to adapt therapeutic communication, therapeutic intervention, and reinforce teaching-learning techniques to provide nursing care to children, childbearing, and child-rearing families. The nursing process provides the framework for problem solving and critical thinking in providing nursing care.

NRSG 115 Nursing Lab

3 Credits

Prerequisites: Admission to a Nursing Program. Corequisites: NRSG 100, NRSG 102. Simulated patient care provides an opportunity to develop the psychomotor skills necessary to provide nursing care to meet basic patient needs. Emphasis is placed on the use of standard precautions, provision of a safe care environment, and maintenance of patient privacy and basic principles of documentation. Through the use of additional simulated patient care activities and mastery of basic care principles, students are provided the opportunity to develop progressively complex nursing skills to include sterile technique, airway maintenance, nutritional and fluid support, elimination devices, specimen collection, medication administration, drug dosage calculations, and more advanced principles of nursing documentation.

NRSG 116 Geriatric/Complex Medical Surgical Nursing III for the Practical Nurse

4 Credits

Prerequisites: NRSG 110, NRSG 111. Pre/Corequisite: NRSG 106. Corequisite: NRSG 106, NRSG 117. Applies previous knowledge of etiology and pathophysiology to provide an understanding of the health care needs of adults and geriatric patients experiencing complex alterations in health. Examines the role of the practical nurse in the acute care and long-term care setting. Relates principles of growth and development to the needs of geriatric patients. Examines leadership skills within the scope of practice for the licensed practical nurse.

NRSG 117 Geriatric/Complex Medical Surgical Nursing III for the Practical Nurse Clinical

2 Credits

Prerequisites: NRSG 110, NRSG 111. Pre/Corequisite: NRSG 106. Corequisites: NRSG 106, NRSG 116. Allows the opportunity to apply theoretical knowledge to provide safe, ethical, culturally competent, and holistic care for geriatric patients and adults experiencing complex alterations in health, within the context of all body systems. Emphasis is placed on the prevention of illness and the maintenance, promotion and restoration of health, as well as the support of death with dignity and implementation of the ordered plan of treatment. The nursing process provides the framework for problem solving and critical thinking in providing nursing care. Leadership activities for practical nurses in the long-term care setting are explored.

NRSG 122 Transition to ASN

5 Credits

Prerequisites: Admission to the ASN Program. Pre/Corequisites: APHY 102. Corequisites: NRSG 123 or NRSG 125. Examines the transition to the role of the registered nurse. Identifies components of the nursing program philosophy. Provides an overview of the five components of the nursing process, while emphasizing the assessment component. Reviews etiology, pathophysiology, clinical manifestations, and the diagnostic testing of common alterations in health within the context of all body systems. Explores application of the nursing process to care of adults experiencing increasingly complex health disorders.

NRSG 123 Paramedic Transition to ASN Lab/Clinical

3 Credits

Prerequisites: Admission to the ASN Program. Pre/Corequisite: APHY 102. Corequisites: NRSG 122. Examines the role of the registered nurse. Laboratory experience is provided to perform nursing skills and assist the student in identifying appropriate nursing responses to health needs. Emphasis will be placed on assessment skills. Clinical experiences are provided to assist the student in identifying appropriate nursing interventions for health needs.

NRSG 125 LPN Transition to ASN Lab

1 Credit

Prerequisites: Admission to the ASN Program. Corequisite: NRSG 122(only required if a graduate of Ivy Tech's Practical Nursing program greater than 2 years ago OR if a graduate from a Practical Nursing program outside Ivy Tech). Simulated patient care provides an opportunity to demonstrate the psychomotor skills necessary to provide nursing care to meet patient needs. Emphasis is placed on the use of standard precautions, provision of a safe care environment, and maintenance of patient privacy and principles of documentation. Students will validate previously learned skills and assessment.

NRSG 126 Mental Health Nursing

2 Credits

Prerequisites: NRSG 102, NRSG 105, NRSG 115. Pre/Corequisite: NRSG 106. Corequisites: NRSG 127. Builds upon previous knowledge of mental health concepts to provide an understanding of mental health disorders. Explores the role of the Associate Degree Nurse while using the nursing process to provide the framework for problem solving and critical thinking in providing nursing care in the mental health settings. Explores the ordered plan of care for mental health disorders. Identifies the nurse's accountability for the legal and ethical issues inherent in mental health nursing.

NRSG 127 Mental Health Nursing Clinical

1 Credit

Prerequisites: NRSG 102, NRSG 105, NRSG 115. Corequisites: NRSG 125, NRSG 126, NRSG 106. Allows the opportunity to apply theoretical knowledge to provide ethical, culturally competent, and holistic care for individuals experiencing mental health disorders. Demonstrates the role of the Associate Degree Nurse in utilizing the nursing process as the framework for problem solving and critical thinking in the application of nursing care in the mental health setting.

NRSG 128 Practice Issues for Practical Nursing

2 Credits

Prerequisites: NRSG 110, NRSG 111; all required general education courses must be completed. Explores strategies utilized to promote lifelong personal and professional development. Analyzes the roles of the licensed practical nurse within the context of the larger healthcare environment. Examines internal and external influences on nursing practice, including evidence based practice standards. Explores basic concepts of nursing leadership and management. Analyzes legal and ethical issues in healthcare.

NRSG 200 Complex Medical-Surgical Nursing for the ASN

3 Credits

Prerequisites: NRSG 106 and, depending on program track, must complete one of the following: NRSG 122 Introduction to ASN Transition (LPN to ASN track students who graduated from Ivy Tech greater than 2 years ago or who graduated from a Practical Nursing program outside Ivy Tech); OR NRSG 123 Paramedic to ASN Lab/Clinical (Paramedic to ASN track students); OR, NRSG 110 Medical Surgical Nursing II and NRSG 111 Medical Surgical Nursing II Clinical (ASN Traditional track students). Corequisite: NRSG 201. Applies previous knowledge of the etiology and pathophysiology of complex alterations in health in understanding the patient's health care needs within the context of all body systems. Examines the role of the registered nurse in applying the nursing process and implementing the ordered plan of treatment in acute care settings. Examines leadership skills in a variety of healthcare settings.

NRSG 201 Complex Medical Surgical Nursing for the ASN Clinical

4 Credits

Prerequisites: NRSG 106 and, depending on program track, must complete one of the following: NRSG 122 Introduction to ASN Transition (LPN to ASN track students who graduated from Ivy Tech greater than 2 years ago or who graduated from a Practical Nursing program outside Ivy Tech); OR NRSG 123 Paramedic to ASN Lab/Clinical (Paramedic to ASN track students); OR, NRSG 110 Medical Surgical Nursing II and NRSG 111 Medical Surgical Nursing II Clinical (ASN Traditional track students). Corequisites: NRSG 200. Allows the opportunity to apply theoretical knowledge to provide ethical, culturally competent, and holistic care for adults experiencing complex alterations in health within the context of all body systems. Emphasis is placed on the prevention of illness and the maintenance, promotion and restoration of health, as well as the support of death with dignity and implementation of the ordered plan of treatment. The nursing process provides the framework for problem solving and critical thinking in providing nursing care. Leadership concepts utilized in the management of direct patient care are explored.

NRSG 206 Nursing Care of Childbearing and Childrearing Families

4 Credits

Prerequisites: NRSG 106 and, depending on program track, must complete one of the following: NRSG 122 Introduction to ASN Transition (LPN to ASN track students who graduated from Ivy Tech greater than 2 years ago or who graduated from a Practical Nursing program outside Ivy Tech); OR NRSG 123 Paramedic to ASN Lab/Clinical (Paramedic to ASN track students); OR, NRSG 110 Medical Surgical Nursing II and NRSG 111 Medical Surgical Nursing II Clinical (ASN Traditional track students). Corequisite: NRSG 207. Applies knowledge of etiology and pathophysiology to provide an understanding of the health care needs of children and childbearing families. Examines the roles of the registered nurse in applying the nursing process and implementing the ordered plan of treatment for childbearing and childrearing families. Introduces growth and development components and how they impact therapeutic communication, family development theories, principles of family nursing, therapeutic interventions, and teaching-learning techniques when providing nursing care to children and child-rearing families.

NRSG 207 Nursing Care of Childbearing and Childrearing Families Clinical

2 Credits

Prerequisites: NRSG 106 and, depending on program track, must complete one of the following: NRSG 122 Introduction to ASN Transition (LPN to ASN track students who graduated from Ivy Tech greater than 2 years ago or who graduated from a Practical Nursing program outside Ivy Tech); OR NRSG 123 Paramedic to ASN Lab/Clinical (Paramedic to ASN track students); OR, NRSG 110 Medical Surgical Nursing II and NRSG 111 Medical Surgical Nursing II Clinical (ASN Traditional track students). Corequisite: NRSG 206. Allows the opportunity to apply theoretical knowledge to provide ethical, culturally competent, and holistic care for children and childbearing families. Emphasis is placed on the prevention of illness and the maintenance, promotion, and restoration of health as well as the support of death with dignity and implementation of the ordered plan of treatment. Knowledge of principles of growth and development, family development, and family nursing are utilized to adapt therapeutic communication, therapeutic intervention, and teaching-learning techniques to provide nursing care to children and childrearing families. The nursing process provides the framework for problem solving and critical thinking in providing nursing care.

NRSG 208 Practice Issues for Associate Degree Nursing

2 Credits

Prerequisites: NRSG 200 and NRSG 201 or NRSG 206 and NRSG 207; all required general education courses must be completed. Explores strategies utilized to promote lifelong personal and professional development. Analyzes the roles of the registered nurse within the context of the larger healthcare environment. Examines internal and external influences on nursing practice, including evidence based practice standards. Explores basic concepts of nursing leadership and management. Analyzes legal and ethical issues in healthcare. This is a capstone course for the Nursing Program for the Associate Degree.

OPTI 111, Optical Concepts and Properties

3 Credits

Prerequisites: Program Chair Approval. This entry level course will introduce the student to fundamental principles and properties concerning basic optics. The course includes lecture and laboratory studies containing formulas and exercises used in basic optical concepts of the eye and ophthalmic lenses including geometrical optics and refraction.

OPTI 121 Ophthalmic Lens Laboratory Procedures

3 Credits

Prerequisites: OPTI 111. Course content includes lecture and laboratory instruction in the finishing of ophthalmic lenses and related topics. This course will provide students with the optical procedures, mathematical equations, and lens designs used in the fabrication of eyewear meeting national optical standards, including equipment and frames. At the conclusion of the course students will have the knowledge and ability to fabricate a finished pair of glasses that is visually pleasing and of optical quality.

OPTI 131 Ophthalmic Optics

3 Credits

Prerequisites: OPTI 111. This course is a continuation of optical theory from OPTI 111 covering the properties of light and the function of a lens in visual correction. This includes lecture and laboratory instruction on the optical characteristics and design of standard ophthalmic lenses including prismatic effects and specialized visual correction using these lenses.

OPTI 151 Ophthalmic Procedures

3 Credits

Prerequisites: Program Chair Approval. This course is designed to present the basic fundamentals, terminology, instrumentation, and practical procedures used in evaluating the visual system. Topics include patient pre-exam testing, correctly recording the data of test results and interacting with different patient types.

OPTI 153 Ophthalmic Dispensing

3 Credits

Prerequisites: Program Chair Approval. Course content includes lecture and laboratory instruction in the areas of frame types, parts, and facial measurements for fitting, cosmetic and functional aspects of frame selection, alignment, adjusting, repair and eyewear ordering including lenses. Lecture portion of course will include guest speakers on topics related to different career choices within the field.

OPTI 155 Introduction to Clinic

1 Credit

Prerequisites: OPTI 151 Ophthalmic Procedures, OFAD 121 Office Procedures and Team Dynamics.

This course is designed to introduce the student to different career choices and expectations of job placement in the optical field. Students will learn basic optometric office flow and functions. This interactive course will include student participation with current topics and job shadowing in different career options within the field.

OPTI 201 Anatomy and Physiology of the Eye

1 Credit

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 Introduction to College Writing and ENGL 083 Reading Strategies for College or ENGL 095 Integrated Reading and Writing and MATH 023 Essentials of Algebra I or MATH 080 Mathematics Principles with Algebra. Corequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 Essentials of Algebra I or MATH 080 Mathematics Principles with Algebra. Develops an understanding of the structural organization of the human eye, orbit, and adnexa. Introduces students to the physiology involved in vision, including the vascular, muscular, and neural systems relating to vision and early visual processing. Students will also briefly touch on common pathological eye conditions in children and adults.

OPTI 232 Contact Lens and Ocular Refractive Corrections

3 Credits

Prerequisites: OPTI 201. Course content is designed to provide the student with the understanding of basic contact lens concepts and technical skills to assist in the care of the contact lens patient.

OPTI 251 Ophthalmic Procedures II

3 Credits

Prerequisites: OPTI 151. Course content is a continuation of OPTI 151 furthering the knowledge and techniques used in an ophthalmic practice. The course will emphasize advanced procedures important in the field of refraction, tonometry, visual field testing, and slit lamp evaluation.

OPTI 254 Clinic Practicum I

4 Credits

Prerequisites: OPTI 151, OPTI 251, OPTI 232, OPTI 201, OPTI 155. Course content is designed to integrate the student's educational and technical experience. Under the supervision of experienced practitioners, students will gain practical experience in various types of ophthalmic health care settings including private practice, retail optical and a wholesale optical laboratory.

OPTI 255 Clinic Practicum II

4 Credits

Prerequisites: OPTI 254. This course is a continuation of Practicum I, furthering the students experience in a supervised ophthalmic health care setting. In Practicum II, the student will have the opportunity to observe and interact in more specialized settings including ophthalmology, surgery, research and ophthalmic sales.

ORTH 101 Introduction to Orthotics and Prosthetics

3 Credits

Prerequisites: None. Focuses on the development of knowledge necessary to understand the rehabilitation process as it relates to the delivery of orthotic/prosthetic care. The prosthetic and orthotics professions are presented in terms of the integration of the biological, medical, and engineering sciences as well as the clinical and technical components of the disciplines. Students will develop a solid foundation of the principles and practice of orthotics and prosthetics and the materials and technology associated with the manufacture of custom devices.

PAET 107 Unmanned Aerial Vehicles in Precision Agriculture

3 Credits

Prerequisites: None. Presents an in-depth overview of Unmanned Aerial Vehicles (UAV) and their use in precision agriculture and other industries. The course focuses on different types of UAV and their different uses.

PARA 106 Tort Law

3 Credits

Prerequisites: LEGS 101. Tort Law concerns the law of non-criminal injuries to persons or property. This course also addresses policy considerations that affect Tort Law. Topics include negligence, strict liability, product liability, intentional torts, affirmative defenses, and pre-trial investigation techniques and resources.

PARA 107 Contracts and Commercial Law

3 Credits

Prerequisites: LEGS 101. Contracts and Commercial Law examines the nature of contracts and commercial law under both the common law and the Commercial Code of Indiana. Topics include contracts for sales of goods (UCC Article 2), the Statute of Frauds, performance, remedies, warranties, and assignment law.

PARA 108 Property Law

3 Credits

Prerequisites: LEGS 101. Property Law is a survey of the law of real and personal property in Indiana. Property law concepts are analyzed. Topics include the different types of property, estates in land, concurrent ownership, legal descriptions and deeds, easements, encumbrances on title, title searches and title insurance, real estate purchase agreements, closings, mortgages and UCC Article 9 security interests, foreclosures, landlord-tenant law, and personal property law topics such as bailments, lost property, and intellectual property. This is an introductory course in real and personal property law for paralegal majors.

PARA 155 Law Office Technology

3 Credits

Prerequisites: PARA 101. Corequisites: PARA 101. Students will receive hands-on instruction regarding the components of hardware and various software programs; understand the ethical issues that surround the use of technologies; various legal programs; office management skills, as well as obtain an understanding of the sources of technology used in litigation and the courtroom.

PARA 204 Legal Writing

3 Credits

Prerequisites: PARA 101. The primary purpose of the course is to develop the student's legal writing skills. The student will be exposed to various legal writing techniques that are used in drafting a wide variety of legal documents. Throughout the semester, a strong emphasis is placed on proper writing methodology and formatting.

PARA 205 Business Associations

3 Credits

Prerequisites: LEGS 101. Introduces the student to the various forms of business entities, including sole proprietorships, general and limited partnerships, limited liability companies (LLC's), and business corporations. Topics include key concepts of law (the relationship between principals and agents), the scope of employment doctrine, and respondeat superior, the distinguishing characteristics of common business entities, the formal requirements for establishing and doing business in various types of business organizations in Indiana, respective advantages and disadvantages of each type, and relevant tax issues. Students will review sample business formation documents and will draft a general partnership agreement.

PARA 209 Family Law

3 Credits

Prerequisites: LEGS 103. An introduction to the Indiana law of marriage, dissolution, custody (including UCCJA), visitation, support (including URESA), adoption, and guardianship of minors. Students will review many pleadings and intake forms and will draft a divorce petition, a financial statement, a summary decree with child support worksheet.

PARA 210 Wills, Trust, and Estates

3 Credits

Prerequisites: LEGS 101. Concerns the law of wills and trusts, the administration of estates, and guardianships according to Indiana common law and the provisions of Titles 29, 30 and Title 6 (death taxes) of the Indiana Code. Students study the intestate succession; the elements of a valid will, of a valid trust, and laws of will construction.

PARA 211 Criminal Law and Procedure

3 Credits

Prerequisites: LEGS 101 or CRIM 101. A theoretical and practical survey of the statutory and case law of crimes, defenses, evidence, and criminal procedure in Indiana, including application of the law to factual scenarios. Topics include the elements of specific crimes, formal procedures the structure of the American court system and the theories behind punishment and victimization.

PARA 212 Bankruptcy Law

3 Credits

Prerequisites: LEGS 101. A survey of the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 (BAPCPA), with a focus on consumer bankruptcy cases. The course emphasizes how to accumulate the debtor's financial information; compile petition, schedules, statement of financial affairs, and other documents to be filed with the Court; collect and organize data for the first meeting of creditors; complete proofs of claim; and pursue creditors' rights. Students are required to prepare a bankruptcy case under Chapter 7 or 13 of the Bankruptcy Code. A brief overview of Chapters 11 and 12 of the Bankruptcy Code is included.

PARA 214 Constitutional Law

3 Credits

Prerequisites: LEGS 101. This course is an introduction to the constitutional law of the United States of America, with an emphasis on the decisions of the U.S. Supreme Court. This course explores various methodologies of constitutional interpretation and modes of constitutional analysis. Topics covered include the history of the Articles of Confederation, the history of the Constitution of the United States, the role of the judiciary, the separation of powers and relations among the federal branches of government, the powers of the national government and federalism based on Congress and the states and individual constitutional rights. The projects will include writing three (3) case briefs, one (1) memorandum of law and one (1) memorandum of points and authorities.

PARA 220 Evidence

3 Credits

Prerequisites: PARA 103. Examines the rules and policies governing a trial court's fact-finding process, as exemplified by the Indiana Rules of Evidence and the Federal Rules of Evidence. The scope of the course will focus on the individual Rules and the paralegal's role in using the Rules in litigation assistance. Topics also include evidence gathering and the use of technology and how it impacts the paralegal's use of obtaining such evidence.

PARA 224 Legal Writing II

3 Credits

Prerequisites: LEGS 102 and PARA 204. The primary purpose of the course is to develop the student's legal writing skills. The student will learn how to write sharp, clear prose and to become more proficient and efficient at composing, organizing, and summarizing a wide variety of legal written documents. The student will be exposed to various legal writing techniques that are used in drafting a wide variety of legal documents. Throughout the semester, a strong emphasis is placed on proper legal writing methodology and formatting.

PARA 255 Practicum

3 Credits

Prerequisites: Program Advisor Approval. An opportunity for the intermediate paralegal student to acquire valuable field experience by working under attorney supervision. The student keeps a journal and prepares a report of his or her experience at the end of the semester.

