001 Horticulture/Landscape Specialist

10-001-108 Plant Propagation (2 cr.)
Addresses production and propagation techniques for growing plants. Students will explore using a variety of equipment and methods.

10-001-109 Landscape Construction 2 (2 cr.)
Teaches students to work with advanced construction projects, materials and methods. Students learn to develop a mobilization plan and a management system for project implementation.

10-001-111 Introduction to Horticulture (3 cr.)
Provides an overview of the horticulture profession, including its role and importance throughout history. Current trends and career opportunities will be covered. Particular attention is given to horticulture crops, plant classification, their use, and the interrelationships between the environment, plant growth and plant development.

10-001-112 Horticulture Soils (3 cr.)
Explores the properties of soils and applies them to horticultural uses as a growing medium and as an engineering base for landscaping.

10-001-113 Ornamental Plant Health Care (3 cr.)
Emphasizes identification of and control of insects and diseases, with a focus on plant health care and maintenance. An integrated pest management approach in diagnosing pest problems and the control of pests using biological culture, physical and chemical applications will be included. Calibrations, laws, regulations, safety and ecological impact are also covered. Training and testing for the Wisconsin commercial pesticide Applicator Exam Category 3.0 Landscape and Turf is part of this course.

10-001-117 Equipment Operation, Horticulture (2 cr.)
Teaches students how to operate a variety of landscape equipment. Hands-on training will require the students to acquire an understanding of the safe operation of equipment. Focus will be on pre-operation, operation, and post-operation procedures and skills.

10-001-118 Irrigation Systems & Maintenance (2 cr.)
Develops a basic understanding of irrigation design. The focus is on irrigation installation, troubleshooting, maintenance and repairs.

10-001-120 Interiorscaping & Greenhouse Mgmt (3 cr.)
Studies the identification, characteristics and physical requirements of interior plants. Also studies the operation of a greenhouse to include growing, soils, pest control, and basic procedures for operating and maintaining a greenhouse.

10-001-130 Turf Mgmt & Irrigation Systems (2 cr.)
Studies the overall basics of lawn (turf) applications including soils, grading, Wisconsin grasses and maintenance. Students will develop an understanding of the design, operation and maintenance of irrigation systems.

10-001-131 Organic Lawn Care (2 cr.)
The study and installation of organic inputs for healthy lawns. Students will brew compost tea, make compost and operate lawn care equipment. They will develop a lawn care plan that will focus on sustainability and reduction of continuing inputs.

10-001-132 Landscape Estimating (2 cr.)
Teaches students to estimate all costs related to landscape projects and how to manage project costing.

10-001-140 Plant Diagnostics (2 cr.)
Covers the science of making proper diagnoses of plant insects and disease problems and appropriate control strategies. Students will learn the difference between signs and symptoms and identification of problem plants.

10-001-143 Horticulture Work Experience 3 (3 cr.)
A three-credit course that deals with independent horticulture/landscape work experience, which is planned with each student and FVTC staff. Department consent is required.

10-001-158 Woody Ornamental Plant ID (3 cr.)
Explains plant classification and identification techniques. Students will utilize these techniques to properly name and identify commonly used deciduous and evergreen trees and shrubs. Culture and care will also be discussed.

10-001-159 Survey of Herbaceous Plants (3 cr.)
Studies commonly used annual, bulb and perennial herbaceous plants, with an emphasis on their use in the landscape, culture and care.

10-001-170 Landscape Plants, Maintenance of (3 cr.)
Studies the maintenance and care of woody plants, including evergreens, vines, garden flowers, bulbs and nursery stock. Discusses pruning, training, fertilizing, watering, planting, physical and chemical control of plant growth, transplanting, winterizing, weed control and production.
Course Descriptions

10-001-174 Landscape Design Fundamentals 1 (3 cr.)
Focuses on developing a residential landscape plan using such outdoor room concepts as function, design principles and composition. The course also includes drafting, site analysis and graphics.

10-001-180 Landscape Construction 1 (2 cr.)
Covers site conditions, landscape tools, and design plan implementation.

10-001-181 Landscape Construction 1 (3 Cr.) (3 cr.)
Covers site conditions, landscape tools, and design plan implementation.

10-001-184 Landscape Design 2 (3 cr.)
Teaches students to design and detail landscape projects with construction documents and estimates. The course will also focus on specialty landscape.