PARA 279 Paralegal Studies Capstone Coursed

2 Credits

Prerequisites: LEGS 101. This course was designed to prepare students for the Certified Legal Assistant's Exam (CLA), by the National Association of Legal Assistants (NALA). The purpose of this is to allow students the opportunity to become certified after obtaining their A.A.S. in Paralegal Studies. This course will help sharpen test-taking skills and hone in on various areas of law that are tested.

PARA 280 Internship

1-5 Credits

Prerequisites: Paralegal Faculty Approval. An opportunity for intermediate paralegal student to acquire valuable field experience by working under attorney supervision. The student keeps a journal and prepares a report of his or her experience at the end of the semester.

PARA 281-294 Special Topics

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in the legal field and occupations. Identifies and offers various special topics during each term under this course number.

PARM 102 Emergency Medical Technician

7.5 Credits

Prerequisites: Completion of the ACCUPLACER placement exam; 18 years of age prior to course; completion; Copy of high school diploma or GED must be supplied by course completion; Completion of the College Health Examination Form and required immunizations and tests, regionally determined; Current Health Care Provider CPR card. The course is based on the training program developed by the Department of Transportation and the Emergency Medical Services Commission of Indiana. It covers theories, techniques and operational aspects of pre-hospital emergency care within the scope and responsibility of the emergency medical technician (EMT). It requires laboratory practice and clinical observation in a hospital emergency room and ambulance. Successful completion of the course meets Indiana requirements to test for certification as an EMT.

PARM 105 Basic Ambulance Internship

2 Credits

Prerequisites: PARM 102. Students will participate in a field internship that provides on the job experience in all phases of pre-hospital basic life support. All skills tested by the National Registry Exam will be formally reviewed and practiced. A general review of the total EMT-Basic curriculum will be presented. The student's practical skills experienced through PARM 102 and this course must demonstrate competency in the objectives listed as required by the National Standard Curriculum, DOT, 1998.

PARM 111 Preparatory**3 Credits**

Prerequisites: APHY 101, certification, or pending, as an EMT – B, course application and physical exam on file, completion of the College Health Examination Form and regionally required immunizations and tests, successful completion of entrance requirements as determined by regional affiliates. The legal, moral and ethical responsibilities of the health care professional are introduced. An overview of the Emergency Medical Services System and its components and their relationships is presented. The essential principles of the standard of care, medical liability, areas of potential medical liability and medical liability protection are introduced. An overview of stress, reactions to stress, anxiety, paramedic job stress and dealing with death and dying is discussed. The essentials of pathophysiology and how the understanding of disease processes will improve upon the level of care provided by the paramedic are explained.

PARM 112 Prehospital Pharmacology**3 Credits**

Prerequisites: PARM 111. The introduction of drug information, action of drugs, weights and measures and the administration and techniques of administering drugs. The essentials of venous access, therapeutic communications and lifespan development are also included.

PARM 115 Airway, Patient Assessment**3.5 Credits**

Prerequisites: PARM 112 and APHY 101. The fundamentals of airway management including airway anatomy and physiology, assessment, management, ventilation, and suction are emphasized. General patient assessment, initial management including scene survey, initial assessment, resuscitation, focused/detailed exam, history, definitive field management, and re-evaluation are also introduced.

PARM 116 Clinical Application I**1.5 Credits**

Prerequisites: PARM 112. Provides experiences in a hospital environment or other medical setting under supervision. Provides the opportunity to practice and perform patient assessment, endotracheal intubation, intravenous access techniques, and therapeutic communication techniques in the emergency department, surgery, and other appropriate clinical areas.

PARM 200 Trauma**3 Credits**

Prerequisites: PARM 115. An overview of kinematics, primary survey, resuscitation, secondary survey and management, monitoring and transporting trauma victims. The pathophysiology of shock, care of shock and victim oxygenation are covered. It defines parameters and discusses anatomy and physiology as related to burn injury, presents pathophysiology related to a specific source of burn injury and presents patient-related detail assessment and specific management of burns. A regionally determined trauma certification (PHTLS or ITLS) must be earned during this course.

PARM 210 Medical I**6 Credits**

Prerequisites: PARM 115. Pulmonology, respiratory management and pharmacological interventions are covered in detail. Cardiology and dysrhythmia recognition relative to pre-hospital intervention are emphasized. Advanced Cardiac Life Support (ACLS) certification must be earned during this course.

PARM 213 Medical II**5 Credits**

Prerequisites: APHY 102 and PARM 115 Corequisite: APHY 102. Etiology and treatment of medical emergencies associated with the nervous, endocrine and reproductive systems are reviewed. The course includes presentation of allergies and anaphylaxis, gastroenterology, toxicology, infectious and communicable diseases, environmental conditions and behavioral and psychiatric disorder.

PARM 215 Special Considerations**3.5 Credits**

Prerequisites: PARM 116 213. Corequisites: PARM 213. Pediatrics, geriatrics and interventions for the chronic care patient and assessment based management are covered. A regionally determined pediatric certification (PALS, PEPP, or EPC) must be earning during this course.

PARM 216 Clinical Applications II**1.5 Credits**

Prerequisites: PARM 116. Provides experiences in a hospital environment or other medical setting under supervision. Provides the opportunity to practice and perform patient assessment, endotracheal intubation, suctioning of upper and lower airway, delivery of aerosolized medications, administration of medications via various enteral and parenteral routes, intravenous access techniques, interpretation of electrocardiogram tracings, and therapeutic communication techniques in the emergency department, critical care units, behavioral units, and other appropriate clinical areas.

PARM 219 Clinical Applications III**1.5 Credits**

Prerequisites: PARM 216. Provides experiences in a hospital environment or other medical setting under supervision. The emphasis is on gaining experience in the management of neonatal, pediatric, and obstetric patients. Provides opportunities to practice assessment, communication and management with patients ranging from neonate to young adult and opportunities to observe live births and perform assessment of obstetric patients are also available. Assessing the critically ill patient and assisting with care in specialty intensive care units and the burn unit is included.

PARM 220 Operations**2.5 Credits**

Prerequisites: PARM 213. An awareness of the concepts of rescue and the preparation for a response to a scene/incident is provided. The essentials of crime scene awareness, medical incident command and hazardous materials operations are presented.

PARM 221 Ambulance Internship

6 Credits

Prerequisites: PARM 219. Students will participate in a field internship that provides on the job experience in all phases of prehospital advanced life support. All skills tested by the National Registry Exam will be formally reviewed and practiced. A general review of the total paramedic curriculum will be presented. Student's practical skills experienced through Clinical Application I, Clinical Application II, Clinical Application III, and this course must demonstrate competency in the objectives listed as required by the current National Standard Curriculum.

PARM 225 Indiana Primary Instructor Preparation

3 Credits

Prerequisites: Copy of high school diploma or GED must be supplied by course completion; completed Training Institution Approval Form; letter(s) documenting minimum of at least one year of experience in the delivery of emergency medical care in the prehospital setting; copy of Indiana certification as EMT-B or higher (certification period must be one year or more); pass EMT-B written and practical skills with the appropriate score. This course is based on the training program developed by the Department of Transportation and the Emergency Medical Services Commission of Indiana. It covers theories, teaching techniques and research aspects of teaching pre-hospital emergency care program at basic emergency medical technician (EMT-B) level. It is the certification required by the state of Indiana for an individual wishing to teach at the EMT-B level.

PHAR 101 Pharmacy Technician I

3 Credits

Prerequisites: HLHS 101 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023, and Chair approval. Corequisites: PHAR 201. Prerequisite or Corequisite: HLHS 115. Introduces principles, career concepts, and skills needed to be a successful pharmacy technician in the state of Indiana. Provides a working knowledge of most aspects of pharmacy in community, institution, and other practice settings.

PHAR 201 Pharmacy Technician II

3 Credits

Corequisites: PHAR 101. This course focuses on entry-level skills performed by the pharmacy technician in various pharmacy settings. The student will engage in hands-on practice of activities typically performed by a pharmacy technician in a community, institution, or other pharmacy setting. Topics include information sources, reviewing and processing prescriptions, application of rules and regulations, institutional pharmacy, nonsterile compounding, and aseptic technique. Essential pharmacy calculations are presented with an emphasis on the development of problem-solving skills.

PHAR 202 Pharmacy Technician Experiential Seminar

3 Credits

Prerequisites: APHY 102, PHAR 101, PHAR 201; Program Advisor Approval. Corequisites: APHY 102. Provides the opportunity to observe, discuss and perform basic pharmacy related procedures under supervision, with learning experiences that prepare the student for practice in retail pharmacies and/or hospitals. Problem-solving skills are emphasized including pharmacy calculations and the use of information from written prescription orders. Prepares the student for national certification examination.

PHIL 101 Introduction to Philosophy

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Introduces the student to recurring ideas and thought systems represented in the literature and lives of great thinkers and examines philosophical principles such as foundations of morality, skepticism, the nature of knowledge, the nature of mind, free will and determinism, and the existence of God. Emphasizes evaluation of arguments and analysis of concepts.

PHIL 102 Introduction to Ethics

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Introduces the student to the ethical domain as a field of philosophy by examining major concepts such as happiness, virtues and rules and applies them to practical moral problems.

PHIL 213 Logic

3 Credits

Prerequisites: ENGL 111. Introduces the student to logic as a field of philosophy by examining the structure of argument and applying critical thinking skills.

PHIL 220 Philosophy of Religion

TransferIN 3 Credits

Prerequisites: ENGL 111. Analyzes issues basic to understanding religion, including the problem of evil, free will and divine foreknowledge, arguments for the existence of God, relationship of faith and reason, and arguments for personal immortality. ***Students who apply to and are admitted in to the American Honors Program at Ivy Tech, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.***

PHLB 212 Phlebotomy

3 Credits

Prerequisites: APHY 101, HLHS 101 and HLCS Program Chair Approval. Presents the principles and practices of laboratory specimen collection and processing. Also covers medical terminology, infection control, patient identification, anatomy and physiology, anticoagulants, blood collection, specimen processing and interpersonal skills.

PHLB 257 Phlebotomy Externship

2 Credits

Prerequisites: APHY 102, PHLB 212 and Professional CPR/AED certification and HLCS Program Chair Approval. Corequisites: APHY 102. Provides the opportunity to discuss and perform phlebotomy procedures under supervision with learning experiences obtained in selected laboratories, physician offices, clinics, or hospitals.

PHLB 258 Phlebotomy Donor Technician Externship

2 Credits

Prerequisites: PHLB 212 and Professional CPR/AED certification and HLCS Program Chair Approval. Provides the opportunity to discuss and perform phlebotomy procedures under supervision with learning experiences obtained in selected laboratories, physician offices, clinics, or hospitals.

PHOT 100 Photography for Non-Majors

3 Credits

Prerequisites: None. Covers basic black and white photographic theory and technique. Includes basic black and white darkroom processes and physics of light and filters. Studies camera and lenses, characteristics of films and papers and the chemistry of emulsions, exposure, and development.

PHOT 104 Basic Photography

3 Credits

Prerequisites: None. Covers basic photographic theory and technique. Includes image capture, processing, various output methods and physics of light. Study of cameras, lenses, exposure, characteristics of photographic media and output. Appropriate presentation, software options, and sequencing of imagery are stressed, with historical examples that provide background for understanding the medium.

PHOT 107 Intermediate Photography

3 Credits

Prerequisites: PHOT 104. This course further develops advanced camera skills and photographic vision. Special attention is placed on the practice and theory of the zone system. The course introduces special techniques and digital processes while refining printing and processing skills. It will also emphasize good composition and the use of photography as a communication tool. Appropriate presentation, software options, and sequencing of imagery are stressed, along with historical examples that provide background for understanding the medium.

PHOT 200 Field Photography

3 Credits

Prerequisites: Instructor Approval. This course develops photographic skills out in the field. Emphasis will be placed on a variety of situations, on-location, which photographers may be faced with in the photographic profession. Which could include photographing state parks, the zoo, sporting events, theatrical productions, concerts, botanical gardens, and metropolitan areas. The course introduces equipment and techniques unique to photographing out in the field.

PHOT 201 Principles of Color Photography

3 Credits

Prerequisites: PHOT 104 and VISC 102. Develops color photographic skills using current equipment and techniques. Encompasses color psychology and aesthetics as well as the physics of light in color photography. Color photographic theory will be emphasized. Appropriate presentation, software options, and sequencing of imagery are stressed, with historical examples that provide background for understanding the medium.

PHOT 203 Professional Portraiture

3 Credits

Prerequisites: PHOT 209. Explores approaches and methods in traditional and alternative portraiture in studio and on-location photography. Emphasizes creative approaches to commercial portraiture as well as lighting and posing for corrective portraiture.

PHOT 204 Commercial Photography Techniques

3 Credits

Prerequisites: PHOT 209. Introduces more advanced studio and lab techniques used in advertising and industrial photography. Emphasizes creative problem solving applications toward advanced commercial photographic assignments.

PHOT 208 Independent Study I

3 Credits

Prerequisites: PHOT 104 and PHOT 106. Provides advanced students with opportunities to research and design projects for specified areas of interest. Requires the project plan to be approved by the instructor. Restricts work to student program area and requires it to be portfolio quality.

PHOT 209 Studio Lighting Techniques

3 Credits

Prerequisites: PHOT 107 and VISC 102. Corequisite: PHOT 107. Further explores multiple lighting set-ups, studio electronic flash, location lighting, and special effects. Emphasis will be put on conceptualizing the photograph from start to finish.

PHOT 214 Journalistic and Editorial Photography

3 Credits

Prerequisites: PHOT 104. Gives students the opportunity to photograph events and human interest features to gain experience in contributions to various publications. Emphasizes establishing visual relationships in the photo essay.

PHOT 216 Advanced Processes and Production Techniques

3 Credits

Prerequisites: PHOT 104. Introduces specialized lab/alternative process techniques in traditional and digital formats. Works with contemporary experimental darkroom and digital techniques. Covers issues in prepress production as they relate to the photographer.

PHOT 218 Fine Art Photography**3 Credits**

Prerequisites: PHOT 104. Examines current issues in non-commercial photography. Explores attitudes of photographers and critics on a wide range of topics through directed reading, class discussion, and gallery visits. Appropriate presentation, software options, and sequencing of imagery are stressed, with historical examples that provide background for understanding the medium.

PHYS 100 Introductory Physics**4 Credits**

Prerequisites: MATH 100 or MATH 122 or MATH 123. An introductory course that introduces the concepts and applications of physics and their role in our daily life. Leads students to develop an integrated understanding of the theory and applications of measuring (or unit) systems, scalars, vectors, force, work, rates, energy, power, simple machines, vibrations and waves. Emphasizes understanding concepts, factual knowledge, computation, and application. Includes lab.

PHYS 101 Physics I**Transfer IN 4 Credits**

Prerequisites: MATH 121 or MATH 137. Introduces the basic concepts of mechanics, including force and torque, linear and rotational motion, work, energy and power, fluids, and the physics of heat. Includes lab.

PHYS 102 Physics II**Transfer IN 4 Credits**

Prerequisites: PHYS 101. Introduces the physics of light, periodic and wave motion, electricity and magnetism, and concepts of modern and current physics. Includes lab.

PHYS 220 Mechanics**Transfer IN 5 Credits**

Prerequisites: MATH 211. A calculus based physics course that provides a detailed analysis of uniform and accelerated motion; Newton's laws; gravitation and planetary motion; energy; momentum; conservation principles; circular motion; angular momentum; dynamics of rotation; statics; hydrostatics and hydrodynamics; simple harmonic motion and wave motion. Includes lab.

PHYS 221 Heat, Electricity and Optics**Transfer IN 5 Credits**

Prerequisites: PHYS 220 and MATH 212. A calculus based physics course that provides a detailed analysis of heat and energy; kinetic theory; elementary thermodynamics; heat transfer; electrostatics; electric current; AC and DC circuit analysis; electromagnetism; magnetic properties of matter; geometrical and physical optics. Includes lab.

PHYS 222 Modern Physics**5 Credits**

Prerequisites: PHYS 221. A calculus based physics course that emphasizes modern physics topics including the theories of special and general relativity, an introduction to quantum mechanics, as well as atomic, condensed matter, nuclear, and elementary particle physics. Includes lab.

PLAS 101 Introduction to Plastics**3 Credits**

Prerequisites: None. Introduction to the main plastic processing industries, techniques, and commonly used polymers.

PLAS 106 Plastic Materials and Testing**3 Credits**

Prerequisites: PLAS 101. Introduces structure, properties, and processing characteristics of plastic polymers and additives.

PLAS 107 Injection Molding**3 Credits**

Prerequisites: PLAS 101. Expands the student's knowledge of injection molding process, components, and industry.

PLAS 108 Extrusion Process**3 Credits**

Prerequisites: PLAS 101. Introduces the extrusion processes, equipment and industrial applications.

PLAS 201 Advanced Injection Molding**3 Credits**

Prerequisites: PLAS 107. Covers the procedures and techniques necessary to fully utilize the capabilities of modern injection molding equipment to properly process thermoplastic materials.

PLAS 202 Advanced Extrusion**3 Credits**

Prerequisites: PLAS 108. Expands the student's knowledge of extrusion processes, equipment and industrial application.

PLAS 208 Computer Applications in Plastics**3 Credits**

Prerequisites: PLAS 107 and PLAS 108. Introduces the computer products and services available to aid in the design and manufacturing of plastic products.

PLAS 209 Manufacturing of Plastics Products**3 Credits**

Prerequisites: PLAS 107 and PLAS 108. Covers the economic, organizational, and quality control strategies employed by production technicians to maximize efficiency in plastics manufacturing operations.

POLS 101 Introduction to American Government and Politics

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in (ENGL 093 and ENGL 083) or ENGL 095. Studies federalism, theories of the origins and purposes of government and other aspects of the American government including interest groups, political parties, and the electoral process. Emphasis is placed on constitutional backgrounds and the organization and functions of the executive, legislative, and judicial segments of the national government, civil liberties and civil rights, public opinion, media, bureaucracies, and domestic and foreign policy.

POLS 112 State and Local Government

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course covers the basic organization and operation of state and local governments. Topics include federalism, state constitutions, courts, governors, legislatures, elections, campaign finance, interest groups, local governments, budgets and taxes, education and law enforcement.

POLS 201 Introduction to Political Science

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Introduces students to the basic principles of political science, government and its institutions, international relations, political philosophy, and political theory. Emphasis on the impact of economy, culture, history, and environment on political behavior/events.

POLS 210 Personal Law

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course examines the basis and principles of our legal system, how legal decisions are made and how they affect citizens' lives. Topics to be covered include federal and state jurisdictions, criminal and civil law and procedures, freedom of speech, press and religion, privacy rights, workplace rights, property rights, the role of juries in our legal system and the death penalty.

POLS 211 Introduction to World Politics

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course investigates the interaction of modern international political institutions, leaders, and events. Further discussion includes comparative analysis from a global perspective and the impact of international relations on individual lives.

POLS 220 Public Administration

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. This course focuses on bureaucracy in the federal government and its relation to local and state agencies.

PPTC 101 Power Plant Fundamentals

3 Credits

Prerequisites: None. An introduction to power plant systems emphasizes the use of schematics and diagrams in discussing power plant systems and identifying major components including boilers, turbines, generators, condensers, pumps, and auxiliary equipment. Also includes the study of pre-heaters, feed water, superheat, and reheat systems. Plant safety training and workplace procedures will also be emphasized.

PPTC 102 Power Plant Mechanical Equipment

3 Credits

Prerequisites: None. Introduces the various pieces of mechanical equipment found in power plants including compressors, pumps, fans, blowers, valves, heat exchangers, power transmission equipment and turbines. Mechanical concepts of work, force, and torque will be used to describe equipment operation and performance. Studies basic types of bearings, seals, and lubrication used in power plant equipment. Mechanical assembly drawings and diagrams will be utilized to understand equipment operation and function.