47-001-403 Ponds & Water Features (0.2 cr.)
Develops an understanding of pond and water feature design and construction. The do’s and don’ts will be discussed.

47-001-404 Perennials, Grasses & Annuals (0.5 cr.)
Teaches students how to use perennials in their gardens. Topics will include planting, propagation and care.

47-001-405 Garden Structures (0.5 cr.)
Teaches students to build structures for their yard. Also addressed will be the safe operation of wood shop equipment. Students will receive design assistance for their projects.

47-001-406 Landscape Maintenance (0.2 cr.)
Focuses on pruning and plant care. Insects and diseases common to residential sites will be discussed.

47-001-409 Trees and Shrubs (0.4 cr.)
Discusses the trees and shrubs common to our area, what’s new in plant material, and tree and shrub maintenance.

47-001-410 Special Gardens (0.3 cr.)
Teaches students about the design and construction of cottage gardens, butterfly and hummingbird gardens, and rock gardens.

47-001-411 Lawn and Turf (0.1 cr.)
Explores what makes good turf. Students will learn what their turf needs and how to improve their lawn.

47-001-412 Landscape Construction (0.4 cr.)
Discusses construction options and approaches to construction. Students will get hands-on experience with patios and walls.

47-001-413 Landscape Design (0.4 cr.)
Teaches students how to draw a landscape plan of their site. The class will discuss the design options that can improve their landscape projects.

47-001-414 Low-Voltage Lighting (0.1 cr.)
Teaches students how to develop a plan for outdoor lighting. Students will also learn how to install a low-voltage lighting system.

003 Agribusiness Facilities & Equipment

10-003-110 Agriculture Hydraulic Systems (2 cr.)
Introduces the student to the fundamentals of fluid power, components, different hydraulic systems, hydraulic schematics and terminology of the hydraulic systems used on modern agriculture mobile equipment. Includes operation of fluid flow on various systems, maintenance and system diagnostics. Students are exposed to the special tools used to test hydraulic systems. The use of these special tools and technical manuals are stressed.

10-003-115 Agriculture Air Conditioning (1 cr.)
Provides theory of operation, service and testing of air conditioning units used to cool operator's cab of modern equipment. Students will have lab work consisting of leak detection, evacuation, charging of systems, R-12 to R134A conversions, electrical circuits and diagnostics of systems. Students will have the opportunity to apply for the Wisconsin State Air Conditioning Certification.

10-003-118 Ag Diesel Engine Systems (3 cr.)
Introduces the basic knowledge of a diesel combustible engine. Students will learn the skills and knowledge needed to diagnose, maintain and adjust diesel engines found in agricultural machines and equipment. Use of technical manuals and precision measuring equipment is stressed.

10-003-119 Ag Diesel Engine Rebuilding (4 cr.)
Provides the skills and knowledge needed to overhaul diesel engines used in agricultural machines and equipment. Students’ use of proper tools and technical manuals will be stressed. Students will overhaul various diesel engines. It is recommended to have successfully completed Ag Diesel/OPE Engine Systems.

10-003-120 Ag Planting Equipment (3 cr.)
Provides a comprehensive study of planting equipment. There will be extensive coverage of planting and seeding equipment. Units to be covered will include no-till drills, corn planters and seed metering units. Students will work with the seed metering test stand to rebuild and calibrate the seed meters.
10-003-121 Ag Grain Harvesting (3 cr.)  
Provides theory of operation, adjustments and service repair of grain and forage harvesting equipment. Lab work includes hands-on service of combine and forage harvesting equipment. Machines covered include combines, self-propelled and pull-type forage harvesters, round, small and large square balers.

10-003-123 Agriculture Power Transmission (4 cr.)  
Provides theory and power flow of various transmissions used on agriculture power driven equipment. Includes collarshift, synchronized and powershift transmissions. Also covers differentials, final drives, PTO clutches and tractor clutches. Proper use of spatiality tools and technical manuals is stressed.

10-003-126 Skid Loader/Compact Equipment (3 cr.)  
Provides the knowledge and skills needed to operate, diagnose and repair skid loaders and telehandler equipment. Involves areas of training of both in electrical, hydraulics, drive transmissions, operational adjustments and operation. It is recommended to have successfully completed Electrical and Ag Hydraulics.

10-003-127 Introduction to Agriculture Engineering Technology (3 cr.)  
Studies engineering concepts and principles as they apply to farm power and machinery, electrical energy and processing, structures and environment, irrigation and drainage, and food engineering. The laboratory will provide an opportunity to develop techniques in design, planning, construction and performance evaluation.

10-003-129 Shop Safety/Tool Application (2 cr.)  
Focuses on equipment shop safety, correct tool usage and types of fasteners. Students will perform some basic duties in the shop using different types of tools and fasteners. Students will gain knowledge of the different types of tools and fasteners.

10-003-130 Agriculture Forage Harvesting Equipment (2 cr.)  
Focuses on forage harvesting equipment. Students will perform necessary adjustments and repairs associated with the forage harvesting equipment.

10-003-131 Ag DC Electrical Systems (3 cr.)  
Focuses on DC electron flow theory, different types of circuits and troubleshooting the circuits. Students will also use schematics to diagnosis problems. Starting and charging systems will be covered.

10-003-132 Advanced Ag Hydraulic Systems (2 cr.)  
Provides students the opportunity to work with various types of hydraulic systems used on agriculture equipment. They will do testing, diagnostic and repair of these systems. Students will need to complete Agriculture Hydraulic Systems before enrolling in this class.

10-003-133 Dealership Parts/Service (3 cr.)  
Introduces the student to the role and function of the parts and service department of a dealership. Included are service reports, repair orders, warranty process, computerized parts invoicing, parts inventory, merchandising and customer relations. Students will work with a parts and service software program.

10-003-165 Feed/Grain/Animal Waste System (2 cr.)  
Introduces the students to methods and equipment used on farms for feed storage, handling and processing. This course also covers the collection, storage, treatment and equipment used in the disposal of animal wastes.

10-003-166 Ag/OPE Welding (2 cr.)  
Prepares students to perform oxyacetylene, arc, MIG and TIG welding procedures. Laboratory activities will provide the student with hands-on practice joining metal with the various methods of welding.

006 Agribusiness & Science Technology

10-006-102 Integrated Pest Mgmt & Weed Identification (3 cr.)  
Acquaints students with the general use, safety, laws and regulations for chemical application in Wisconsin. Completion of the Wisconsin Commercial Applicators Certification is an optional portion of the course. Identification of the major weeds found in Wisconsin crop lands is emphasized.

10-006-103 Agricultural Marketing (3 cr.)  
Explores and gives the student an understanding of the basic principles of marketing and the ability to apply these principles to the distribution of farm products.

10-006-105 Crop Protection and Amendments (2 cr.)  
Acquaints students with specific herbicide, insecticide and fungicide in Wisconsin crops. Relationships between plant, environment, safety and crop effectiveness will be emphasized.
10-006-107 Vet Science-Small Animal (1 cr.)
Emphasizes how animals are an interesting and important part of our lives. Class topics will include small personal pets, horses and other recreational animals. Each group of animals will be studied in terms of care, behavior, habitat, feeding, reproduction and impact on our society.

10-006-109 Crop Scouting Training (3 cr.)
Includes hands-on identification and management of insects, diseases and seedling weeds found in Wisconsin crops. Crop development and herbicide damage issues will also be covered.

10-006-110 Agribusiness Computer Application (2 cr.)
Provides an overview of personal computer operating systems in use. Students examine Windows 2000/Windows XP and the latest uses for computers in production agriculture and agribusiness.

10-006-112 Dairy/Livestock Artificial Insemination (1 cr.)
Focuses on the anatomy and physiology of reproduction and insemination procedures. It includes such topics as reproductive management, nutrition, fertility and herd health. There will be insemination practice on live animals.

10-006-113 Dairy/Livestock Nutrition (3 cr.)
Acquaints the students with the nutrients essential for livestock growth, production and reproduction. The anatomy and physiology of digestion and nutrient absorption will be discussed for the single stomach and ruminant animal. Proper feed sampling techniques, feed analysis and other nutritional information will be covered in preparing the student for Dairy/Livestock Ration Balancing.

10-006-114 Dairy/Livestock Ration Balance (3 cr.)
Teaches students the mechanics of balancing livestock rations using the National Research recommendations and other information. Computers will be used to develop rations. The makeup and functions of the nutrients essential for livestock will be discussed in the preparation of dairy and beef rations. The student will complete a cost analysis of all rations.

10-006-115 Agribusiness Work Experience 2 (2 cr.)
Provides independent work experience with each student in cooperation with an employer and FVTC staff.