PPTC 103 Power Plant Electrical Equipment

3 Credits

Prerequisites: INDT 113 or ADMF 113. Introduces the study of electrical equipment and systems used in power plants. Topics include three phase power, generators, motors, transformers, and switching gear. NEC and NESC Code requirements, automatic and manual motor controls, variable speed drives, and circuit protection will also be studied.

PPTC 121 Power Plant Steam Systems

3 Credits

Prerequisite: PPTC 101 and demonstrated competency through appropriate assessment or a grade of "C" or better in MATH 044 or MATH 015 or FOUN 071. Studies the use of steam as a means of transferring energy and doing work. It will include principles of boiler operation to produce steam and the use of thermodynamics to understand the behavior and properties of a steam system. Major components will be studied along with how they play a role in the steam generation process. The class will include steam safety with principles of maintenance for use in troubleshooting and maintaining

PPTC 201 Power Plant Instrumentation and Control

3 Credits

Prerequisites: INDT 113 or ADMF 113 and PPTC 101. Introduces the basic principles of process instrumentation and control systems. Includes the measurement parameters such as flow, pressure, level, temperature, and pH. Studies the use of programmable logic controllers, process controllers, and distributed control systems that are interfaced with sensors and actuators to maintain process stability.

PPTC 210 Gas Turbines**3 Credits**

Prerequisites: PPTC 101. Introduces the student to combined-cycle gas and steam turbine power plants. It includes information on system layout, controls, operation, and maintenance.

PPTC 221 Advanced Power Plant Systems**3 Credits**

Prerequisites: PPTC 101 and PPTC 121. Examines online boiler control concepts, including combustion, feed water, header pressure, oxygen content, power demand, and other processes as applied to industrial power generation and process heat supply. Students study power plant cycles, thermodynamic properties of water, and steam. Also examines pollution control systems, gas turbine, and diesel generators.

PRCM 279 Professional Communication Capstone**1 Credit**

Prerequisites: Successful completion of 40 program hours and Program Advisor approval. Provides a culminating experience designed to demonstrate the student's mastery of information literacy; ethical and responsible behavior; political, social and environmental responsibility; and diversity awareness, both in general and in professional communication. May require a research project, presentation, and/or portfolio. Requires students to complete two sections of a college-approved standardized assessment of proficiency in math, writing, scientific inquiry, and/or critical thinking.

PROC 131 Introduction to Process Technology**3 Credits**

Prerequisites: None. Introduction to power plant systems including boiler, turbine, generator, condenser, pumps, and auxiliary equipment. Emphasizes the use of schematics and diagrams in discussing plant systems. Includes plant safety training.

PROC 132 Process Technology I (Equipment)**3 Credits**

Prerequisite: PROC 131. Provides an overview of the equipment and tools used in the process industry; including piping, tubing, hoses and fittings, valves, pumps, compressors, turbines, motors and engines, power transmission and lubrication, heat exchangers, cooling towers, furnaces and boilers, filters and dryers, vessels, and process diagrams. Students will be introduced to many process-related equipment concepts, such as purpose, components, operation, and the process technician's role for operating and troubleshooting the equipment.

PROC 133 Process Technology II (Systems)**3 Credits**

Prerequisites: PROC 132. Provides an overview of the equipment and tools used in the process industry; including piping, tubing, hoses and fittings, valves, pumps, compressors, turbines, motors and engines, filters and dryers, vessels, and process diagrams. Students will be introduced to many process-related equipment concepts, such as purpose, components, operation, and the process technician's role for operating and troubleshooting the equipment.

PROC 134 Process Technology III (Operations)**3 Credits**

Prerequisites: PROC 133. Provides an overview of the field of operations within the process industry. Students will use existing knowledge of equipment, system, and instrumentation to understand the operation of an entire unit. Students study concepts related to commissioning, normal startup, normal operations, normal shutdown, turnarounds, and abnormal situations as well as the process technician's role in performing the tasks associated with these concepts within an operating unit.

PROC 231 Safety, Health, and Environment I**3 Credits**

Prerequisites/Corequisites: PROC 131. Provides an introduction to the field of safety, health, and environmental concerns within the process industry. Within this course, you will be introduced to various types of plant hazards, safety and environmental systems and equipment, and the regulations under which processing plants are governed.

PROC 232 Principles of Quality**3 Credits**

Prerequisite: PROC 131. Provides an introduction to the field of quality within the process industry. Students will be introduced to many process industry-related quality concepts including operating consistency, continuous improvement, plant economics, team skills, and statistical process control (SPC).

PROC 233 Process Instrumentation I**3 Credits**

Corequisites: PROC 132. Provides an introduction to the field of Instrumentation and covers process variables and the various instruments used to sense, measure, transmit, and control those variables. This course also introduces control loops and the elements that are found in different types of loops, such as controllers, regulators, and final control elements. The course concludes with a study of instrumentation drawings and diagrams and a unit on troubleshooting instrumentation.

PROC 234 Process Troubleshooting**3 Credits**

Prerequisite: PROC 133. Course involves instruction in the different types of process technology troubleshooting techniques, procedures, and methods used to solve process problems. Topics include application of data collections and analysis, cause-effect relationships, and reasoning.

PSYC 101 Introduction to Psychology

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083.

Corequisites: ENGL 073 or ENGL 075 and ENGL 111. The course focuses on biological foundations, learning processes, research methodologies, personality, human development and abnormal and social psychology. *Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.*

PSYC 102 Advanced Introduction to Psychology

3 Credits

Prerequisites: PSYC 101. Continuation of PSYC 101. Addresses advanced topics regarding the methods, data, and theoretical interpretations in the areas of learning, sensory psychology, and psychophysiology. Presents specific theoretical issues, research methods, and findings in the areas of developmental, social, personality, and abnormal psychology.

PSYC 201 Lifespan Development

TransferIN 3 Credits

Prerequisites: PSYC 101 and ENGL 111. Examines human growth and development through the prenatal, child, adolescent, and adult stages of life. Physical, emotional, psychosocial, and cognitive influences from conception to death will be addressed.

PSYC 205 Abnormal Psychology

Transfer IN 3 Credits

Prerequisites: PSYC 101 and ENGL 111. Examines theories and research related to abnormal behavior with primary emphasis on symptoms, etiology, and treatment of psychological disorders. *Students who apply and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.*

PSYC 210 Drugs and Human Behavior

3 Credits

Prerequisites: PSYC 101 and ENGL 111. Examines theories and research related to human drug use and abuse. Drug pharmacology; physiological effects of drugs on the nervous system; social and psychological issues affecting drug abuse; the treatment, effects, prevention of substance abuse; and therapeutic uses of drugs in mental illness addressed.

PSYC 211 Research Methods in Psychology

3 Credits

Prerequisites: PSYC 101 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or MATH 080. The course will familiarize students with the basic concepts, techniques, and problems associated with conducting research in psychology. Students will be provided with the analytical and critical thinking skills required to design, conduct, and interpret empirical research. Problems specific to research in psychology will be explored.

PSYC 240 Human Sexuality

TransferIN 3 Credits

Prerequisites: PSYC 101. Considers sexuality from an historic, scientific, evolutionary and psychosocial perspective including sex research and methods, biological bases of sexuality, sexual behavior, sexuality and the life cycle, sexual problems, and social issues.

PSYC 253 Introduction to Social Psychology

Transfer IN 3 Credits

Prerequisites: PSYC 101 or SOCI 111. The study of social psychology as a science, and how social psychologists study the interactions within and between individuals, social groups and institutions. This course cross-lists with SOCI 253.

PSYC 260 Health Psychology

3 Credits

Prerequisites: PSYC 101. An introduction to health and emphasizing mind-body issues, the biopsychosocial model and cognitive behavioral theory. The course will emphasize research methods and current practice related to stress and pain, as well as health related behaviors. Within the course, treatment approaches, behavioral risk factors and public health issues will be addressed.

PTAS 101 Introduction to the Physical Therapist Assistant

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in required 0 level English and/or math courses. Explores history and concepts of physical therapy, physical therapist assistant and rehabilitative medicine. Introduces fundamentals of patient care including universal standard precautions; body substance isolation; OSHA guidelines, patient assessment including vital signs; body mechanics; and patient handling with applications of physics principles. Includes preparation of patients, treatment areas, equipment.

PTAS 102 Diseases, Trauma and Terminology

3 Credits

Prerequisites: APHY 101, PTAS 101, and PTAS 107. Explores diseases and trauma which necessitate physical therapy for the client. Medical terminology, anatomy, physiology, psychology, disabilities and physics related to these conditions are discussed along with instrumentation, implants and fixation devices. Provides students with the opportunity to explore their own reactions to illness and disability and to discuss how to recognize patients' and families' reactions to illness and disability.

PTAS 103 Administrative Aspects of the Physical Therapist Assistant **3 Credits**

Prerequisites: PTAS 107. Addresses the legal and ethical aspects of physical therapist assistant and patient care along with charting, documentation, report writing, patient history procurement, record keeping, charges, insurance information including diagnostic and procedure coding, third party reimbursement, Medicare, Medicaid, electronic claims and patient rights including American Disabilities Act policy and architectural barriers identification. Discusses current issues in health care provision. Explores patient, family, and professional communication techniques, body language and electronic communication, techniques in patient teaching. Includes performing within limitations of scope of skills, basic principles of levels of authority and responsibility, planning, time management, supervisory process, performance evaluations, policies and procedures.

PTAS 106 Treatment Modalities I **5 Credits**

Prerequisites: APHY 101 and PTAS 101 and concurrent enrollment or successful completion of PTAS 107. Continues concentration on the fundamentals of patient care including universal precautions, assessment of vital signs, body mechanics and patient positioning. Includes lectures, demonstrations and simulated patient problems in the laboratory portion of the course. Studies new techniques in depth, such as gait training, gait device selection, goniometry range of motion exercises and measuring. Introduces various modalities including hydrotherapy, thermotherapy, massage, traction and intermittent compression techniques. Safety factors are emphasized in both the lectures and the laboratories. The laboratory provides the setting for the practice and implementation of theories and techniques of PTAS 106. Students practice assessments and treatment methods on themselves and one another under the guidance and supervision of the laboratory instructor.

PTAS 107 Kinesiology **5 Credits**

Prerequisites: PTAS 101 and APHY 101. Introduces the physical therapist assistant student to the science of kinesiology. By definition, kinesiology is the study of movement. Studies human movement and brings together fields of anatomy, physiology, physics and geometry. Prerequisite knowledge of skeletal and muscular anatomy and physiology is necessary. Class consists of equal parts of lectures, demonstration and student participation in locating, observing and palpating various bony prominences and musculatures. Much of kinesiology requires independent study to memorize origin, insertion, action and innervation of all muscles. Knowledge gained in this course is an integral part of the students' background preparation for the practice of physical therapy.

PTAS 115 Clinical I **2.5 Credits**

Prerequisites: PTAS 102, PTAS 103, PTAS 106, PTAS 201, and Program Advisor Approval. Requires the student to perform in a clinical environment with patients, using applications of theory and techniques of PTAS 106, under the guidance of a registered physical therapist.

PTAS 201 Treatment Modalities II **3 Credits**

Prerequisites: PTAS 106 and PTAS 107. Reviews joint structure, muscle origins, insertions, innervations, actions and physiology. Covers normal and abnormal gait, joint replacement, and postural correcting exercise along with treatment principles and therapeutic exercises for the neck, back, and peripheral joints. Discusses general exercise principles and progression of the orthopedic patient through an exercise program. Addresses appropriate applications of principles of physics and kinesiology.

PTAS 202 Treatment Interventions for Special Populations **2 Credits**

Prerequisites: PTAS 201, PTAS 115. Reviews musculoskeletal, integumentary, and vascular systems and diseases and disorders including anatomy, physiology, data collection strategies, and treatment implementation. Covers normal and abnormal gait with review of orthotic recommendation, fit, and training and prostheses recommendation, fit, and training following vascular and/or traumatic amputation. Reviews the application of therapeutic exercise for special populations related to vascular and integumentary system disorders. Discusses general exercise principles and progression for special populations.

PTAS 205 Clinical II **6 Credits**

Prerequisites: PTAS 115, PTAS 217 and Program Advisor Approval. Requires the student to perform in a clinical environment with patients using applications of theories and techniques of PTAS 202 and PTAS 217, under the guidance of a registered physical therapist.

PTAS 215 Clinical III **6 Credits**

Prerequisites: PTAS 205 and Program Advisor Approval. Requires the student to perform in a clinical environment with patients using applications of theory and techniques of PTAS 202 and PTAS 217 under guidance of a registered physical therapist.

PTAS 217 Treatment Modalities III **5 Credits**

Prerequisites: PTAS 201 and PTAS 115. Provides an in-depth approach to therapeutic exercise as performed by the physical therapy assistant. Covers basic anatomy and physiology of the central and peripheral nervous systems and activities of daily living. Includes exercise physiology and neurophysiology and advanced principles and procedures of therapeutic exercise appropriate for cardiopulmonary, cardiovascular, orthopedic and neurologic conditions, stroke, spinal cord and peripheral nerve injuries. Discusses prevention measures, specialized techniques and the utilization of specialized therapeutic equipment and correlates them to exercise applications. Addresses appropriate applications of kinesiology and principles of physics. Provides practice and implementation of theories and techniques of PTAS 106 and PTAS 202 in the lab setting.

PTAS 224 Current Issues and Review

1 Credit

Prerequisites: Successful completion of all required General Education courses and Program Advisor Approval. Teaches sources of physical therapy research and discusses the recognition of roles and responsibilities of physical therapy assisting. Requires completion and presentation of an independent project. Includes a comprehensive review of the course to prepare the student for relicensure exam.

QUAL 101 Quality Control Concepts and Techniques I

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 015, or MATH 023, or MATH 050, or FOUN 071. Covers current quality control concepts and techniques in industry with emphasis on modern manufacturing requirements. Studies the fundamental tools of Statistical Process Control which are used in industry to reduce costs and increase productivity at a predictable quality level. Emphasizes principles and techniques of SPC to ensure prevention instead of detection of problems is practiced. Includes basic statistical and probability theory, sampling techniques, process control charts, the nature of variation, histograms, attributes, and variable charts.

QUAL 102 Statistical Process Control

3 Credits

Prerequisites: FOUN 071. Studies the fundamental tools of statistical process control which are used in industry to reduce costs and increase productivity at a predictable quality level. Emphasizes principles and techniques of statistical process control to ensure that prevention instead of detection of problems is practiced. Includes basic statistical and probability theory, sampling techniques, process control charts, the nature of variation, histograms, and attribute and variable charts.

QUAL 105 Non-Destructive Testing Application

3 Credits

Prerequisites: None. Presents an overview of the relationship of nondestructive testing to the total quality function. Includes advantages and limitations of various test methods including liquid penetrate, magnetic particle, ultrasound, and eddy current.

QUAL 201 Advanced Statistical Process Control

3 Credits

Prerequisites/Corequisites: QUAL 102. Builds on the basic principles of QUAL 101 with advanced techniques by industry to ensure economic production of goods based on defect prevention rather than defect detection. Covers the various decisions to modify, change or adjust the process based on statistical evidence. Stresses interpretation of statistical data and distinguishing between common and special causes of problems. Emphasizes appropriate use of control charts, trend analysis, assessing process and machine capability, evaluating the measurement process, using computers, and implementation techniques.

QUAL 202 Quality Control Concepts and Techniques II

3 Credits

Prerequisites: QUAL 101, MATH 122. Acquaints students with quality control systems. Emphasizes the systems approach to quality, establishing the quality system and applying total quality control in the company.

QUAL 204 Total Quality Management

3 Credits

Prerequisites: None. Teaches the philosophy of total quality management. Focuses on improving processes and reducing variation in systems. Covers management's role in improving aspects of manufacturing and service organization to achieve quality improvement.

QUAL 206 ISO/QS International Standards

3 Credits

Prerequisites: FOUN 071. Teaches the basic principles of ISO 9000 standards, QS 9000 standard, ISO 14000 standard. Includes instruction on internal auditing with emphasis on the role of the internal auditor in regard to the maintenance of the quality systems.

QUAL 210 Quality Management Principles

3 Credits

Prerequisites: None. Stresses the management concept relating to employee attitudes, motivation and job satisfaction, as well as philosophies, styles of leadership, and team building as they relate to quality objectives.

RADL 101 Patient Care and Radiation Protection for Limited Chiropractic Radiography

3 Credits

Prerequisites: Acceptance into the program through appropriate assessment. Introduces the limited chiropractic profession of radiology and the practitioner's role in the health care setting. It prepares students for entry into a clinical setting as a Limited Radiography Chiropractic machine operator. Identifies the responsibilities for protecting patients, personnel, and the public from excessive radiation exposure.

RADL 102 Imaging Equipment and Radiation Production for Limited Chiropractic Radiography

3 Credits

Prerequisites: Acceptance into the program through appropriate assessment. Imaging Equipment and Radiation production - presents fundamentals of x-ray tube construction, basic circuitry of x-ray machine atomic structure, and properties of x-rays.

RADL 103 Anatomy and Positioning Vertebral Column for Limited Chiropractic Radiography

3 Credits

Prerequisites: RADL 101 and 102. Content is designed to provide a knowledge base necessary to perform standard radiographic vertebral column procedures within the limited chiropractic scope of practice. The clinical manifestations of pathologic processes, their radiographic appearance and relevance to radiographic procedures will be introduced. Laboratory experience will be used to complement the didactic portion.

RADL 104 Image Production and Digital Image Acquisition for Limited Chiropractic Radiography 3 Credits

Prerequisites: RADL 101 and RADL 102. Content is designed to provide a knowledge base in factors that govern and influence the production and recording of radiologic images. Film/screen imaging with related accessories will be emphasized. Content is also designed to provide the components, principles and operation of cassette-based and cassette-less imaging systems found in diagnostic radiology. Factors that affect image acquisition, display, archiving and retrieval are discussed.

RADL 105 Clinical I for Limited Radiography 2 Credits

Prerequisites: Acceptance into the program through appropriate assessment. Content and clinical practice experiences shall be designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of radiologic procedures. Through structured sequential, competency-based assignments in clinical setting, concepts of team practice, patient-centered clinical practice and professional development shall be discussed, examined and evaluated.

RADL 106 Patient Care and Radiation Protection for Limited Podiatric Radiography 3 Credits

Prerequisites: Acceptance into the program through appropriate assessment. Introduces the limited podiatric profession of radiology and the practitioner's role in the health care setting. It prepares students for entry into a clinical setting as a Limited podiatric radiographer. Identifies the responsibilities for protecting patients, personnel, and the public from excessive radiation exposure.

RADL 107 Imaging Equipment and Radiation Production for Limited Podiatric Radiography 3 Credits

Prerequisites: Acceptance into the program through appropriate assessment. Imaging Equipment and Radiation production - presents fundamentals of x-ray tube construction, basic circuitry of x-ray machine atomic structure, and properties of x-rays.

RADL 108 Anatomy and Positioning for Limited Podiatry 1 Credit

Prerequisites: RADL 106 and RADL 107. Content is designed to provide a knowledge base necessary to perform standard radiographic foot and ankle procedures within the limited podiatric scope of practice. The clinical manifestations of pathologic processes, their radiographic appearance and relevance to radiographic procedures will be introduced. Laboratory experiences will be used to complement the didactic portion.

RADL 109 Image Production and Digital Image Acquisition for Limited Podiatric Radiography 3 Credits

Prerequisites: RADL 106 and RADL 107. Content is designed to provide a knowledge base in factors that govern and influence the production and recording of radiologic images. Film/screen imaging with related accessories will be emphasized. Content is also designed to provide the components, principles and operation of cassette-based and cassette-less imaging systems found in diagnostic radiology. Factors that affect image acquisition, display, archiving and retrieval are discussed.

RADL 110 Clinical I for Limited Podiatric Radiography 2 Credits

Prerequisites: RADL 106 and RADL 107. This course offers students an opportunity to experience patient procedures in a sufficient volume, variety, and frequency within anatomic areas to develop skills that support competent exam performance.