10-006-116 Agribusiness Work Experience (3 cr.)
Provides independent agribusiness work experience in cooperation with an employer and FVTC. Students are evaluated by the employer and supervised during the work experience by a FVTC instructor. Department consent required.

10-006-119 Agricultural Crop Production (3 cr.)
Prepares students to recognize and implement basic crop production management techniques for corn, soybeans, alfalfa, small grains and general forages used on Wisconsin farms. Field preparation, fertility, seed selection, planting and in-season management of specific crops will be emphasized.

10-006-127 Agriculture Microcomputer-Dairy Recordkeep (1 cr.)
Acquaints students with herd management programs using traditional and computerized record keeping systems. Students use the latest programs available.

10-006-133 Agribusiness Overview (3 cr.)
Provides an overview of agricultural production, manufacturing, distribution, utilization and consumption in the United States, with an emphasis on Wisconsin agribusiness. Employment opportunities are explored. Business organization, operation and management are also covered.

10-006-134 Agribusiness Sales/Marketing (3 cr.)
Covers the basic knowledge of agribusiness sales and marketing. Topics include recognizing potential customers and building a positive customer relationship, designing marketing plans, and using marketing and sales databases. The concepts will be presented using hands-on activities.

10-006-135 Agriculture GPS Application (2 cr.)
Explores the GIS/GPS technology equipment and computer software program used by many agronomy departments. Hands-on field assignments are used for managing crop production.

10-006-138 Horse Science (2 cr.)
Covers important information for safe and successful horse ownership. Topics include horse psychology and learning, financial and time commitments, care, stable management, nutrition, successful purchasing, breeding plans, diseases and first aid, historical development and more.

10-006-140 Animal Science Fundamentals (3 cr.)
Provides fundamental knowledge of the animal science field. Topics include animal health, animal environments, anatomy and physiology, genetics and reproduction, animal feedstuffs, and job-related safety. Students will experience animal concepts through the completion of hands-on activities.
10-006-141 Plant Science (3 cr.)
Provides fundamental knowledge of plant components and their functions. Topics include pollinating and propagating plants, germinating seeds, plant nutrients, and factors affecting photosynthesis, respiration, and transpiration. Students will experience plant components and their functions through the completion of hands-on activities.

10-006-143 Introduction to Soils (3 cr.)
Provides fundamental knowledge of soils and growth media. Course topics include soil formation and development, soil components, soil profile, soil classification and soil conservation. Students will experience soils concepts through the completion of hands-on activities.

10-006-145 Dairy/Livestock Herd Health (3 cr.)
Covers the herd health and reproductive systems of the dairy and livestock animals. The class will cover various herd health problems, including mastitis, milk fever and similar common livestock health problems. A herd health and reproductive management program will be developed.

10-006-147 590 Nutrient Management Plans (3 cr.)
Enables the student to develop and write a 590 nutrient management plan for their farm or a selected Wisconsin farm. Components of a plan, laws affecting a plan and completion of a plan are emphasized.

10-006-148 Dairy Genetics and Reproduction (3 cr.)
Designed for the student who needs a comprehensive knowledge of dairy genetics and reproduction. Emphasis is on basic genetic principles and sire selection. Students will learn the anatomy and physiology of the bovine female reproductive tract and the management of the estrous cycle in cattle.

10-006-149 Dairy/Livestock Records Management (3 cr.)
Acquaints the students with herd management programs using traditional and computerized herd record keeping systems. Students will have hands-on experience with the latest available programs used in dairy record keeping.

10-006-150 Field Sprayers & Granular Applicators (3 cr.)
Enables the student to become familiar with the equipment used when handling and applying liquid and granular crop protection products and amendments. Equipment operation, maintenance, calibration and safety will be emphasized. Both small and large equipment will be operated as part of the class.

007 Biotechnology

10-007-174 Applied Microbiology (4 cr.)
This survey course includes the structure, function, ecology, nutrition, physiology and genetics of microorganisms in industrial, agricultural, food and medical microbiology. It also includes an introduction to standard techniques and procedures in the microbiology laboratory.

057 Natural Resources

10-057-104 Exploring Natural Resources (4 cr.)
Provides basic study of natural resources, focusing on their abundance, importance and conservation. The physical biological variables of the environment will be studied in field and classroom settings. Career development will be incorporated to expose students to job-related activities for the following core areas: wildlife and fisheries, forestry, surveying, outdoor recreation, soils, and water quality and wastewater management.

10-057-106 Surveying 1 (3 cr.)
Introduces the use of an auto level, laser level and theodolite. Emphasis is on the fundamental concepts and principles of basic topographic surveying and mapping. Several computer programs are used to generate maps.

10-057-107 Surveying 2 (3 cr.)
Acquaints the student to the open and closed traverse and the general methods utilized with the total station and data collector for field data collection. Computer software programs are used to help aid the student in map production.

10-057-108 Natural Resource Technical Field Experience (3 cr.)
Involves fish and wildlife projects identified by the natural resources team. Possible projects include computer work, wetland restoration, GIS and GPS work, fish surveys, prescribed burnings, dike construction, use of tranquilizer dart and blow guns, and sturgeon data collection.

10-057-109 Ecology (2 cr.)
Examines the relationships and interrelationships of living organisms in their environment. Students study natural selection and speciation, environmental conditions, populations and competition, succession, energy flow and biogeochemical cycles, and the diversity of ecosystems.
10-057-113 Natural Resource Technical Field Experience 2 (3 cr.)
Involves the continuation of working on wildlife experience and project identified by the natural resources team. Prescribed burnings and wildland fire suppression experiences are the primary functions of this class. In inclement weather, activities such as dike construction, sturgeon data collection, GIS/GPS work may act as supplements. Successfully completing a physical test is required for this class. The test may be accomplished through FVTC’s Fitness Center.

10-057-128 Wildlife Mgmt - Nongame and Hunted Species (3 cr.)
Introduces wildlife ecology and management. The course focuses on habitat restoration and maintenance, deer management, wildlife damage control, ecological concepts and population dynamics.

10-057-129 Fish Mgmt-Ichthyology,Limnology/Field Pract (3 cr.)
Students will learn about fish identification and classification, and lakes and streams as a life environment. Field techniques and practices used in studying and managing fish will be presented. Several hands-on field experiences are conducted.

10-057-130 Recreation Facilities Maintenance (3 cr.)
Introduces general maintenance activities applied at recreation facilities through a combination of lecture, lab and fieldtrips. Planning and maintenance of various recreation trail types and facilities along with the operation and maintenance of chainsaws, brush saws and lawn care equipment.

10-057-131 Forest Recreation Environmental Education (3 cr.)
Emphasis will be creating and presenting environmental education activities to various audiences. The design and delivery of environmental curriculum is the focus and will be augmented with additional public presentations and volunteering at area environmental centers. Individual and group laboratory projects and presentations are required.

10-057-132 Forestry 1 (3 cr.)
Covers tree and shrub identification (dendrology), forest mapping, stand inventory, basic forest ecology, silvicultural practices and timber types. This course prepares students to perform more specific job-related tasks in Forestry 2.

10-057-133 Forestry 2 (3 cr.)
A continuation of Forestry 1 with studies of aerial photography applications, logging operations, lumber scaling and grading, fire weather and fire suppression, tree planting and seeding operations, forest diseases and insects of the lake states. It culminates with field trips to natural resource agencies to view the practices and principles learned during class.

10-057-134 Soil and Water Conservation (3 cr.)
Examines the physical, chemical and biological properties of soil in relation to water and wind erosion. The identification, planning and use of soil and water conservation practices are examined, and students study the relationship of soil fertility to conservation and management.

10-057-135 Soil and Water Conservation/Engineering (3 cr.)
Explores in greater detail soil and water conservation practices including planning, design, quantities, cost lists and field layout. Auto level, theodolite and laser level will be used throughout class. Field locations will help familiarize students with the standards and specifications used in the design of structural and vegetable erosion control practices. Proper construction and maintenance of these practices are stressed.

10-057-136 Water Quality and Wastewater Management 1 (3 cr.)
Examines the physical, chemical and biological characteristics of surface and groundwater. Water quality standards and regulations are discussed. Surveys of the various forms and sources of water pollutants are conducted, and water quality assessments, using biological indicators and chemical tests, are covered. The course includes a brief overview of the treatment process.

10-057-137 Water Quality and Wastewater Management 2 (3 cr.)
Studies in Waste treatment systems in detail, including the collection, handling and disposal of wastewaters and sludges. Laboratory work emphasizes the tests and methods used to evaluate the performance of treatment units.