RADT 111 Orientation and Patient Care 5 Credits

Prerequisites: Acceptance into the program through appropriate assessment. Introduces the profession of radiology and the practitioner's role in the health care system. It also provides students with the basic concepts of patient care dealing with the emotional and physical needs of the patients including infection control and standard precautions.

RADT 112 Image Production and Evaluation I 3 Credits

Prerequisites: RADT 111, RADT 113, RADT 114, and RADT 117. Content is designed to establish a knowledge base in factors that govern and influence the production and recording of radiologic images. Film and electronic imaging with related accessories will be emphasized. The mathematical calculations of x-ray technique will be taught along with the operations of darkrooms and developing equipment commonly used in the field.

RADT 113 Radiographic Positioning I and Lab 3 Credits

Prerequisites: Acceptance into the program through appropriate assessment. An introduction to and familiarize the student with the basic routines of radiographic positioning, shielding techniques, and related terminology. Actual radiographs are included for analysis of proper positioning and overall image quality.

RADT 114 Radiographic Clinical Education I 3 Credits

Prerequisites: Acceptance into the program through appropriate assessment. Content and clinical practice experiences shall be designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of radiologic procedures. Through structured sequential, competency-based assignments in clinical setting, concepts of team practice, patient-centered clinical practice and professional development shall be discussed, examined and evaluated. Clinical practice experiences shall be designed to provide patient care and assessment, competent performance of Radiologic imaging and total quality management. Levels of competency and outcomes measurement shall ensure the well being of the patient preparatory to, during, and following the radiologic procedure.

RADT 115 Radiographic Positioning II and Lab

3 Credits

Prerequisites: RADT 111, RADT 113, RADT 114, RADT 117. Corequisites: RADT 117. Content is designed to provide a knowledge base necessary to perform standard radiographic procedures along with the application to special studies. Consideration will be given to the production of images of optimal diagnostic quality. Laboratory experience should be used to complement the didactic portion.

RADT 116 Radiographic Clinical Education II

3 Credits

Prerequisites: RADT 111, RADT 113, RADT 114, RADT 117. Corequisites: RADT 117. Content and clinical practice experiences shall be designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of radiologic procedures. Through structured sequential, competency-based assignments in clinical setting, concepts of team practice, patient-centered clinical practice and professional development shall be discussed, examined and evaluated.

RADT 117 Radiation Physics and Equipment Operation

3 Credits

Prerequisites: Admission to the program through appropriate assessment, MATH 136, and Program Chair/Department Chair Approval. COREQUISITES: MATH 136. Content is designed to establish a basic knowledge of atomic structure and terminology. Also presented are the nature and characteristics of radiation, x-ray production and the fundamentals of photon interactions with matter.

RADT 201 Radiographic Positioning III and Lab

3 Credits

Prerequisites: RADT 113, RADT 115. Corequisites: RADT 115. Content is designed to provide a knowledge base necessary to perform standard radiographic procedures along with the application to special studies. Consideration will be given to the production of images of optimal diagnostic quality. Laboratory experience should be used to complement the didactic portion.

RADT 202 Radiographic Clinical Education III

4 Credits

Prerequisites: RADT 115, RADT 116, RADT 201, RADT 206. Corequisites: RADT 201. Content and clinical practice experiences shall be designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of radiologic procedures. Through structured sequential, competency-based assignments in clinical setting, concepts of team practice, patient-centered clinical practice and professional development shall be discussed, examined and evaluated. Clinical practice experiences shall be designed to provide patient care and assessment, competent performance of Radiologic imaging and total quality management. Levels of competency and outcomes measurement shall ensure the well-being of the patient preparatory to, during and following the radiologic procedure.

RADT 203 Radiographic Clinical Education IV

4 Credits

Prerequisites: RADT 112, RADT 201, RADT 202. Corequisites: RADT 112. Content and clinical practice experiences shall be designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of radiologic procedures. Through structured sequential, competency-based assignments in clinical setting, concepts of team practice, patient-centered clinical practice and professional development shall be discussed, examined and evaluated. Clinical practice experiences shall be designed to provide patient care and assessment, competent performance of Radiologic imaging and total quality management. Levels of competency and outcomes measurement shall ensure the well-being of the patient preparatory to, during and following the radiologic procedure.

RADT 204 Radiographic Clinical Education V

4 Credits

Prerequisites: RADT 203, RADT 209, RADT 218, RADT 221. Content and clinical practice experiences shall be designed for sequential development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of radiologic procedures. Through structured sequential, competency-based assignments in clinical setting, concepts of team practice, patient-centered clinical practice and professional development shall be discussed, examined and evaluated. Clinical practice experiences shall be designed to provide patient care and assessment, competent performance of Radiologic imaging and total quality management. Levels of competency and outcomes measurement shall ensure the well-being of the patient preparatory to, during and following the radiologic procedure.

RADT 206 Radiobiology and Radiation Protection

3 Credits

Prerequisites: RADT 111, RADT 113, RADT 114, RADT 117. Corequisites: RADT 117. Covers theories and principles of the effects of ionizing radiation upon living tissues. Includes dosages, measurements, DNA structures and functions, cellular radiosensitivity. Overview of principles of radiation protection covered.

RADT 209 Radiographic Positioning IV

3 Credits

Prerequisites: RADT 201 and RADT 202. Content is designed to provide a knowledge base necessary to perform standard radiographic procedures along with the application to special studies. Consideration will be given to the production of images of optimal diagnostic quality. Laboratory experience should be used to complement the didactic portion.

RADT 218 Image Production and Evaluation II

3 Credits

Prerequisites: RADT 112, RADT 201, RADT 202. Explains phototiming and its relationship to manual techniques. Associates kVp and mAs with the quality and quantity of radiation. Covers standard darkroom procedure, automatic processing, fluoroscopy and quality assurance.

RADT 221 Pharmacology and Advanced Procedures

2 Credits

Prerequisites: RADT 201. Cover theories and principles of current imaging modalities. Content is also designed to cover contrast media along with the theory and basic technique of venipuncture. The role of the radiographer during medical emergencies is also addressed in this course.

RADT 299 General Exam Review

3 Credits

Prerequisites: RADT 201, RADT 202. Cover theories and principles of current imaging modalities. Content is also designed to cover contrast media along with the theory and basic technique of venipuncture. The role of the radiographer during medical emergencies is also addressed in this course.

RDTH 100 Introduction to Radiation Therapy

2 Credits

Prerequisites: Admission to the Radiation Therapy program. Content is designed to provide the student with an overview of the foundations in radiation therapy and the practitioner's role in the health care delivery system. This course will provide students with a historical overview of radiation therapy and its role in medicine. An introduction to radiation therapy treatment techniques, equipment, terminology, and professional responsibilities will be included.

RDTH 110 Virtual Simulation Lab

1 Credit

Prerequisites: Admission to the Radiation Therapy Program. Corequisite: RDTH 100. The purpose of this course is to further introduce the student to procedures performed in Radiation Therapy, and to provide the student with greater opportunities to gain practical experience. During this first semester, the student is expected to develop the competency to perform simple clinical procedures with progressively less assistance. Emphasis continues to be given to the development of professional responsibility and the practice of total patient care and radiation safety practices.

RDTH 120 Sectional Anatomy and Imaging Principles

2 Credits

Prerequisites: APHY 101. Content is designed to provide students with an introduction to cross-sectional anatomy of the human body and principles related to appropriate imaging modalities. This course will demonstrate the clinical application as well as anatomical terminology. A focus on Computed Tomography with an overview of Magnetic Resonance Imaging, Positron Emission Tomography, and Ultrasound will be introduced. Case studies will be presented in order to apply the knowledge of sectional anatomy and imaging modalities with what is seen during clinical rotations.

RDTH 145 Clinical Externship I

1 Credit

Prerequisites: Admission to the Radiation Therapy program. Corequisite: RDTH 100. Introduces the student to procedures performed in Radiation Therapy, and provides the student with greater opportunities to gain practical experience. During this first semester of clinical education, the student is expected to develop the competency to perform simple clinical procedures with progressively less assistance. Emphasis continues to be given to the development of professional responsibility and the practice of total patient care and radiation safety practices.

RDTH 150 Patient Care in Radiation Oncology

3 Credits

Prerequisites: None. Corequisite: RDTH 100. Provides the student with basic concepts of patient care specific to radiation therapy including consideration of physical and psychological conditions. Handling of patients, patient examinations, asepsis, local and systemic reactions, nutrition and medications are discussed. Factors influencing patient health during and following a course of radiation will be identified.

RDTH 155 Clinical Externship I

3 Credits

Prerequisites: RDTH 110. Introduces the student to procedures performed in Radiation Therapy, and provides the student with greater opportunities to gain practical experience. During this second semester of clinical education, the student is expected to develop the competency to perform simple to intermediate clinical procedures with progressively less assistance. Emphasis continues to be given to the development of professional responsibility and the practice of total patient care and radiation safety practices.

RDTH 220 Techniques and Applications in Radiation Therapy

3 Credits

Prerequisites: RDTH 100. Content is designed to provide the student with the basic concepts of dosimetry and treatment planning. Various external beam techniques and applications, depth dose data, and summation of isodose curves are discussed. Modalities of treatment, patient setup, dose measurement, dose calculation and verification are also included.

RDTH 223 Radiobiology and Safety

2 Credits

Prerequisites: RDTH 100. Introduces the student to the fundamentals of radiobiology and the effects of radiation on living tissue. Course evaluates effects of radiation from the cellular level, to the epidemiological effects on communities and potential offspring. Topics in radiobiology include basic radiation interactions, cellular biology review, short and long-term effects of radiation, case studies, risk factors, containment and handling of live sources, reduction of patient dose, radiation monitoring and applicable regulations.

RDTH 225 Clinical Externship II

4 Credits

Prerequisites: RDTH 155. Introduces the student to procedures performed in Radiation Therapy, and provides the student with greater opportunities to gain practical experience. During this third semester of clinical education, the student is expected to develop the competency to perform simple to intermediate clinical procedures with progressively less assistance. Emphasis continues to be given to the development of professional responsibility and the practice of total patient care and radiation safety practices.

RDTH 230 Pathology and Treatment Principles I

2 Credits

Prerequisites: RDTH 100. Provides the student with the fundamentals of each disease process. Malignant conditions, etiology and epidemiology, patient workup and methods of treatment are discussed. Attention is given to patient prognosis, treatment results and the effects of combined therapies.

RDTH 232 Radiation Therapy Physics

3 Credits

Prerequisites: RDTH 220. Establishes a basic knowledge of physics pertinent to developing an understanding of radiations used in the clinical setting. Fundamental physical units, measurements, principles, atomic structure and types of radiation are emphasized. Also presented are the fundamentals of x-ray generating equipment, x-ray production and its interaction with matter.

RDTH 233 Research Methodology in Radiation Oncology

1 Credit

Prerequisites: RDTH 100. Introduces the student to the logic, method, variation and precision of thought required in the practice and/or consumption of research.

RDTH 235 Clinical Externship III

5 Credits

Prerequisites: RDTH 225. Introduces the student to procedures performed in Radiation Therapy, and provides the student with greater opportunities to gain practical experience. During this fourth semester of clinical education, the student is expected to develop the competency to perform simple to intermediate clinical procedures with progressively less assistance. Emphasis continues to be given to the development of professional responsibility and the practice of total patient care and radiation safety practices.

RDTH 240 Pathology and Treatment Principles II

2 Credits

Prerequisites: RDTH 100 and RDTH 230. Provides the student with the fundamentals of several more disease processes. Malignant conditions, etiology and epidemiology, patient workup and methods of treatment are discussed. Attention is given to patient prognosis, treatment results and the effects of combined therapies.

RDTH 241 Treatment Planning

2 Credits

Prerequisites: RDTH 220. Provides the student with the concepts of dosimetry and treatment planning. Various external beam techniques and applications, depth dose data, and summation of isodose curves are discussed. Modalities of treatment, patient setup, dose measurement, dose calculation and verification are also included.

RDTH 242 Quality Management in Radiation Oncology

1 Credit

Prerequisite: RDTH 232. Focuses on the evolution of quality management (QM) programs and continuing quality improvements in radiation oncology. Topics will include the need for quality assurance (QA) checks; QA of the clinical aspects and chart checks; film checks; the various types of evaluations and tests performed on simulators, megavoltage therapy equipment and therapy planning units; the role of radiation therapists in quality management programs; legal and regulatory implications for maintaining appropriate QM guidelines as well as the role computers and information systems serve within the radiation oncology department.

RDTH 243 Radiation Therapy Capstone Course

2 Credits

Prerequisites: RDTH 223, RDTH 232, and RDTH 240. Integrates the various professional courses into a single perspective as it relates to radiation oncology. Professional concerns will be addressed and attention will be given to issues related to the workplace, continued professional development, and the need for lifelong learning. Extensive review of programmatic material will be the focus of this course. Extensive review of physics, protection and radiation therapy procedures is covered.

RDTH 245 Clinical Externship IV

3 Credits

Prerequisites: RDTH 235. Allows the student to become proficient in all radiation therapy clinical procedures. During this fifth semester of clinical education, the students are further introduced to dosimetry procedures and are expected to have attained competency to perform all clinical procedures independently, under the direct supervision of a qualified professional or radiation therapist. Emphasis continues to be given to the development of professional responsibility and the practice of total patient care and radiation safety practices.

RDTH 260 Principles and Practice of Proton Therapy

5 Credits

Prerequisite: Acceptance into the program. Content is designed to provide the student with the knowledge and concepts used in proton therapy. Topics covered include practical applications of using protons and dosimetric concepts involved in treating patients. Immobilization techniques and accessory fabrication are also discussed. This course will address quality management, physics, radiobiology and regulatory procedures as they pertain to the field. Emphasis continues to be given on the professional and social intricacies of cancer care.

RDTH 261 Proton Therapy Lab Practicum

5 Credits

Corequisite: RDTH 260. Extensive integration of proton therapy concepts and treatment procedures is the primary emphasis of this course. The student will be introduced to common treatment procedures performed in a proton therapy department. During this lab course the student will gain practical experience and develop the competency necessary to perform a variety of procedures in a controlled environment on phantom patients. Emphasis continues to be given to the development of professional responsibility and the practice of total patient care.

RDTH 265 Proton Therapy Clinical Experience

3 Credits

Corequisites: RDTH 260 and RDTH 261. Purpose of course is to further introduce the student to procedures performed in proton therapy and to provide the student with the opportunity to gain practical experience. During this period of clinical experience the student is expected to develop the knowledge to assist in proton therapy treatment and mold room procedures. Specific clinical objectives are noted below.

RESP 101 Assessment and Caring for a Respiratory Patient

6 Credits

Prerequisites: Program Chair Approval. Presents an introduction into respiratory care including evaluating data in a patient's record and recommending laboratory tests. Includes the process of interviewing and assessing the patient through inspection, palpation, percussion, and auscultation. Covers performing and evaluating a patient non-invasively. Includes topics on oxygen therapy, oxygen analyzers, use of specialty gases, humidity therapy, bland aerosol, medicated aerosol delivery devices and environmental therapy. Basic lung expansion therapy, airway management, including a variety of airway clearance techniques will be covered. Students will be presented information regarding infection control, how to provide care during cardiopulmonary resuscitation and obstructed/lost airway. Assembly and troubleshooting respiratory equipment will be required.

RESP 102 Advanced Assessment and Care of a Cardiopulmonary Patient

3 Credits

Prerequisites: RESP 101. Presents respiratory pharmacology, applying concepts to the nervous system and its receptors. Students will be taught pulmonary function testing screening techniques, pulmonary mechanics, 12-Lead EKGs, advanced lung expansion techniques, and bronchial hygiene therapies. An introduction to non-invasive ventilation (NPPV), oxygenation (CPAP) and beside capnography will also be done. Students will perform tracheostomy care and arterial blood gas collection. Assembly and troubleshooting respiratory equipment will be required.

RESP 103 Cardiopulmonary Anatomy and Physiology

3 Credits

Prerequisites: APHY 102. Presents the cardiopulmonary system including ventilation, perfusion, and gas exchange; introduces interpretation and application of arterial blood gases, acid-base regulation, hemodynamics and aging. Reviews the basic principles of physics as it relates to the respiratory system.

RESP 104 Concepts in Adult Critical Care

3 Credits

Prerequisites: RESP 101, RESP 103. Introduces how to care for a critically ill adult patient. Provides concepts of using various artificial airways, mechanically ventilating and improving a critically ill patient's oxygenation and ventilation status. Student will be presented with methods and concepts for monitoring and management of a critically ill patient including recommending and evaluating lab data and blood gas analysis. Recognizes when to liberate a patient from ventilator support. Discusses and demonstrates establishing an artificial airway, airway maintenance and treatment of respiratory care emergencies such as lost airway and pneumothorax. Assembly and troubleshooting respiratory care equipment is required.

RESP 105 Cardiopulmonary Pathophysiology

3 Credits

Prerequisites: RESP 103. This course introduces etiology, symptomatology, diagnosis, therapeutics, diagnosis and prognosis of selected pulmonary diseases. Students will be expected to identify pertinent information from a patient's record and apply assessment techniques as it relates to various disease processes.

RESP 106 Cardiopulmonary Pharmacology

3 Credits

Prerequisites: Program Chair Approval. The most common pharmacological agents currently being administered are discussed according to all body systems and in relations to the nervous system and its receptors. Emphasis is placed on classifications, indications, side effects, dosages, and routes of administration. Medication discussion to include, but not limited to respiratory, cardiovascular, emergency drugs, anti-infective, diuretics and sedation agents.

RESP 107 Clinical Applications of Assessment and Caring for a Respiratory Patient

2 Credits

Prerequisites: Current CPR AHA Course C or equivalent, RESP 101, completed health forms, completed required pre-clinical documents. Introduces the student to the hospital environment and exposed them to various hospitals, respiratory care departments, patient charts, patient identification and communication within the hospital. Provides supervised experience in patient assessment techniques. Students will be expected to perform oxygen therapy, basic lung expansion therapy, humidity/aerosol therapy, medicated aerosol, inspiratory muscle training/cough techniques, and charting in the hospital setting. Assembly and troubleshooting respiratory equipment is expected. Utilizes standard precautions and infectious disease protocols during patient care and handles bio hazardous materials appropriately.

RESP 108 Clinical Applications in Advanced Assessment and Care of a Cardiopulmonary Patient

2 Credits

Prerequisites: RESP 101, RESP 103, RESP 107. Corequisite: RESP 102. Provides supervised experience in selected cardiopulmonary procedures and advanced patient assessment techniques. Students will perform electrocardiograms, capnography, airway clearance and various hyperinflation techniques (PAP), noninvasive ventilation and performing arterial blood gas punctures. Students will participate in the development of respiratory care plans, intra hospital patient transports, and rapid response teams to improve patient care. Assembly and troubleshooting respiratory equipment is required. Students may have observation rotations in critical care areas. Continuing certification in CPR is required.

RESP 118 Respiratory Therapy in Ambulatory Care

3 Credits

Prerequisites: APHY 102, HLHS 101, MEAS 218 and MEAS Program Chair Approval. Prepares students who are planning to work in ambulatory care as medical assistants to aid patients with respiratory disease. The course will provide learning and instruction in the use of oxygen; aerosolized medication therapy; respiratory system assessment; respiratory diseases; patient preparation for diagnostic exams; and prepare the student to coordinate care with home care providers for patients with respiratory disease.

RESP 121 Introduction to Respiratory Care

6 Credits

Prerequisites: Program Chair Approval. Presents an introduction into respiratory care including a brief history of the profession; equipment cleaning and sterilization techniques; patient assessment techniques to include assessing pain levels, evaluating levels of dyspnea, advanced directives and isolation techniques. Also includes medical records documentation, gas analyzers, introduction and application of therapeutic modalities including oxygen therapy, aerosol and humidity therapy, environmental therapy, lung expansion therapy, airway management to include tube placement, tracheostomy care and tracheobronchial aspiration. An overview of ethical practice and patient safety are included.