10-057-140 Plant Identification (1 cr.)
Provides a basic study of the trees, grasses, herbs and aquatics of Wisconsin. The class focuses on the principal species of seven major plant communities: forest, bog, agriculture, prairie, marsh, shrub and beach.
10-057-142 Natural Resources Co-op Experience (2 cr.)
Enables the student to volunteer 80 hours of service to one or more natural resource agencies for approved job training. The student’s progress is monitored by the instructor through direct communication with the participating agency. This course is taken in the fall semester of a student’s final academic year.

10-057-143 Natural Resources Common Topics (2 cr.)
Introduces U.S. public land surveys, topographic maps, orienteering principles and mapping. Other topics include the polar planimeter, dot grid, abney levels and clinometers, basic aerial photo uses, and chainsaw use and maintenance.

10-057-162 S212 Wildland Fire Chain Saws (1 cr.)
Provides introduction to the function, maintenance and use of internal combustion engine-powered chainsaws and their tactical wildland fire application.

058 Wildland Firefighter AAS

10-058-160 Wildfire Intro S130/S190/L180 (2 cr.)
Prepares new firefighters in basic firefighting skills and behavior factors that will aid them in the safe and effective control of wildland fires.

10-058-163 S290 Intermediate Wildland Fire Behavior (1 cr.)
Designed to prepare the prospective supervisor to undertake safe and effective fire management operations.

10-058-164 S234 Ignition Operations (1 cr.)
Provides training in the functional roles and responsibilities connected with firing operations. The course covers planning, ignition procedures, techniques and equipment applicable to wildland and prescribed fire. It also addresses the role of the ignition specialist or firing boss as the organization manages escalation from a non-complex to a complex fire situation.

10-058-166 S390 Fire Behavior (2 cr.)
Provides an introduction to Wildland Fire Behavior Calculations, which develops knowledge and skills required for effective fire behavior prediction.

10-058-167 Live Fire Training (2 cr.)
Trains students in live fire situations such as prescribed burning and/or wildfire suppression. Includes inventory, minor repair and maintenance of equipment before and after burns and during possible standby situations. Successfully completing a physical test is required for this class. The test may be accomplished through FVTC’s Fitness Center.

10-058-168 Grassland & Forest Management (2 cr.)
Examines grass and forest ecosystems from a wildland fire perspective.

10-058-169 Ecosystem Management (2 cr.)
Explores the role of fire in biotic and abiotic systems. This class builds from the individual to the ecosystem and incorporates human influence.

10-058-171 History & Ecology of Wildfire (3 cr.)
Examines the role of wildland fire and firefighting throughout history to the present.

10-058-172 Basic Dozer & Engine Operation (1 cr.)
Prepares wildland firefighting students for safe vehicle procedures. Fire engines, ATVs and bulldozer/plows will be discussed. Operation of vehicles will occur as time/equipment availability permits.

10-058-173 Fitness Qualification Prep 1 (1 cr.)
Introduces the student to the requirements for the 1.5 mile run, 3 mile pack test and step test which are required by wildland fire hiring agencies.

10-058-174 Fitness Qualification Prep 2 (1 cr.)
Prepares the student for successful completion of the 1.5 mile run, 3 mile pack test and the step test upon being hired by a wildland fire agency.

10-058-175 Wilderness Survival (1 cr.)
Gives wildland firefighters concepts valuable to preserving health in remote firefighting locations.

10-058-176 Live Fire 2 (2 cr.)
Gives students experience in live fire settings, increasing their wildland fire qualifications. Successfully completing a physical test is required for this class. The test may be accomplished through FVTC’s Fitness Center.

10-058-178 Basic Chainsaw and Off Road Vehicle Operation (1 cr.)
Teaches students to operate ATV's safely and efficiently on burn prep, prescribed burns and wildfire suppression.

10-058-179 Fire Experience (3 cr.)
Allows students to gain valuable fire experience for the resume. While not guaranteed, students may be paid for some forest fire suppression duty.
10-058-180 GPS and Map Use in Wildfire (3 cr.)
Gives students a working knowledge of map and technology tools for use in wildfire fire suppression and prescribed burns. Basic GPS operations, public land survey system, topographic and aerial maps are discussed.

10-058-181 Prescribed Fire (1 cr.)
Consists of student participation in prescribed fire application for management and fuel reduction objectives. Emphasis will be on safety, ignition patterns and holding crews.