RESP 122 Therapeutic Modalities

3 Credits

Prerequisite: RESP 121. Presents medicinal aerosol therapy and respiratory pharmacology and applying it to the nervous system and its receptors. In addition, bronchial hygiene therapies, basic bedside pulmonary function testing, tracheostomy tube changes and 12-Lead EKGs will be discussed and demonstrated.

RESP 123 Cardiopulmonary Physiology

3 Credits

Prerequisites: APHY 102. Presents the cardiopulmonary system including ventilation, perfusion, and gas exchange; introduces interpretation and application of arterial blood gases, acid-base regulation, and physiologic monitoring. Reviews the basic principles of physics as it relates to the respiratory system.

RESP 125 Critical Care I

3 Credits

Prerequisites: RESP 121 and RESP 123. Presents an introduction to the respiratory care of the critically ill patient. This includes arterial blood gas collection; analysis and interpretation; and basic medical laboratory data. Introduces concepts and techniques of critical respiratory care of adults, to include establishment and maintenance of artificial airways. Includes application of adult mechanical ventilators and related cardio-pulmonary monitoring equipment.

RESP 126 Clinical Medicine I

3 Credits

Prerequisites: RESP 123. This particular course introduces etiology, symptomatology, diagnosis, therapeutics, and prognosis of selected pulmonary diseases.

RESP 129 Respiratory Care Pharmacology

3 Credits

Prerequisites: Program Chair Approval. The most common pharmacological agents currently being administered are discussed according to all body systems and in relation to the nervous system and its receptors. Emphasis is placed on classifications, indications, side effects, dosages, and routes of administration. Medication discussion to include, but not limited to emergency drugs, antibacterial medication and anti-fungal medications.

RESP 134 Clinical Applications I

2 Credits

Prerequisites: Current CPR AHA Course C or equivalent and RESP 121. Completed health forms. Completed required pre-clinical documentation. Introduces the student to the hospital environment. The student will be exposed to various hospitals and respiratory care departments, patient charts, patient identification and communication within the hospital. Provides supervised experience in oxygen therapy, lung expansion therapy, humidity/aerosol therapy, inspiratory muscle training/cough techniques, and charting. Utilizes standard precautions and infections disease protocols during patient care and handles biohazardous materials appropriately.

RESP 137 Clinical Applications II

2 Credits

Prerequisites: RESP 122, RESP 123, RESP 134. Corequisites: RESP 122. Provides supervised experience in selected therapeutic modalities. Students will perform lung expansion techniques. Additionally students will be exposed to various bronchial therapies and cough techniques. Administration of pharmacological agents using various aerosol devices will be included. Students will participate in the development of respiratory care plans, intra hospital patient transports, and rapid response teams to improve patient care. Students may have observation rotations in critical care areas. Continuing certification in CPR is required.

RESP 201 Advanced Concepts in Cardiopulmonary Diagnostic Procedures

4 Credits

Prerequisites: RESP 104 and RESP 105. Presents in-depth approaches to advanced diagnostic procedures. Special emphasis is placed on techniques of patient evaluation, selection of equipment, how to perform various diagnostic procedures, cardiopulmonary monitoring during the procedure, interpreting test results and suggesting management of the patient. Information regarding quality control, quality assurance and calibration of equipment will also be discussed. Advanced techniques of patient assessment through pulmonary function testing and other selected assessment techniques will also be covered.

RESP 202 Pediatric and Neonatal Advanced Critical Care **3 Credits**

Prerequisites: RESP 104. Presents advanced techniques of mechanical ventilation of neonatal and pediatric patients; includes fetal development and assessment; neonatal and pediatric assessment, equipment, procedures and therapeutic techniques, introduces related aspects of the neonatal intensive care unit environment. Selected neonatal and pediatric diseases and advanced modes of ventilation will be discussed.

RESP 203 Advanced Emergency Management **1 Credits**

Prerequisites: Current CPR AHA Course C or equivalent. Application of various techniques in advanced cardiopulmonary support during life threatening events. At the end of the course, students will be expected to successfully apply knowledge in a mock adult patient care setting

RESP 204 Extended Care for the Cardiopulmonary Patient **2 Credits**

Prerequisites: RESP 104. Provides an overview of respiratory care roles in home care, alternative care sites and pulmonary rehabilitation programs. Understand the purpose and function of various respiratory equipment used in home and alternative care settings. Emphasis is placed on the importance of assessing patients' learning needs and how to effectively educate a patient and/or family member concerning smoking cessation and health management. Presents an overview of emergency preparedness in relation to disaster management to include vaccination protocols. Provide overview of mass casualty incident response.

RESP 205 Advanced Respiratory Care and Comprehensive Review **3 Credits**

Prerequisites: RESP 105, RESP 201. Applies concepts taught throughout the program to be used on their national board credentialing examinations (Therapist Multiple Choice and Clinical Simulation). Additional selected diseases will be discussed in regards to etiology, symptomatology, diagnosis, therapeutics, and prognosis of disease conditions related to respiratory care.

RESP 206 Clinical Applications and Concepts in Critical Care I **2 Credits**

Prerequisites: Maintain required clinical documents, RESP 104, RESP 108. Provides supervised experience in critical care intensive care units. Advanced patient assessment, including pulmonary mechanics, interpretation of laboratory data and radiography results will be covered. Student will be expected to initiate, maintain and manage an artificial airway, support a critically ill patient's oxygenation and ventilation status to include initiating and modifying noninvasive positive airway pressures. Utilizes disease protocols and evidence based medicine to modify respiratory care plans. Assists physician in selected procedures. Continued Certification in CPR is required.

RESP 207 Clinical Applications and Concepts in Critical Care II **3 Credits**

Prerequisites: Maintain required clinical documents, RESP 206. Provides supervised experience in critical care intensive care units. Advanced patient assessment, including pulmonary mechanics, interpretation of laboratory data and radiography results will be covered. Student will be expected to initiate, maintain and manage an artificial airway, support a critically ill patient's oxygenation and ventilation status to include initiating and modifying ventilator settings. Utilizes disease protocols and evidence based medicine to modify respiratory care plans. Assemble, troubleshoot and perform QC on various hemoximetry and mechanical ventilators. Assists physician in selected procedures. Continued Certification in CPR is required.

RESP 208 Clinical Applications and Concepts in Critical Care III **5 Credits**

Prerequisites: Maintain required clinical documents, RESP 104, RESP 108. Provides supervised experience in critical care intensive care units. Advanced patient assessment, including pulmonary mechanics, interpretation of laboratory data and radiography results will be covered. Student will be expected to initiate, maintain and manage an artificial airway, support a critically ill patient's oxygenation and ventilation status to include initiating and modifying ventilator settings. Utilizes disease protocols and evidence based medicine to modify respiratory care plans. Assemble, troubleshoot and perform QC on various hemoximetry and mechanical ventilators. Assists physician in selected procedures. Continued Certification in CPR is required.

RESP 209 Advanced Clinical Applications in Critical Care and Specialty Rotations **3 Credits**

Prerequisites: Maintain required clinical documents, RESP 206 and RESP 207, or RESP 208. Provides additional supervised experience in selected therapeutic modalities during adult, pediatric and neonatal intensive care unit rotations. Also includes exposure to advanced cardiopulmonary diagnostic techniques, application of invasive and non-invasive monitoring of the cardiopulmonary system, and quality control. Students will also be exposed to patient care in extended care sites and specialty areas to include patient and family education. Completion of patient care plans and/or written case study will also be performed utilizing principles from evidence based medicine. Continuing certification in CPR is required.

RESP 218 Clinical Applications in Critical Care **5 Credits**

Prerequisites: RESP 125 and RESP 137. Maintain required clinical document. Provides supervised experience in adult critical care intensive care unit. Students will review data, assess patients, initiate and modify airway maintenance, perform arterial blood gas procedures/analysis and assist with managing mechanical ventilated patients. Additional exposure includes utilizing disease specific ventilator protocols, infection disease protocols and quality control procedures. Allow students to participate in intra-hospital transfers along with land/air transports. Continued Certification in CPR is required.

RESP 219 Clinical Applications in Critical Care I

2 Credits

Prerequisites: RESP 125 and RESP 137. Maintain required clinical document. Provides supervised experience in critical care units. Students will review data, assess patients, initiate and modify airway maintenance, perform arterial blood gas procedures/analysis and assist with managing mechanical ventilated patients. Additional exposure includes utilizing disease specific ventilator protocols, infection disease protocols and quality control procedures. Allow students to participate in intra-hospital transfers along with land/air transports. Continued certification in CPR is required.

RESP 220 Clinical Applications in Critical Care II

3 Credits

Prerequisites: RESP 219. Maintain required clinical document. Continue to provide supervised experiences in the adult critical care areas. Student will review advanced data, e.g. hemodynamic monitoring, pulmonary mechanics, cardiac monitoring, etc. Perform, interpret, and document advanced ventilator modifications and monitoring and make appropriate recommendations for modification of care. Interaction between student and physician is expected.

RESP 221 Cardiopulmonary Diagnostics

4 Credits

Prerequisites: RESP 125 and RESP 126. Presents in-depth approaches to advanced diagnostic procedures. Special emphasis is placed on techniques of patient evaluation, selection of equipment, performing procedures, cardiopulmonary monitoring during the procedure, interpreting test results and suggesting management of the patient. Also included are advanced techniques of patient assessment through pulmonary function testing and other selected assessment techniques.

RESP 222 Critical Care II

3 Credits

Prerequisites: RESP 125. Presents advanced techniques of mechanical ventilation of neonatal, pediatric and adult patients; includes fetal development and assessment; neonatal and pediatric assessment, equipment, procedures and therapeutic techniques, introduces related aspects of the neonatal intensive care unit environment. Selected neonatal and pediatric diseases will be discussed.

RESP 224 Clinical Medicine II

3 Credits

Prerequisite: RESP 126 and RESP 221. Studies etiology, symptomatology, diagnosis, therapeutics, and prognosis of disease conditions related to respiratory care; focuses on the interrelation of all physiologic systems. Emphasis on treatment protocols; includes preparation for the national board credentialing examinations such as the CRT, RRT and clinical simulation.

RESP 226 Continuing Care

2 Credits

Prerequisite: RESP 125. Provides an overview of respiratory care roles in home care, alternative care sites and pulmonary rehabilitation programs. Understand the purpose and function of various respiratory equipment used in home and alternative care settings. Emphasis is placed on the importance of assessing patients' learning needs and how to effectively educate a patient and/or family member concerning smoking cessation and health management. Presents an overview of emergency preparedness in relation to disaster management to include vaccination protocols. Provide overview of mass casualty incident response.

RESP 229 Emergency Management

1 Credit

Prerequisites: Current CPR AHA Course C or equivalent. Application of various techniques in advanced cardiopulmonary support during life threatening events. At the end of the course, students will be expected to successfully apply knowledge in a mock adult patient care setting.

RESP 237 Clinical Applications of Advanced Critical Care and Specialty Rotations

3 Credits

Prerequisites: RESP 218 or RESP 219 and RESP 220. Maintain required clinical document. Provides additional supervised experience in selected therapeutic modalities during adult, pediatric and neonatal intensive care unit rotations. Also includes exposure to advanced cardiopulmonary diagnostic techniques, application of invasive and non-invasive monitoring of the cardiopulmonary system, and quality control. Students will also be exposed to patient care in alternative care sites and specialty areas. Completion of patient care plans and/or written case study will also be performed. Continuing certification in CPR is required.

RESP 250 Beginning Polysomnography

2 Credits

Prerequisites: Program Advisor Approval. An overview of the field of Polysomnography including history, job responsibilities, credentialing, medical ethics and patient confidentiality. Normal and abnormal sleep disorders, integrating the physiologic functions of the nervous, respiratory and cardiovascular systems. Emphasis on basic sleep sciences, physiology, monitoring, electrical safety, diagnosis and treatment of sleep disorders.

RESP 251 Intermediate Polysomnography I

3 Credits

Prerequisites: APHY 102 and RESP 250 or Program Advisor Approval. Basic discussions of recording sleep apnea montage. Emphasis on equipment, principles of operation, associated activity related to normal and abnormal stages of sleep, placement and calibration of the following: electroencephalography (EEG), electroculography (EOG), electrocardiography (ECG), electromyography (EMG), pulse oximetry (SpO₂), inductive plethysmography and airflow thermocouple.

RESP 252 Polysomnography Directed Practice I

3 Credits

Prerequisites: APHY 102 and RESP 250 or Program Advisor Approval. Directed practice in clinical setting in sleep laboratory or center. Departmental orientation, policies and procedures, individual body mechanics and patient transfer techniques. Emphasis in overseeing periodic cessation of respiratory activity based on the placement and monitoring of electroencephalography (EEG), electroculography (EOG), electrocardiography (ECG), electromyography (EMG), pulse oximetry (SpO₂), inductive plethysmography, airflow thermocouple.

RESP 253 Neurophysiology of Sleep

2 Credits

Prerequisites: RESP 251 and RESP 252 or Program Advisor Approval. Presentation and discussion of the chemical and neural control of the onset of sleep and wakefulness; normal function and pathophysiology; current theory and research applications.

RESP 254 Intermediate Polysomnography II

3 Credits

Prerequisites: RESP 251 and RESP 252 or Program Advisor Approval. Presentation and discussion of the psychomotor practices related to interpretation of the polysomnogram for adult and pediatric patients. Emphasis on continuous positive airway pressure (CPAP) and bi-level positive airway pressures (BiPAP) equipment; artifact recognition and troubleshooting of sleep montage results. Includes digital data acquisition and parasomnias.

RESP 255 Polysomnography Directed Practice II

3 Credits

Prerequisites: RESP 252 or Program Advisor Approval. Directed practice in the clinical setting in sleep laboratory or a sleep center. Departmental orientation, policies and procedures; assist adult and pediatric patient set-up and discontinuance in monitoring of the following: electroencephalography (EEG), electroculography (EOG), electrocardiography (ECG), electromyography (EMG), pulse oximetry (SpO₂), inductive plethysmography and airflow thermocouple. Emphasis on scoring a sleep montage.

SCIN 100 Earth Science

TransferIN 4 Credits

Prerequisites: MATH 123 or MATH 122 or demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023, ENGL 093 and ENGL 083 or ENGL 095. Introduces physical concepts and theories pertaining to current applications and trends in earth science. Basic concepts in geology, meteorology, oceanography, and astronomy will be illustrated. Includes lab.

SCIN 101 Science of Traditional and Alternative Energy

4 Credits

Prerequisites: MATH 122 Technical Mathematics or MATH 123 Quantitative Reasoning or demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 035 Fundamentals of Algebra II or MATH 043 Essentials of Algebra II and ENGL 093 Introduction to College Writing and ENGL 083 Reading Strategies for College or ENGL 095 Integrated Reading and Writing. Introduces the basic physical concepts in understanding the science of different forms of energy- potential, kinetic, thermal, electrical, and light. Selected aspects of common sources of sustainable energy, including solar, wind, water, geothermal, and biomass will also be illustrated. Consideration of the science of transportation or storage of energy using new methods that reduce environmental impact will be discussed. Includes lab.

SCIN 111 Physical Science

TransferIN 3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. Introduces physical concepts and theories pertaining to current applications and trends in physics. Basic concepts in chemistry, earth science and astronomy will also be illustrated. Emphasizes concepts and applications. Includes lab.

SDEV 120 Computing Logic

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 or ENGL 095, MATH 080 or MATH 100. Introduces the student to algorithms, logic development and flowcharting as tools used to document computer logic. Students will study math concepts and the importance to computer development. Included areas of study are base numbering systems, truth tables, logic and relational operators. Other concepts covered are order of precedence, decision trees, security, different types of language approaches, and scripting. Students will practice skills such as listening, team building, work ethic, communications, documentation, and adaptability. Concepts will be demonstrated using basic scripting and simple programming code.

SDEV 140 Introduction to Software Development

3 Credits

Prerequisites: SDEV 120 and demonstrated competency through appropriate assessment or a grade of "C" or better in MATH 100 or MATH 123 or MATH 135. Corequisites: SDEV 120. Introduces students to concepts and practices of programming languages and software development. Students are introduced to algorithms and development tools used to document/implement computer logic. Discusses the history of software development, the different types of programming such as real time processing, web/database applications, and different program development environments. Students are introduced to structured programming concepts such as basic control structures, variables, constants, arrays, procedures and functions; and advanced concepts such as lists, records, sorts and searches. Students are introduced to object-oriented software development. Concepts will be applied using different programming languages, and students will develop and test working programs in an integrated system. Students will practice skills such as team building, work ethic, communication, documentation, and adaptability.

SDEV 153 Web Site Development

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 083 and ENGL 093 or ENGL 095 and INFM 109 or CSCI 101. Corequisites: INFM 109 or CSCI 101. Provides a basic understanding of the essential Web development skills and business practices that directly relate to Internet technologies used in Web site development. Students will learn to develop Web sites using Hypertext Markup Language (HTML) and Cascading Style Sheets (CSS). Students will work with images, hyperlinks, tables, forms, and multimedia for Web pages

SDEV 181-194 Special Topics in Software Development

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in introductory software development with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

SDEV 200 Software Development Using Java

3 Credits

Prerequisites: SDEV 140 or CSCI 101. Provides a basic understanding of the fundamental concepts involved when using the Java programming development language. The emphasis is on logical program design using a modular approach involving task-oriented program functions. Object-oriented concepts such as methods, attributes, inheritance, exception handling, and polymorphism are utilized. Applications are developed using these concepts and include developing a graphical user interface, selecting forms and controls, assigning properties and writing code. Students are required to demonstrate course objectives through the appropriate Oracle Java certification exam and the fee for the exam is assessed upon enrollment in the course.

SDEV 210 Software Development Using Visual Basic in the .NET Framework

3 Credits

Prerequisites: SDEV 140 or CSCI 101. Provides a basic understanding of the fundamental concepts involved when using a member of a Windows programming development language. The emphasis is on logical program design using a modular approach involving task oriented program functions. Visual Basic applications are built by selecting forms and controls, assigning properties, and writing code. Emphasis is also placed on data file design, data handling, database access, menus, and variable arrays. Students will use advanced features to increase their level of proficiency in developing Visual Basic applications, using the .NET framework to create projects with multiple programming sources, and interactivity with databases and web pages.

SDEV 220 Software Development Using Python

3 Credits

Prerequisites: SDEV 140 or CSCI 101. Provides an understanding of fundamental and advanced concepts of the Python programming language. The emphasis will be on creating industry standard programs using current programming design software. Students will learn basic programming concepts such as sequence, iteration and decision structures; variables and constants; and functions and advanced concepts such as searches, sorts, collections, dictionaries, arrays, and linked lists. Students will learn the concepts of object-oriented programming using classes, inheritance and polymorphism. These skills will be practiced in a hands-on environment. Students will practice skills such as team building, work ethic, communication, documentation, and adaptability.

SDEV 230 Software Development Using C++

3 Credits

Prerequisites: SDEV 140 or CSCI 101. Covers topics in C++ programming language with emphasis on classes, advanced debugging techniques, pointers, dynamic memory allocation, and data allocation. Students will apply skills in a laboratory environment. Students will be introduced to object-oriented design and programming concepts using C++ language features. Differences between C and C++ programming will be discussed.

SDEV 240 Software Development Using C#

3 Credits

Prerequisites: SDEV 140 or CSCI 101. Provides an understanding of fundamental and advanced concepts of the C# programming language. The emphasis will be on creating industry standard programs using current programming design software. Students will learn basic programming concepts such as sequence, iteration and decision structures; variables and constants; and functions and advanced concepts such as searches, sorts, collections, dictionaries, arrays, and linked lists. Classes, inheritance, polymorphism, connecting to databases, and multiform projects will also be utilized. Students will apply these skills in a hands-on environment. Students will practice skills such as team building, work ethic, communications, documentation, and adaptability.