10-058-182 Fire Prep (1 cr.)
Prepares the student for fire season. Topics include writing burn plans, burn site checks, equipment inventory, organization and maintenance.

10-058-183 Wildfire Suppression (3 cr.)
Utilize hands-on, live fire suppression tactics in conjunction with Wisconsin DNR fire suppression personnel. Prescribed burning duties also possible depending on need and availability.

10-058-184 S270 Basic Air Ops (1 cr.)
Covers aircraft types and capabilities, aviation management and safety for flying in and working with agency aircraft, tactical and logistical uses of aircraft, and requirements for helicopter take-off and landing areas.

10-058-185 S134 & RT130 Annual Refresher (1 cr.)
Compiles two NWCG classes. S-134 is a safety course focusing on personal firefighter safety. RT-130 is the annual fire line safety refresher training required for all firefighters. Topics differ by year based on industry recommendations and identified training needs. Includes annual shelter deployment practice for all participants.

10-058-186 S133/S211/S131 Safety/Pumps/FF1 (2 cr.)
Combines three NWCG classes. S-133 is a fire safety course. S-131 is Firefighter Type 1 training. Sometimes called Squad Boss, these are the entry-level supervisors in wildland firefighting. S-211 consists of three skill areas including supply, delivery and application of water.

080 Farm Operations

31-080-305 Computers, Farm (1 cr.)
Designed to allow students to operate and explore the utilization of computers and computer software for production agriculture application. Computer use and the latest in agricultural software will be emphasized.

31-080-350 Animal Nutrition, Basic (1 cr.)
Acquaints the student with the nutrients essential for livestock growth, production and reproduction. The anatomy and physiology of digestion and absorption are discussed for single stomach and ruminant animals, with the emphasis on dairy cattle.

31-080-351 Agriculture Wiring, Basic (1 cr.)
Prepares learners to understand the components of agricultural wiring systems. The student will be able to read wiring diagrams and perform wire lighting circuits, troubleshoot motors and control circuits.

31-080-352 Plant Growth and Alfalfa Production (1 cr.)
Introduces basic plant growth concepts to Wisconsin forage crops. Management and production practices will be emphasized for alfalfa and related Wisconsin forages.

31-080-353 Soil Principles and Fertilization (1 cr.)
Acquaints the student with the physical, chemical and biological properties of soil in relation to fertility and good soil management. The students will sample soils on their farms and identify fertility needs from the soils test report. Nutrient management will be discussed.

31-080-354 Farm Accounts - Income Tax (1 cr.)
Deals with the set up farm records and accounts in order to file a farm income tax return. The student will become acquainted with the basic Schedule F farm tax form as well as other appropriate forms used in farm income tax completion.

31-080-355 Tractor Maintenance 1 & Engine Systems (1 cr.)
Provides students with the skills to maintain the cooling and lubrication systems on tractors and other agricultural machinery.

31-080-356 Agricultural Building Construction (1 cr.)
Acquaints the student with farm construction skills. This course focuses on the selection of building materials and on the design, cost and placement of farm buildings.

31-080-357 Tractor Maintenance 2 & Electrical Systems (1 cr.)
Prepares students to identify and maintain parts of electrical systems in farm power units. Students will be able to troubleshoot and repair electrical systems.

31-080-359 Agriculture Renewable Energy (1 cr.)
Provides instruction in making, processing and testing renewable energy (biofuels/biodiesel) for agriculture application. Students will operate processing equipment for renewable energy/fuel production. Fuel standards will be covered and tested conducted on produced fuel.
31-080-360 Farm Management Overview (1 cr.)
Focuses on management skills and concepts that beginning producers need to continue farming in today's changing technology. Emphasis is given in establishing and recording farm business records, business and family goals. Entire farming operation is assessed and plans are developed for farm management decisions.

31-080-361 Nutrient Management Principles (1 cr.)
Enables the student to develop, write and manage a nutrient management plan for their farm operation or a selected Wisconsin farm. Components of a plan, laws affecting a plan and completion of a plan are emphasized.

31-080-365 Farm Business Management, Analysis, Finance (1 cr.)
Is a study of business management principles and practices including financing, business analysis, budgeting, capital acquisition, land acquisition and types of business organizations will be discussed in relation to the student's farming operation. Basic farm business analysis will be completed for the individual's farm. Short- and long-range plans will be established for the operation.