SDEV 245 Security and Secure Coding

3 Credits

Prerequisites/Corequisites: SDEV 200 or SDEV 210 or SDEV 220 or SDEV 230 or SDEV 240 or CSCI 102 or CSCI 201 and MATH 136. The course introduces the secure software development process including designing secure applications, writing secure code designed to withstand various types of attacks, and security testing and auditing. It focuses on the security issues a developer faces, common security vulnerabilities and flaws, and security threats. The course explains security principles, strategies, coding techniques, and tools that can help make software fault tolerant and resistant to attacks. Students will write and analyze code that demonstrates specific security development techniques. Students will also learn about cryptography as an indispensable resource for implementing security in real-world applications. Students will learn foundations of cryptography using simple mathematical probability. Information theory, computational complexity, number theory, and algebraic approaches will be covered.

SDEV 250 Client-Side Scripting Languages and Tools

3 Credits

Prerequisites: SDEV 153. Students will learn basic to intermediate client-side scripting aspects including the use of JavaScript and other tools as related to web page development. Students will prepare client-side scripts using data types and variables, expressions and operators, functions, arrays and objects. Students will use these to interact with HTML components to create dynamic web content. Students will use scripts interacting with HTML forms, how to create, manipulate and save client-side cookies. Builds on the Web Site Development course, emphasizing the basics of client-side scripting and asynchronous Web communication serving as a natural complement to the Server-Side Scripting Languages and Tools course.

SDEV 253 Server-Side Scripting Languages and Tools

3 Credits

Prerequisites: SDEV 153 and DBMS 110. Students will learn basic to intermediate server-side scripting aspects including the use of PHP: hypertext preprocessor and other scripting tools. Students will prepare server-side scripts that work hand-in-hand with front-end Web languages such as Hyper Text Markup Language and JavaScript. Server-side scripts will be used to create dynamic web interfaces. Builds on the Web Development course, emphasizing server-side scripting with database integration and serves as a natural complement to the Client-Side Scripting Languages and Tools course.

SDEV 264 Mobile Application Development

3 Credits

Prerequisites/Corequisites: SDEV 200 or SDEV 210 or SDEV 220 or SDEV 230 or SDEV 240. Introduces students to concepts and practices of different programming and software development languages for mobile applications. Students will learn the software development lifecycle for mobile devices including investigating requirements, feasibility, building, testing, deploying, and supporting the application. Concepts will be applied through creating hands-on applications for one or more platforms using current development environments and tools. Students will practice skills such as team building, work ethic, communication, documentation, and adaptability.

SDEV 265 Software Development Projects

3 Credits

Prerequisites: SDEV 200 or SDEV 210 or SDEV 220 or SDEV 230 or SDEV 240 or CSCI 102 or CSCI 201. Students will explore and learn about the fundamental parts of the systems development process, from analysis through design, implementation, and maintenance. Students will then develop a software product for an actual or simulated client who intends to use the product in a business environment. Students will form project teams to work through the full software development life cycle from understanding the business requirements to delivering a functioning product. Students will explore software development issues, select the appropriate development life cycle, estimate effort and development times, understand risk management, and write functional software. Students will make a series of presentations and reports of the project progress to the client and instructor. Students will learn methodologies pertinent to the assessment, design, and implementation of information systems.

SDEV270 Workforce Preparation: Microsoft Software Development Fundamentals MTA Certification

1 Credits

Prerequisites: DBMS 110 Database Design and Management and SDEV 153 Web Site Development and (SDEV 200 Software Development using Java or SDEV 210 Software Development using Visual Basic or SDEV 220 Software Development using Python or SDEV 230 Software Development using C++ or SDEV 240 Software Development using C#). The workforce preparation course is focused on the Microsoft Software Development Fundamentals certification. Students can use this course as preparation leading to the certification, for keeping the certification up to date, or as review as they work forward into further Microsoft or other software development or programming certifications. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SDEV 271 Workforce Preparation: Java Foundations Certification

1 Credits

Prerequisites/Corequisites: SDEV 200. The workforce preparation course is focused on the Oracle Java Foundations exam, number 1Z0-811. Students use this course as preparation leading to taking the Java Foundations Certified Junior Associate certification. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exams. Students are required to demonstrate course objectives through the appropriate certification exams preparation materials and completion of the appropriate certification exams at the end of the course. The fee for the certification exams are assessed upon enrollment in the course.

SDEV 273 Workforce Preparation: C++ Institute – C++ Certified Associate Programmer Certification

1 Credits

Prerequisites/Corequisites: SDEV 230 or CSCI 102. The workforce preparation course is focused on the C++ Institute's Certified Programmer Associate certification. Students use this course as preparation leading to the certification, for keeping the certification up to date, or as review as they work forward into further C++ Institute or other software development, computer science, or programming certifications. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes quizzes, assignments, and practice tests based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SDEV 274 Workforce Preparation: Microsoft 70-483 Programming in C# Jump Start Certification **1 Credit**

Prerequisites/Corequisites: SDEV 240. The workforce preparation course is focused on the Microsoft Programming in C# Jump Start certification. Students use this course as preparation leading to the taking the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SDEV 275 Workforce Preparation: MTA 98-375 HTML5 Fundamentals Certification **1 Credits**

Prerequisites/Corequisites: SDEV 153. The workforce preparation course is focused on the Microsoft MTA 98-375 HTML5 Fundamentals Certification. Students use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SDEV 276 Workforce Preparation: Android Certified Developer **1 Credits**

Prerequisites/Corequisites: SDEV 264. The workforce preparation course is focused on the ATC Android Certified Developer certification. Students use this course as preparation leading to the certification, for keeping the certification up to date, or as review as they work forward into further Android ATC or other software development or programming certifications. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SDEV 281-294 Advanced Special Topics in Software Development **1-3 Credits**

Prerequisites: Program Advisor Approval. Discusses topics of current interest in software development with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

SOCI 111 Introduction to Sociology **TransferIN 3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Introduces students to the major theoretical paradigms of the science of human society, including fundamental concepts, descriptions, and analyses of society, culture, socialization processes, social institutions, social change, social stratification and the application of this understanding to everyday living. ***Students who apply to and are admitted in to the American Honors at Ivy Tech Program, may be able to enroll in the honors section of this course. Please talk with an advisor or visit www.ivytech.edu/honors for additional information.***

SOCI 164 Multicultural Studies **3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Introduces students to the historical experiences, values, cultures, and beliefs of the major racial and ethnic groups that make up the population of the United States. Examines central questions in the theoretical and empirical study of race and ethnicity. This course will help prepare students to understand, appreciate, and work effectively with people who are different from themselves.

SOCI 211 Introduction to Research Methods in Sociology **3 Credits**

Prerequisites: SOCI 111 and Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or MATH 080. This course will familiarize students with the basic concepts, techniques, and problems associated with conducting research in sociology. Students will be provided with the analytical and critical thinking skills required to design, conduct, and interpret empirical research. Problems specific to research in sociology will be explored.

SOCI 245 Cultural Diversity **3 Credits**

Prerequisites: SOCI 111 and ENGL 111. Surveys multiple dimensions of diversity and social stratification in the United States, including race, ethnicity, age, class, physical ability, religion, gender, and sexuality. The social impact of the cultural integration of these groups will be introduced.

SOCI 252 Social Problems **TransferIN 3 Credits**

Prerequisites: SOCI 111. Explores various problems in contemporary American society. Examines structural and cultural aspects of social problems with specific reference to their origin, development, and suggested solutions. Course utilizes a sociological framework which encompasses a variety of theoretical perspectives.

SOCI 253 Introduction to Social Psychology **3 Credits**

Prerequisites: PSYC 101 or SOCI 111. The study of social psychology as a science, and how social psychologists study the interactions within and between individuals, social groups and institutions. This course crosslists with PSYC 253.

SOCI 261 Sociology of Relationships and the Family **3 Credits**

Prerequisites: SOCI 111. Examines the sociological and psychological dynamics of dating, relationships, marriage, family life and parenting. Introduces students to the major theoretical paradigms as they relate to relationships. Emphasis will be placed on how our contemporary society and culture is affecting these institutions and customs. The course will also explore the impact of divorce and stepfamilies on today's lifestyles.

SPAN 101 Spanish Level I

TransferIN 4 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. An introductory course in Spanish. Focuses on developing students' capacity to use the language and to appreciate Spanish-speaking cultures. Emphasis is placed on skills of listening, speaking, reading, writing, and grammar acquisition.

SPAN 102 Spanish Level II

TransferIN 4 Credits

Prerequisites: SPAN 101 Spanish Level I or demonstrated competency in Spanish through appropriate assessment; demonstrated competency in reading and writing through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Continues the study of Spanish for students who have had the equivalent of one semester of college-level Spanish. Introduces additional grammatical structures and vocabulary to further develop speaking, reading, writing and listening skills as well as an appreciation of the cultures of the Spanish-speaking world.

SPAN 201 Spanish Level III

TransferIN 3 Credits

Prerequisites: SPAN 102 or demonstrated competency in Spanish through appropriate assessment; demonstrated competency in reading and writing through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Spanish is the primary medium of instruction. The goal of the course is to continue the development and reinforcement of the skills of the target language: listening, speaking, reading and writing at an intermediate level. The course continues the study of grammar/syntax, vocabulary building, and Spanish and Latin American civilizations, cultures, and literature through discussion and written and oral reports.

SPAN 202 Spanish Level IV

TransferIN 3 Credits

Prerequisites: SPAN 201 or demonstrated competency in Spanish through appropriate assessment; demonstrated competency in reading and writing through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Spanish is the primary medium of instruction. The goal of the course is to continue the development and reinforcement of the skills of the target language: listening, speaking, reading and writing at an advanced intermediate level. The course continues the study of grammar/syntax and vocabulary building and continues the study of Spanish and Latin American civilizations through readings, both journalistic and literary, and reinforced through class discussions as well as written and oral reports.

SPAN 202AH Spanish Level IV (American Honors)

3 Credits

Prerequisites: SPAN 201 Spanish Level III or demonstrated competency in Spanish through appropriate assessment and admission into the American Honors at Ivy Tech Program. Spanish is the primary medium of instruction. The goal of the course is to continue the development and reinforcement of the skills of the target language: listening, speaking, reading and writing at an advanced intermediate level. The course continues the study of grammar/syntax and vocabulary building and continues the study of Spanish and Latin American civilizations through readings, both journalistic and literary, and reinforced through class discussions as well as written and oral reports.

SPAN 240 Introduction to the Literature of the Spanish-Speaking World

3 Credits

Prerequisites: SPAN 202 or demonstrated competency in Spanish through appropriate assessment; demonstrated competency in reading and writing through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. An introduction to the literary analysis of Hispanic literature. Provides a general overview of representative works of Hispanic literature from the Middle Ages through the Twentieth Century. Students will read and analyze works of poetry, prose, and theatre within the texts' cultural and historical contexts using the fundamental concepts of literary analysis to guide the interpretation.

SPED 210 Collaborative Relationships in Special Education

3 Credits

Prerequisites: EDUC 121. Corequisites: EDUC 230. This course prepares students to understand the importance of developing collaborative relationships with families, other school personnel, and outside agency service providers who support students with mild exceptional needs. The student will develop and demonstrate dispositions and skills for building these essential professional relationships for the benefit of individual students. They will also plan transition strategies for students with mild exceptional needs, in conjunction with families and community agencies. Ten hours of field experience will be required in this course.

SPED 230 Informal and Formal Assessments for Mild Disabilities

3 Credits

Prerequisites: EDUC 230. This course is designed to familiarize students with general knowledge and skills related to assessment terminology, measurement theory, formal and informal assessment practices as well as strategies for administering and interpreting assessments. Information is also discussed regarding Universal Design for Learning, IEP construction and interpretation, and using assessment results to develop appropriate interventions and consult with families and stakeholders.

SPED 240 Culturally Appropriate Practices for Managing Behaviors

3 Credits

Prerequisites: EDUC 230, SPED 210. This course initially focuses on the physical classroom environment and how to maximize the learning opportunity for all children within the school environment. It then seeks to enhance the student's understanding of successful disciplinary techniques needed to work with diverse populations. This course includes an intense study of behavior management for students with exceptional needs. Emphasis is on applied behavior analysis, record keeping of student performance data, task analysis, writing behavior plan, and ethical issues in behavior modification. A field experience of 20 hours is required with this course.

SURG 111 Fundamentals of Surgical Technology **4 Credits**

Prerequisites: Admission to Surgical Technology Program, Corequisite: SURG 112. Introduces principles of sterile techniques and the operative care of the surgical patient. Includes the roles of surgical hand antisepsis and circulating duties.

SURG 112 Application of Surgical Fundamentals **2 Credits**

Prerequisites: Admission to Surgical Technology Program. Corequisites: SURG 111. Demonstrates the application of surgical fundamentals. Correlates theory to practice by requiring students to participate as members of a surgical team in laboratory simulations.

SURG 113 Surgical Procedures I **3 Credits**

Prerequisites: SURG 111, SURG 112. Corequisites: SURG 114. Introduces general surgical procedures with review of perioperative patient care including diagnostic testing, preoperative care, and immediate post-operative care.

SURG 114 Clinical Applications I **3 Credits**

Prerequisites: SURG 111, SURG 112. Corequisites: SURG 113. Correlates principles and theories of basic surgical procedures to clinical performance in affiliating hospitals. Includes knowledge, skills and professionalism necessary for implementation of safe patient care in an operating room.

SURG 203 Surgical Pharmacology **3 Credits**

Prerequisites: APHY101 and HLHS 101 demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023 or MATH 080. Introduces the basic concepts of pharmacology. Emphasis is given to classification, indications, interactions and adverse reactions of commonly used medications. Dosage calculation, weights and measures, terminology and abbreviations associated with drug use are presented. Medication use in the perioperative patient is addressed.

SURG 211 Surgical Procedures II **6 Credits**

Prerequisites: SURG 113 and SURG 114. Corequisites: SURG 212. Studies specialized surgical procedures in relation to the physiological aspects of surgical intervention including those procedures related to the special senses, genitourinary, reproductive, musculoskeletal, and nervous systems. Includes knowledge of the involved anatomy, existing pathology, surgical hazards encountered, the surgical procedure, and a review of perioperative patient care.

SURG 212 Clinical Applications II **9 Credits**

Prerequisites: SURG 113 and SURG 114. Corequisites: SURG 211. Correlates the basic principles and theories of specialized surgical procedures to clinical performance in affiliating hospitals. Includes knowledge, skills and professionalism necessary for successful implementation of safe patient care in an operating room.

SURG 213 Surgical Procedures III **3 Credits**

Prerequisites: SURG 211 and SURG 212. Corequisites: SURG 214. Studies advanced surgical procedures including those related to aesthetic and reconstructive surgery, the cardiothoracic and vascular systems. Includes knowledge of the involved anatomy, existing pathology, surgical hazards encountered, the surgical procedure, and a review of perioperative patient care.

SURG 214 Clinical Applications III **7 Credits**

Prerequisites: SURG 211 and SURG 212. Corequisites: SURG 213. Correlates principles and theories of advanced surgical procedures to the clinical performance in affiliating hospitals. Includes the knowledge, skills and professionalism necessary for successful implementation of safe patient care in an operating room.

SURG 215, Introductory Perioperative Nursing **3 Credits**

Prerequisites: Current Registered Nurse License. Corequisites: None. Introduces the role of the perioperative nurse including principles of sterile techniques, surgical supplies and equipment, the surgical skin prep, basic surgical pharmacology and management of the surgical patient. Includes scrubbing and circulating duties.

SUST 100 Introduction to Renewable Energy Systems **3 Credits**

Prerequisites: None. Introduction to energy production systems from renewable sources. Course covers solar, wind, geothermal, biomass, anaerobic digestion, and other emerging sources of energy production. System factors are researched. Discussion and exercises center around renewability and sustainability.

SUST 101 Wind Power **3 Credits**

Prerequisites: None. Introduction to wind power systems. The course covers aspects of site selection, topographic map reading, meteorology, wind turbine construction, wind power system components, and wind turbine safety.

SUST 102 Solar, Wind, and Geothermal Systems **3 Credits**

Prerequisites: INDT 113 or ADMF 113. Installation and maintenance of residential and commercial scale solar power and heat, wind power, and geothermal heat systems. Components, model, and uses of available solar, wind, and geothermal systems are researched and used in the course.

SUST 111 Wind Turbine Mechanical Systems I

3 Credits

Prerequisites: None. The use and maintenance of the mechanical, hydraulic, and electrical systems found in wind turbine systems. The course will cover general wind turbine systems and operations. Troubleshooting for the mechanical, hydraulic, and electrical systems will be covered.

SUST 123 Fundamentals of Biofuel Production

3 Credits

Prerequisites: None. Introduction to feedstock's and production processes of ethanol and biodiesel. This course covers the acquisition, handling, and treatment processes of feedstock's destined for biofuel production. Laboratory exercises will include the study of the chemistry and biology used in the biodiesel and fermentation processes.

SUST 201 Bioenergy Feedstock Systems

3 Credits

Prerequisites: None. Collection, transportation, handling, and storage of bio-based feedstocks. Course will focus on energy feedstock from products such as corn stover, switchgrass, and wood-based products destined for combustion, gasification, pyrolysis, pelletization, and co-firing with coal operations.

SUST 211 Wind Turbine Mechanical Systems II

3 Credits

Prerequisites: SUST 111. The continuation of Wind Turbine Mechanical System I. This course will cover the interaction of the wind turbine systems with technologies such as [mechanical] transmission, power generation, and power transmission systems.

SUST 220 Wind Turbine Controls

3 Credits

Prerequisites: INDT 133 or ADMF 113. Introduces the theory and uses of control systems and programmable logic devices (PLD) used in wind turbines from a holistic and application point of view. The course also introduces SCADA systems.

SUST 222 Advanced Wind Turbine Safety

3 Credits

Prerequisites: SUST 101 or Program Chair Approval. Advanced topics in wind turbine safety. Course will demonstrate safety techniques through permit required confined space (PRCS), electrical safety including NFPA 70e, rope access, first aid, emergency response, and vertical rescue operation.

SVAD 111 Linux and Virtualization Technologies Fundamentals

3 Credits

Prerequisites: ITSP 135. Corequisites: ITSP 135. Designed as a dual purpose course, providing students with the necessary skills to understand and apply Linux and virtualization concepts while maintaining a clear division between subjects. Students will apply fundamental concepts with project-based content exercises. Students will have a strong understanding of critical Linux and virtual technologies. Students will demonstrate the ability to install, manage, monitor, configure, and troubleshoot the fundamental systems and services available in most major Linux operating system distributions. Further study concentrates on the file system organization service, command line language, file system, and print service permissions found in the Linux operating system. Virtualization technologies including the exploration, installation, and troubleshoot various virtualization software packages to obtain the skillset necessary to choose and implement hypervisor environments for client-level operating systems. Students are required to demonstrate course objectives through the appropriate Linux certification exam and the fee for the exam is assessed upon enrollment in the course.

SVAD 116 Linux Administration I

3 Credits

Prerequisites: SVAD 111. Linux Administration provides hands-on training for installing, managing, monitoring, configuring and troubleshooting the fundamental systems and services found in most major Linux operating system distributions. Students will learn to manage the Linux boot process, install software, and manage users and groups, the Linux files system including ownerships, permissions and quotas. Students will learn to write shell scripts and manage network services on the Linux server. Students will learn how to secure a Linux desktop and server.

SVAD 117 Workforce Preparation: CompTIA Linux+ Certification

1 Credit

Prerequisites: SVAD 116. Corequisites: SVAD 116. The workforce preparation course is focused on the CompTIA Linux+ certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SVAD 121 Enterprise Computing

3 Credits

Prerequisites: ITSP 135 and NETI 105. Corequisites: NETI 105. Provides students the ability to implement, administer, and troubleshoot information systems that incorporate the Microsoft Windows clients and servers in an enterprise environment. Students will be introduced to managing applications, files, folders, and devices in a windows active directory environment.

SVAD 124 RedHat System Administration I

3 Credits

Prerequisites: SVAD 111. Red Hat System Administration I is designed for students without previous Linux system administration experience. The course is intended to provide students with Linux administration "survival skills" by focusing on core administration tasks. Red Hat System Administration I also provides a foundation for students planning to become full-time Linux system administrators by introducing key command-line concepts and enterprise-level tools. These concepts are further developed in the follow-on course, Red Hat System Administration II.

SVAD 134 RedHat System Administration II **3 Credits**

Prerequisites: SVAD 124. This course is specifically designed for students who have completed Red Hat System Administration I. Red Hat System Administration II focuses on the key tasks needed to become a full time Linux Administrator. This course goes deeper into enterprise Linux administration including file systems and partitioning, logical volumes, SELinux, firewalling, and troubleshooting.

SVAD 181-194 Special Topics in Server Administration **1-3 Credits**

Prerequisites: Program Advisor Approval. Discusses topics of current interest in introductory server administration with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

SVAD 216 Linux Administration II **3 Credits**

Prerequisites: SVAD 116. Corequisites: SVAD 116. Provides hands-on Linux networking using planning, implementation, and administration. Continues with Linux kernel level configuration, system initialization, and boot processes. Students will learn to manage file systems, hardware, and devices. Students will configure basic Linux network settings and advanced network configuration and troubleshooting.

SVAD 217 Workforce Preparation: LPIC II-20 Certification **1 Credit**

Prerequisites: SVAD 216. Corequisites: SVAD 216. The workforce preparation course is focused on the LPIC II-201 certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SVAD 224 RedHat System Administration III **3 Credits**

Prerequisites: SVAD 134. This course is specifically designed for students who have completed Red Hat System Administration I. Red Hat System Administration II focuses on the key tasks needed to become a full time Linux Administrator. This course goes deeper into enterprise Linux administration including file systems and partitioning, logical volumes, SELinux, firewalling, and troubleshooting.

SVAD 225 Workforce Preparation: RedHat Certified Systems Administrator Certification **1 Credits**

Prerequisites/Corequisites: SVAD 134. The workforce preparation course is focused on the RedHat Certified Systems Administrator Certification. Students use this course as preparation leading to the certification, for keeping the certification up to date, or as review as they work forward into further RedHat or other server administration or systems administration certifications. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes quizzes, assignments, and practice tests based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SVAD 231 Microsoft Server Administration I **3 Credits**

Prerequisites: SVAD 121. First of a three-course sequence in which Microsoft server is used for building a server-based infrastructure in an existing enterprise environment. The student will install and configure servers in various roles. Students will configure Hyper-V; deploy and configure core network services; install and configure Active Directory; and create and manage group policy.

SVAD 232 Workforce Preparation: Microsoft 70-410 Certification **1 Credit**

Prerequisites: SVAD 231. Corequisites: SVAD 231. The workforce preparation course is focused on the Microsoft 70-410 certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SVAD 236 Microsoft Server Administration II **3 Credits**

Prerequisites: SVAD 231. Corequisites: SVAD 231. Second of a three-course sequence in which Microsoft server is used for building a server-based infrastructure in an existing enterprise environment. Students will expand on the Active Directory and group policy material introduced in the first course by configuring a network policy server infrastructure and network services.

SVAD 237 Workforce Preparation: Microsoft 70-411 Certification **1 Credit**

Prerequisites: SVAD 236. Corequisites: SVAD 236. The workforce preparation course is focused on the Microsoft 70-411 certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SVAD 241 Microsoft Server Administration III

3 Credits

Prerequisites: SVAD 231 and SVAD 236. Corequisites: SVAD 236. Third of a three-course sequence in which Microsoft server is used for building a server-based infrastructure in an existing enterprise environment. Students will continue to expand their abilities concerning Active Directory and network services. Students will implement access, availability, storage, and business continuity solutions.

SVAD 242 Workforce Preparation: Microsoft 70-412 Certification

1 Credit

Prerequisites: SVAD 241. Corequisites: SVAD 241. The workforce preparation course is focused on the Microsoft 70-412 certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SVAD 246 Microsoft Server Administration IV

3 Credit

Prerequisites: SVAD 241. Corequisite: SVAD 241. Students will learn the knowledge and skills to design, plan and implement a Microsoft server infrastructure. Students will describe and demonstrate the successful completion of a server infrastructure for Microsoft environment, the implementation of network infrastructure services for Microsoft server, and the logical/physical Active Directory Services infrastructure for the Microsoft environment. Students are required to demonstrate course objectives through the appropriate Microsoft certification exam preparation materials.

SVAD 247 Workforce Preparation: Microsoft 70-413 Certification

1 Credit

Prerequisites: SVAD 246. Corequisites: SVAD 246. The workforce preparation course is focused on the Microsoft 70-413 certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SVAD 250 Linux Administration III

3 Credits

Prerequisites: SVAD 116 and SVAD 216. Corequisite: SVAD 216. Students will manage and implement web, file, and email services in a Linux environment. Students will learn to manage network clients and network interoperability. Implementation and troubleshooting system security will be covered.

SVAD 252 Workforce Preparation: LPIC II-202 Certification

1 Credit

Prerequisites: SVAD 250. Corequisites: SVAD 250. The workforce preparation course is focused on the LPIC II-202 certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SVAD 257 Workforce Preparation: Microsoft 70-414 Certification

1 Credit

Prerequisites: SVAD 246. Corequisites: SVAD 246. The workforce preparation course is focused on the Microsoft 70-413 certification. Students can use this course as preparation leading to the certification or keeping the certification up to date. The preparation is designed to be a continued validation of one's expertise and a tool to expand one's skillset. Preparation includes practice tests and assignments based on the certification exam. Students are required to demonstrate course objectives through the appropriate certification exam preparation materials and completion of the appropriate certification exam at the end of the course. The fee for the certification exam is assessed upon enrollment in the course.

SVAD 281-294 Advanced Special Topics in Server Administration

1-3 Credits

Prerequisites: Program Advisor Approval. Discusses topics of current interest in server administration with emphasis on the application of information technology skills during lab time. Identifies and offers various special topics during each term under this course number.

TMAS 101 Holistic Approach to Wellness

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095. Considers the holistic approach to wellness with discussion including the connection of disease, the autonomic nervous system, and the emotions. Holistic Approach explores the importance of the mind-body connection and integrative health care. Teaches the role wellness plays in our own lives and the importance of massage therapy in relation to health and wellness.

TMAS 103 Human Energies

2 Credits

Prerequisites: None. This course helps the student develop an understanding of the human energy system and how this system impacts and reflects the physical, emotional, mental, and spiritual aspects of health. The techniques of several energy therapists will be taught, as well as professional practitioner/client interactions and the importance of self-care. These techniques are useful to aid relaxation, reduce pain, lessen anxiety, and accelerate wound healing, both for oneself and others.

TMAS 104 Reflexology

2 Credits

Prerequisites: APHY 101. Teaches the different aspects and points on the foot and hand relating to other areas of the body. Can be integrated into massage practice or can be an independent approach. An introduction to the musculoskeletal, cardiovascular, and nervous systems and their relationship to the zones on the feet are included. Systems disorders, including the sensory and endocrine, are also identified and discussed. The relationships of the five zones of the foot are identified as are the areas of the spine with spinal nerve innervation and intervention.

TMAS 107 Herbal Remedies

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083, or ENGL 095. Covers the common medical conditions, and the herbal remedies that are used to supplement healthcare. The most common herbal remedies will be discussed, as well as the traditional indications, dose ranges, side effects, and contraindications. The student will gain a more in depth knowledge of herbal remedies being utilized in healthcare today and know how to research more knowledge on medical conditions and herbal remedies.

TMAS 115 Ethics and Massage Management

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 023. Provides instruction in ethics and massage management. This course includes professional ethics, relationships and professional boundaries, state and federal legal matters, safety and sanitation regulations and practices, as well as liability related issues. Also financial administration, electronic health records and client documentation is discussed. Introduction to taxes and self-employment issues are also explored. Importance of personal professional development including ongoing education and research literacy in the profession is discussed.

TMAS 120 Therapeutic Massage Training I

3 Credits

Prerequisites: APHY 101 and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083 or ENGL 095 and MATH 023 or MATH 080. This course will explore in detail the history of massage, professional and legal issues of massage, sanitation, professional touch, and massage equipment and products. Coursework will include the anatomy and physiology of the body, by systems, and the effects of massage on each. Disease conditions will be discussed in terms of indications and contraindications for massage. Medical terminology will be introduced and used to prepare SOAP note documentation of massages performed. Students will perform circulatory massage techniques, and learn draping skills for full body relaxation massage. Students also learn chair massage techniques. The importance of self-care and good body mechanics are taught. Additional supervised table hours of practice outside of class are required and will be determined by the instructor.

TMAS 123 Therapeutic Massage Clinical I

1 Credits

Prerequisite: TMAS 140. Corequisite: TMAS 140. During this initial clinical rotation, students will function in the role of a massage therapist in a professional clinic setting. This provides students with a therapeutic massage clinical experience of working with the public while being supervised by a credentialed instructor. The attention of this clinical rotation is on practicing hands-on skills, developing treatment plans, and building confidence and interpersonal skills necessary for success as a massage therapist.

TMAS 125 Asian Healing Arts Theory and Methods

3 Credits

Prerequisites: APHY 101 and TMAS 120. Introduces the student to information and treatments designed around the approach of Asian medicine including energy systems, meridians, and the five elements theory. The basics of Shiatsu are included. Additional supervised table hours of practice outside of class are required and will be determined by the instructor.

TMAS 126 Jin Shin Do Bodymind Acupressure

2 Credits

Prerequisites: None. This class presents theories and techniques necessary for effective practice of Jin Shin Do Acupressure. Approximately half the time will be in lecture and half in practical hands-on skill. Students will be introduced to the basic theories of Traditional Chinese Medicine which is the basis of all Asian Bodywork Therapy. Students will learn 57 points in relation to surrounding anatomy. After this class, students will be able to utilize simple acupressure techniques alone or combined with massage sessions. With successful completion of this class, students are eligible to take the Intermediate Jin Shin Do class.

TMAS 140 Therapeutic Massage Training II

3 Credits

Prerequisites: TMAS 120 and APHY 101. Therapeutic Massage Training II continues with instruction offered in Therapeutic Massage Training I. Client consultations, conditions, and treatment plans are discussed. Emotional transference and psychological effects of massage will be addressed. Additional techniques addressed include deep friction, trigger point release, hydrotherapies, strain-counterstrain, range of motion and fascial release. Additional supervised table hours of practice outside of class are required and will be determined by the instructor.

TMAS 141 Massage Through the Lifespan

3 Credits

Prerequisites: TMAS 120 and APHY 101. This course teaches the therapist to work with pregnant mothers to help ease the discomforts and stress that accompany pregnancy. Contraindications for pregnancy massage and techniques to help with delivery are also addressed. Students learn the massage of infants and children to enhance bonding, relaxation, and comfort of the infant and child. This course explores the benefits of massage for the special populations, including pregnancy, of childhood, geriatric and disabled clients. Students gain mastery in massage for the robust and medically frail elderly client. Understanding the medical and psychosocial conditions of the elderly challenges the student to address specific needs in the end of life. Additional supervised table hours of practice outside of class are required and will be determined by the instructor.

TMAS 142 Aromatherapy

3 Credits

Prerequisites: TMAS 120 and APHY 101. This introductory course teaches the therapist the integration of essential oils and aromatherapy into massage techniques. Additional supervised table hours of practice outside of class are required and will be determined by the instructor.

TMAS 171 Personal Fitness Training

3 Credits

Prerequisite: None. The Personal Fitness Training course presents the concepts behind personal fitness, health and well-being. The course includes basic principles of human anatomy, physiology and exercise. Professional and legal practices are presented. Implementation of client's goals in an exercise program is discussed. Course includes both lecture and lab components. This program is designed to adequately prepare the student for the accredited NFPT-CPT Personal Trainer Board Certification Exam. The final exam for this course meets strict criteria and requirements imposed by the National Commission for Certifying Agencies (NCCA) accreditation standards. Successful board exam completion qualifies the student as a certified personal fitness trainer. Certification test fee will be in addition to tuition fees.

TMAS 172 Introduction to Yoga I for Massage Therapists

1 Credit

Prerequisites: None. Considers the holistic approach to Yoga intended for Massage Therapists to care for their bodies and increase flexibility. Beginning Hatha Yoga postures are taught and demonstrated with emphasis on correct alignment and relaxation of body and mind.

TMAS 173 Intermediate Yoga II for Massage Therapists

1 Credit

Prerequisites: TMAS 172. Considers the holistic approach to Yoga intended for Massage Therapists to continue to care for their bodies, increase flexibility, and decrease manage the stressors more effectively in their lives. A review of beginning postures is covered and intermediate Hatha Yoga postures are taught and demonstrated with emphasis on correct alignment as well as relaxation of body and mind. This course begins to deepen the practice so that application for use with clients can be introduced.

TMAS 174 Advanced Yoga III for Massage Therapists

1 Credit

Prerequisites: TMAS 173. Considers the holistic approach to Yoga intended for Massage Therapists to continue to care for their bodies, increase flexibility, and manage the stressors more effectively in their lives. A review of intermediate postures is covered and advanced Hatha Yoga postures are introduced. Demonstration with emphasis on correct alignment as well as relaxation of body and mind through various breathing exercises and meditation is taught. This refines the practice so that application for use with clients can be integrated into the massage setting.

TMAS 175 Fundamentals of Chair Massage

3 Credits

Prerequisites: TMAS 120. This course instructs the student in the fundamental techniques of chair massage and marketing chair massage events for promoting a massage practice. The student will develop a basic routine for chair massage as well as learn to adapt to specific clients and situations. Additional techniques will prepare the student to address common problem areas such as iliotibial band and lumbar pain.

TMAS 201 Sports Massage and Therapeutic Modalities

3 Credits

Prerequisites: TMAS 140. Corequisite: TMAS 140. Presents a specific application of massage therapy designed to train the therapist in the treatment of athletes. Includes: pre-event and post-event techniques, general maintenance massage, and therapeutic exercises. First aid for sports injuries and the use of hydrotherapies and other therapeutic modalities will be explored. Education on contraindications, including drug and supplement interactions, as they impact massage is learned. Additional supervised table hours of practice outside of class are required and will be determined by the instructor.

TMAS 202 Deep Tissue Techniques

3 Credits

Prerequisites: TMAS 140. Helps practitioners apply deeper techniques in the body therapy releasing chronically held tissue from past trauma, illness, or recent injury. Discusses the use of various treatment modalities. Deep tissue techniques include compression and compression with stroke. Indications, contraindications and precautions, including drugs and supplements, for deeper strokes is taught. Additional supervised table hours of practice outside of class are required and will be determined by the instructor.

TMAS 205 Pathology and Massage

3 Credits

Prerequisites: APHY 102 and TMAS 120. Corequisite: APHY 102. This course presents the basic concepts of diseases their courses and functional disturbances as they relate to body systems. Includes the precipitating risk factors and appropriate methods of patient education regarding various disease processes and specifications for massage treatment. This course teaches indications and contraindications for the various disease conditions and the appropriate strokes to utilize with each. Material also covers the impact of massage with the use of various drugs and supplements.

TMAS 206 Palpation Skills

2 Credits

Prerequisites: TMAS 140 and APHY 102. Corequisite: APHY 102. This course is designed to develop the student's palpation skills in order to enhance the practitioner's ability to evaluate the human body and energy systems. The course teaches a deeper understanding of muscular anatomy, which includes fascial material.

TMAS 207 Therapeutic Massage Experiential Seminar **2 Credits**

Prerequisites: APHY 102, TMAS 202 and TMAS 205. Corequisite: APHY 102, TMAS 202 and TMAS 205. This course provides the opportunity to observe, discuss and perform basic therapeutic massage related procedures under supervision, with learning experiences that prepare the student for practice in therapeutic massage clinics and/or health care facilities. Students refine palpation skills necessary to evaluate the human body and energy systems as well as a deeper understanding of muscular anatomy. In addition, students further develop their professional and business acumen. Additional supervised table hours of practice outside of class are required and will be determined by the instructor.

TMAS 209 Medical Conditions Massage Applications **3 Credits**

Prerequisites: TMAS 140, TMAS 205, and APHY 102. Corequisite: TMAS 205. This course prepares the therapist to work in all hospital settings, rehabilitation centers, physical therapy, health care, and other medical facilities. It also addresses medical considerations of various special populations and massage to promote healing, support, comfort, and adjunct therapies.

TMAS 210 Biomechanics **3 Credits**

Prerequisites: TMAS 140 and APHY 102. This course provides a basic understanding of joint movement and body motion. Addresses muscle action, origin and insertion, muscle synergists, antagonists, and evaluations of forces on each body region. Entry-level biomechanical principles with the structure, function and kinesiology of each body region will be explored. Effects of different drugs and supplements on muscles and movement will be studied. Students are introduced to measurement techniques and equipment. Additional supervised table hours of practice outside of class are required and will be determined by the instructor.

TMAS 220 Advanced Techniques **3 Credits**

Prerequisites: TMAS 140 and TMAS 141 and TMAS 201. This course is structured to provide the student with advanced training and clinical reasoning, focusing on client goals and assessment findings, and applications of various techniques through a case study. Analytical research of conditions and appropriate application to client's case will be conducted and reflected in documentation of case study. This course includes thorough client assessment techniques and is designed to expand the therapist into the medical field. The relationship of various illnesses and conditions to massage is discussed.

TMAS 221 Business Development **3 Credits**

Prerequisites: TMAS 140 and TMAS 115 or TMAS 102 and TMAS 122. Provides a basic understanding of the administrative and clinical responsibilities pertinent to a massage therapy business. Addresses computer usage, marketing, startup costs, financial requirements and office/administrative skills that will allow students to create, promote, and maintain their own business. Students participate in a group project and experiential clinic operation that will allow them to apply their skills and education in a practical setting. Additional supervised table hours of practice outside of class are required and will be determined by the instructor.

TMAS 223, Therapeutic Massage Clinical II **1 Credits**

Prerequisites: TMAS 140, and TMAS 202. Corequisites: TMAS 202. During this clinical rotation, students will expand their role as a massage therapist in a professional clinic setting. This provides students with a therapeutic massage clinical experience of working with the public while being supervised by a credentialed instructor. The attention of this clinical rotation is on enhancing advanced skill development and techniques, honing client communication, information interpretation and critical analysis skills in preparation for entering the profession.

TMAS 240 Advanced Sports Massage **3 Credits**

Prerequisites: TMAS 201. This course will continue the work of TMAS 201. The course will give the student an understanding of the protocol for working with professional teams. The team concept of (physician, trainer, coach, physical therapist, and massage therapist as one team unit) will be discussed. The student will gain marketability from advanced sports massage techniques. Additional supervised table hours of practice outside of class are required and will be determined by the instructor.

TRCK 100 Diesel Preventive Maintenance **3 Credits**

Prerequisites: None. Introduces the maintenance requirements and procedures of modern diesel engines and medium and heavy duty trucks. Proper procedures and requirements for the Federal Highway Safety Inspection (DOT) will be discussed and practiced. In addition, this course will prepare students to take a nationally recognized certification exam.

TRCK 101 Steering and Suspension Systems **3 Credits**

Prerequisites: None. Studies steering and suspension systems commonly used on modern tractors and trailers. Study will include steering and suspension components, power steering units, alignment theory and procedures, tire repair and service, and wheel balancing. Diagnosis, repair, and servicing of components including modern air suspension systems will be emphasized.

TRCK 105 Drive Train **3 Credits**

Prerequisites: None. Covers the chassis systems of trucks and includes clutch operation removal and adjustment, driveshaft removal and service, frame mounted accessories, truck bodies, and fifth wheel plates.

TRCK 121 Brakes**3 Credits**

Prerequisites: None. Theory, service, and repair of medium and heavy truck brake systems and their components. Emphasis is given to air brakes and their theory of operation, repair, and service of system components. Spring brakes and anti-lock systems will be studied on tractors and trailers.

TRCK 125 HT Manual Transmission/ Differential**3 Credits**

Prerequisites: None. Theory, diagnosis, and overhaul procedures related to manual transmissions and differentials. Course includes service of twin counter-shaft, under-drive, overdrive, power-dividers, and air shift systems.

TRCK 127 Engine Repair**3 Credits**

Prerequisites: None. Studies precision tools, equipment, and procedures needed to repair modern diesel engines. Repair, proper assembly, and component identification are studied along with service of removable cylinder liners.

TRCK 142 Truck Climate Control Systems**3 Credits**

Prerequisite/Co-Requisite: AUTI 111 and TRCK 224. This course covers air conditioning and heating systems used on modern trucks including auxiliary power unit usage for climate control systems. EPA regulations as well as recycle processes will be practiced. Trailer refrigeration will be discussed to explore the difference between refrigeration units and climate control systems.

TRCK 219 Diesel Engine Performance**3 Credits**

Prerequisites/Corequisites: TRCK 224. This course covers concepts in compression ignition (diesel) engine operation and computerized systems. Emphasis will be placed on the diagnosis and repair of mechanical and computerized engine controls, engine brakes, injection systems, basic emission components, and bus communication systems.

TRCK 224 HT Electrical Systems**3 Credits**

Prerequisites: AUTI 111, or AUTC 113. Tractor and trailer wiring systems will be discussed along with proper diagnosis and repair procedures. Lighting and warning systems along with computerized engine controls will be examined. Dash switches, controls, and gauges will be studied along with factory wiring diagrams.

TRCK 234 Advanced Diesel Emissions Controls**3 Credits**

Prerequisites/Corequisites: TRCK 244. This course covers advanced concepts in diesel engine emission control systems. New and future federal emission standards will be covered along with the sub-systems required to meet these standards. Emphasis will be placed on the diagnosis and repair of computerized system controls, injection systems, and emission components including EGR, DPF, and SCR systems.

TRCK 235 HD Truck Automatic Transmission**3 Credits**

Prerequisites: None. Theory of Operation, Diagnosis, and Overhaul Procedures related to automatic transmissions and electronically automated standard transmissions. Course includes service of torque convertors, automatic transmissions, and maintenance procedures of automatic transmissions.

TRCK 244 Diesel Engine Performance II**3 Credits**

Prerequisite/Co-Requisite: TRCK 219. This course covers concepts in compression ignition (diesel) engine operation and computerized systems. Emphasis will be placed on the diagnosis and repair of mechanical and computerized engine controls, engine brakes, injection systems, basic emission components, and bus communication systems.

TRCK 279 Diesel Capstone**2 Credits**

Prerequisites: Program Advisor Approval. This course covers advanced engine performance and electrical topics. This is a capstone course which prepares the student for entry into the field of diesel repair. With the help of Career Development Services, this course reviews the procedures for conducting a job search, resume and cover letter writing, interviewing, and follow-up communications. This course provides for taking program outcomes assessments.

TRCK 280 Co-Op or Internship**3 Credits**

Prerequisites: Program Advisor Approval. This course will provide qualifying students an opportunity to work at a job site that is specifically related to their career objective. This class will provide on-the-job experience while earning credit toward an Associate degree.

VIDT 111 Studio and Field Production I**3 Credits**

Prerequisites: VISC 105. Hands-on training in basic technical skills. Students will be provided with an overview of the video production process, and help the student learn the terms and concepts used in the industry. This understanding will serve as the foundation for subsequent courses in video technology.

VIDT 113 Introduction to Film Appreciation**3 Credits**

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. An introduction to understanding and appreciating movie and film. Students will analyze movies for narrative and story telling properties, cinematography, acting, editing and sound design.

VIDT 202 Studio and Field Production II

3 Credits

Prerequisites: VIDT 111. Focuses on knowledge and skills necessary to create and execute good video and audio productions. This course is designed to provide the student with a more complete view of the process of videography techniques and the video production process. Student will use the terminology and concepts used in the industry.

VIDT 203 Studio and Field Production III

3 Credits

Prerequisites: VIDT 110 or VIDT 210 and VIDT 111. Second in a series. Focuses on knowledge and skills necessary to create and execute good video and audio productions. This course is designed to provide the student with a more complete view of the process of videography techniques and the video production process. Student will use the terminology and concepts used in the industry.

VIDT 210 Production Editing I

3 Credits

Prerequisites: VISC 105. An introduction to non-linear, computer-based editing techniques and post-production skills. Focuses on knowledge and skills necessary to edit video and audio productions. Develops visual flow and continuity, and applies principles of visual design to video editing.

VIDT 211 Production Editing II

3 Credits

Prerequisites: VIDT 210 or VIDT 110 and VISC 113. An intermediate look at non-linear, computer-based editing techniques and post-production skills. Focuses on knowledge and skills necessary to edit video and audio productions for a variety of media outlets. Continues development of visual flow and continuity while applying principles of visual design to video editing. Requires performance and completed work to be portfolio quality.

VISC 101 Fundamentals of Design

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. Corequisites: ENGL 093 and ENGL 083. This course introduces students to fundamental design theory. Investigations into design theory and color dynamics will provide experiences in applying design theory, ideas and creative problem solving, critical peer evaluation, and presentation skills.

VISC 102 Fundamentals of Imaging

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. Corequisites: ENGL 093 and ENGL 083. Introduces students to a full range of image input technology and manipulation including conventional photography, digital imaging, and computer scanners. Students will learn to communicate concepts and ideas through various imaging devices. Explores composition and fosters creativity.

VISC 105 Video and Sound

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. Corequisites: ENGL 093 and ENGL 083. An introduction to the field of video technology. Students will learn the basics of planning, shooting, editing and post-producing video and sound. Projects include exercises in technical and creative skills application, equipment usage and production techniques.

VISC 107 Introduction to Screen Printing

1 Credits

Prerequisites: None. Beginning course in printmaking, which introduces students to the traditional techniques of silkscreen printmaking. Students are instructed in basic printing processes and in use of the screens. Emphasis will be on composition, craft, technical processes and translation of multiple types of content to print.

VISC 110 Interactive Design I

3 Credits

Prerequisites: VISC 101 and VISC 115 or VISC 102. An introductory level course which focuses on the tools, strategies, and techniques for interactive design and emerging technologies. Explores the process of integrating text, graphics, audio, and video for effective communication of information.

VISC 111 Drawing for Visualization

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. Corequisites: ENGL 093 and ENGL 083. Introduces students to the tools and methods of drawing. Presents drawing as a catalyst to seeing and a way of recording ideas. Gives students the necessary drawing preparation for the study of design.

VISC 112 Electronic Layout

3 Credits

Prerequisites: VISC 113 and VISC 115. Provides intermediate instruction in practical and creative page layout. Uses an industry standard desktop publishing package designed for single and multi-page documents as a tool for executing layouts. Produces samples for student portfolios, which may include stationery, charts, forms, brochures, and calendars.

VISC 113 Typography

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. Corequisites: ENGL 093 and ENGL 083. An introductory course which addresses the issues pertinent to the proper and creative use of type and the enhancement of communication. Covers the history of type, typographic terminology, design, attention to aesthetics, common sense, and how we read. Projects emphasize an appreciation of and the practical use of type.

VISC 114 Graphic Design I

3 Credits

Prerequisites: VISC 101 and VISC 115. Provides introductory instruction in design for communication primarily for print media. Teaches the steps in design development with meaningful message and concept. Produces samples for student portfolios, which may include elements or comprehensive projects in logo, stationery, newspaper, magazine, billboard, and interface design, etc.

VISC 115 Introduction to Computer Graphics

3 Credits

Prerequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENGL 093 and ENGL 083. Corequisites: ENGL 093 and ENGL 083. This course introduces students to fundamental computer graphics in visual communications. The initial focus of the course is on basic computer terminology and use, mastering fundamental skills, and developing efficient working styles. These skills are further developed through work with vector-based and page layout software used in the professional visual communications industry.

VISC 182-194 Special Topics in Visual Communications

1-3 Credit

Discusses topics of current interest in introductory visual communications. Identifies and offers various special topics during each term under this course number.

VISC 200 2-D Rendering and Animation

3 Credits

Prerequisites: VISC 101 and VISC 102 and VISC 115. Explores various software programs involved in creating multi-media presentations, digital movies, digital animation, introductory scripting through a series of short projects. Explore the role of interactive in contemporary marketing and design.

VISC 201 Electronic Imaging

3 Credits

Prerequisites: VISC 101 and VISC 102. Examines the area of raster image editing and current electronic darkroom software packages. Experience with the digital imaging environment includes calibrating scanning processes, digital camera input, manipulating images in black and white and color, working with retouching for advertising, illustrating text, and working with various output devices. Digital color spaces as they relate to various output devices will be covered. Calibration for 4-color separations and prepress procedures will be discussed as well as preparing images properly for the web.

VISC 202 Special Projects

3 Credits

Prerequisites: Program Chair Approval. Provides advanced instruction in specific areas of student interest or at the instructor's discretion may include actual community or non-profit projects. Requires performance and completed work to be portfolio quality and strengthen skills in visual communication emphases.

VISC 203 Independent Study

3 Credits

Prerequisites: Program Chair Approval. Provides advanced students with opportunities to design projects for specified areas of interest and skill development. Requires the project plan to be approved by the instructor. Restricts work to student program area emphasis. Requires performance and completed work to be portfolio quality.

VISC 204 Mobile App I

3 Credits

Prerequisites: VISC 110. This course brings together the skills learned in Web Design I, and Interactive Media I in the design and creation of simple mobile applications (apps). Students will implement XHTML/HTML5, CSS3, and Javascript to synthesize example mobile apps designed to run on current mobile computing devices. The focus of this course is to show the relationships between technologies that enable the creation of these applications, including current frameworks that aid in their development, with an emphasis on CSS (visual presentation) and Javascript (behavior).

VISC 205 Business Practices for Visual Artists

3 Credits

Prerequisites: VISC 201 and ENGL 111. Corequisite: VIS 201. Examines legal and business issues affecting the professional visual artist.

VISC 206 Interdisciplinary Studies

3 Credits

Prerequisites: VISC 210 or VISC 217 or PHOT 109 or PHOT 209 or VIDT 202. Offers students the opportunity to complete selected projects while working in a team environment with students of other disciplines. Simulates situations found in industry.

VISC 207 Portfolio Preparation

2 Credits

Prerequisites: Program Advisor Approval and ENGL 111 and MATH 1XX. Provides advanced facilitation focusing on the students' final preparation for the workforce. Requires an evaluation and portfolio development plan to be approved by the instructor. Finalizes project work demonstrating acquired knowledge and skills, along with resume and cover letter, for presentation to prospective employers. Also provides students with the opportunity to use one credit for field of study.

VISC 208 Mobile App II

3 Credits

Prerequisites: VISC 204 and VISC 210. This continuation course expands the concepts and skills from Web Design II and Mobile Web App Design I in the design and creation of a custom mobile web application. Students will propose a custom mobile web application, provide wireframes/prototypes, create working model(s), perform user testing, and provide full documentation for the app. Upon completion, students will have a comprehensive understanding of the mobile web application development cycle, as well as a commercial-ready mobile web application for distribution.

VISC 209 3D Rendering and Animation I

3 Credits

Prerequisites: VISC 102. Examines the virtual world of 3D and how it can be applied as an illustration and animation element in multimedia. Students will explore navigation, modeling, rendering, animation, and camera and lighting techniques.

VISC 210 Interactive Design II

3 Credits

Prerequisites: VISC 102 and VISC 110 and VISC 113. Further focuses on the tools, strategies, and techniques for web site design, architecture, navigation, language, and production. Explores more in-depth the methods for creating successful websites from concept to implementation. Explores the process of integrating text, graphics, audio, and video for effective communication of information.

VISC 211 Interactive Media II

3 Credits

Prerequisites: VISC 103 and VISC 201. Further explores various software programs involved in creating; multi-media presentations, digital movies, digital animation and scripting.

VISC 212 3-D Rendering and Animation II

3 Credits

Prerequisites: VISC 209. Further examines the virtual world of 3D and how it can be applied as an illustration and animation element in multimedia. Students will expand on navigation, modeling, rendering, animation, and camera and lighting techniques.

VISC 213 Advanced Electronic Imaging

3 Credits

Prerequisites: VISC 201. The creation of the electronic image from digital imaging and scanning devices is further investigated. Advanced Adobe Photoshop illustration techniques are taught. Other software such as Adobe Dimensions and Fractal Painter are introduced. Students will work with both raster and vector software to create final output. An emphasis in final output is given to portfolio projects that are in the print, web, and film media.

VISC 214 Advanced Electronic Layout

3 Credits

Prerequisites: VISC 112. Provides advanced instruction in creative publication design. Uses an industry standard desktop publishing package to design and publish professional multi-page documents. Produces samples for student portfolios, which may include annual reports, catalogs, newsletters, menus, magazine design, newspaper design, book design and/or other multi-page communications. Requires performance and completed work to be portfolio quality.

VISC 215 Web Design III

3 Credits

Prerequisites: VISC 210. Further explores the topic of Web Design by introducing content management systems (Wordpress, Joomla, etc.), server and client-side scripting, frameworks, and the implementation of HTML5/CSS3 in modern web design. Explores the concepts associated with designing web pages for a variety of display devices.

VISC 216 Electronic Illustration

3 Credits

Prerequisites: VISC 115. Provides intermediate instruction in illustration techniques using computer software designed for creating illustrations, technical, drawing, logos, packaging, maps, charts, and graphs. Emphasis is on preparing effective, creative illustrations for various media applications in an efficient, productive manner. Produces samples for student portfolios.

VISC 217 Graphic Design II

3 Credits

Prerequisites: VISC 102 and VISC 113 and VISC 114. Provides intermediate instruction in design for communication primarily for print media. Further explores design theory by applying concepts to achieve meaningful marketing and advertising results. Produces samples for student portfolios, which may include elements or comprehensive projects appropriate to trade/industrial advertising, brochures, flyers, pamphlets, posters, direct mail and/or consumer magazine advertising/branding, etc.

VISC 218 Digital Process and Workflow

3 Credits

Prerequisites: VISC 113 and VISC 115. This course focuses on the issues of digital process and workflow in the visual communications industry. Emphasis is placed on successful creative problem-solving skills, production of multi-media solutions, and working in a team environment. Topics covered include video and sound, digital photography solutions (studio and location), graphic design, graphic print production, printing technologies, file management and various forms of interactive media.

VISC 219 Graphic Design III

3 Credits

Prerequisites: VISC 201 and VISC 217. Provides advanced instruction and experience with design projects/branding identity, which communicate a common theme or campaign through several different media – magazine, billboard, radio, television, direct mail, brochures, point of purchase, sales promotions and/or package design, etc. Produces samples for student portfolios.

VISC 280 Co-op/Internship

1-6 Credits

Prerequisite: Advisor's Approval. Students work at job sites that are specifically related to career objectives. Provides on-the-job experience while earning course credit.

WELD 100 Welding Fundamentals

3 Credits

Prerequisites/Corequisites: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in FOUN 071. This course provides a basic study and application of commonly utilized welding processes as well as additional topics such as: welding blue print reading, OSHA 10 hour and welding safety, weld joint design, welding terminology, and welding quality control. Students will prepare for their welding education, as well as their welding career through exposure to the welding lab environment and classroom. Students will also train with the latest in Virtual Welding Simulation. In addition, this course will prepare students to take nationally recognized certification exam(s).

WELD 107 Welding Troubleshooting

3 Credits

Prerequisites: WELD 101 or WELD 109. Covers evaluation of weldments, welding procedures and tolerances, joint design and alignment. Also covers weld defects caused by improper equipment settings, equipment failure, base metal, improper filler metal, and improper shielding of welds. Emphasis will be placed on weldability of metals.

WELD 108 Shielded Metal Arc Welding I

3 Credits

Corequisites: WELD 100 or INDT 114. Provides students with the knowledge of shielded metal arc welding operations and equipment. Provides extensive practice time to produce the skills to make satisfactory welds with this process. Emphasizes safety hazards and safety practices in arc welding.

WELD 203 Pipe Welding I

3 Credits

Prerequisites: WELD 206. This course provides extensive practice in the preparation and welding of pipe in the 2G and 5G position, and information of preparation, methods of welding, and electrode and filler wires used.

WELD 204 Pipe Welding II

3 Credits

Prerequisites: WELD 203. Provides extensive training in the preparation and welding of pipe in the 5G and 6G position. Includes information on preparation, method of welding, and electrodes and filler rods used.

WELD 206 Adv. Shielded Metal Arc Welding II

3 Credits

Prerequisites/Corequisites: WELD 108. Covers SMAW welding equipment and products used to produce groove type butt and fillet welds. Provides extensive practice to develop the skills to achieve satisfactory welds of this type. Safety hazards and safe practices in arc welding are emphasized. In addition, this course will prepare students to take nationally recognized certification exam(s).

WELD 207 Gas Metal Arc (MIG) Welding

3 Credits

Corequisites: WELD 100 or INDT 114. Considers various gas metal welding (GMAW) processes including microwire, flux-core, inner shield, and submerged arc with emphasis on metal inert gas welding. Techniques of welding in all positions on various thicknesses metal.

WELD 208 Gas Tungsten Arc (TIG) Welding

3 Credits

Corequisites: WELD 100 or INDT 114. Provides students with thorough knowledge of the gas tungsten arc welding process. Includes detailed study of the techniques of making welds in all positions using the GTAW applications. Lectures and discussions provide additional background information essential to a qualified GTAW welder.

WELD 209 Welding Certification

3 Credits

Prerequisites: Advisor Approval. Prepares the student for certification in shielded metal arc, GTAW (Gas Tungsten Arc Welding), GMAW (Gas Metal Arc Welding) and other welding processes through study of the welding procedures and standards established by agencies such as the American Welding Society and the American Society of Mechanical Engineers.

WELD 210 Welding Fabrication I

3 Credits

Prerequisites: WELD 108 and WELD 207. Provides for continued practice in hands-on fabrication of welded products. Include basic equipment used in fabrication.

WELD 211 Welding Fabrication II

3 Credits

Prerequisites: WELD 210. Provides opportunities for practice in hands-on fabrication of welded products. Includes basic equipment used in fabrication.

WELD 271 Blueprint Reading for Welders

3 Credits

Prerequisite: None. Provides the basic concept of reading a fabrication blueprint and covers the different parts of the print. It also provides an understanding of welding symbols used in blueprint reading. Computations of basic measurements including fraction and metrics along with conversion from one to the other are also covered. This course is designed for beginning welders and fabricators, and anyone needing to understand basic fabrication and assembly blueprints.

WELD 272 Adv. Gas Metal (MIG) Welding II**3 Credits**

Prerequisites/Corequisites: WELD 207. Provides advanced skills and fundamental knowledge in Gas metal Arc Welding. This course is designed for intermediate to advanced welders and fabricators, and those seeking welder certification. Emphasized safe practices in Gas metal Arc Welding. In addition, this course will prepare students to take nationally recognized certification exam(s).

WELD 273 Adv. Gas Tungsten Arc Welding II**3 Credits**

Prerequisites/Corequisites: WELD 208. Provided advanced skills and knowledge in Gas Tungsten Arc Welding. This course is designed for intermediate welders, auto service and body technicians, and individuals in the HVAC industry. Emphasizes safe practices in advanced Gas Tungsten Arc Welding. In addition, this course will prepare students to take nationally recognized certification exam(s).

WELD 274 Flux Core Arc Welding**3 Credits**

Prerequisites: INDT 114 or WELD 100. Covers Flux Core Arc Welding (FCAW) equipment and products used to produce groove and fillet welds. Provides extensive practice to develop the skills to achieve satisfactory welds in all positions, using self-shielding and gas shielded electrode wires. Provides the opportunity to achieve AWS qualification or certification. Safety hazards and safe practices in FCAW are emphasized.