31-080-366 Livestock Ration Balancing (1 cr.)
Introduces the student to the mechanics of balancing livestock rations using the National Research Council tables. They will be shown how computers can be used to develop rations. The makeup and functions of the nutrients essential for livestock will be discussed in the preparation of dairy rations for the home herd. A cost analysis of all rations will be completed by students for dairy herds and other livestock enterprises.

31-080-367 Agricultural Marketing (1 cr.)
Covers and analyze the various marketing channels for farm products in this one-credit class. The buying and selling of feed components as well as the marketing of excess dairy cattle and young stock will be discussed. Agricultural organizations which play a part in the agricultural marketing system and acquaint the student with the future's market.

31-080-368 Dairy Cattle Selection (1 cr.)
Enables students to recognize and select dairy cattle according to the true-type picture of various breed associations. The course will stress judging techniques and will acquaint students with dairy cattle classification systems. Aspects of mating and selecting sires to improve various aspects of a dairy cow will be discussed. Field trips will stress cattle selection and herd management.

31-080-369 Corn and Cash Crop Production (1 cr.)
Develop management and production strategies for corn, soybeans, and related grain crops of Wisconsin.

31-080-370 Soil Management and Conservation (1 cr.)
Is designed to inform the student of the sources of fertilizers, the principles of application, soil test analysis, and the economics involved in the use and selection of fertilizers. A conservation plan will be developed for the farm.

31-080-371 Farm Machinery Maintenance, Planting Equip. (1 cr.)
Deals with the various aspects of farm machinery maintenance, including the selection of components and their replacement. Students will maintain and troubleshoot farm machinery, electrical systems, such as monitors, special lighting, and electrical solenoids and controls. Planting equipment will be adjusted, calibrated and selected.

31-080-372 Dairy Cattle Housing, Milking, Waste System (1 cr.)
Studies the various types of housing, milking and waste handling systems available in the area will be discussed. The student will look at long-range plans for the replacement of equipment for the home farm.

31-080-380 Herbicide and Pesticide Application (1 cr.)
Enables the students to become familiar with the equipment used to handle and apply herbicides, pesticides and fertilizer. Both calibration and safety with all types of farm sprayers and applicators are emphasized. Proper chemical selection for crops and basic weed ID will be emphasized.

31-080-381 Dairy Cattle/Young Stock Management (1 cr.)
Covers the use and mechanics of Dairy Herd Improvement Association (DHIA) production records as tools for feeding, culling, breeding and selecting of herd replacement. A young stock management and feeding program will be implemented for the student's farm. This includes feeding, herd health, identification and breeding.

31-080-382 Dairy Herd Health and Reproduction (1 cr.)
Covers the reproductive systems of the dairy animal. The class will cover various herd health problems including mastitis, milk fever and similar common dairy cattle problems. A herd health management and reproductive management program will be developed for the home farm.
31-080-384 Farm Building Ventilation Systems (1 cr.)
Covers planning techniques for farm buildings including the ventilation, insulation and energy factors are stressed. Utilization of existing buildings, alterations, design, materials and production requirements as well as the principles of heating, ventilation and insulation are covered.

31-080-394 Agricultural Hydraulics (1 cr.)
Is designed to give the student a comprehensive knowledge of hydraulic systems and their use on farm equipment. Emphasis is placed on how the systems and components work in addition to how they are designed, operated and serviced.

31-080-395 Welding Repair and Maintenance (1 cr.)
Emphasizes the use of M.I.G., arc and the oxyacetylene welding equipment in the repair and maintenance of farm machinery. The student will learn the basics of each of the systems. The expansion and contraction of metals, removal of bearings, and use of special rods and equipment will be emphasized.

31-080-396 Forage & Grain Harvesting Equipment (1 cr.)
Provides students with a comprehensive knowledge of forage and grain harvesting equipment. Emphasis is on design, operation, adjustments and maintenance of the equipment. Farm machinery management and operational expenses will also be stressed.

090 Farm Business & Production Management

30-090-381 Farm Business, Operating a (3 cr.)
Focuses on management skills and concepts that first-year students need to continue farming in today's changing technology. Emphasis is given in establishing and recording farm business records and family goals. Students will organize and maintain farm business records and analyze them to make sound farm management decisions. Entire farming operation is assessed and plans are developed for future needs and goals. Classes are held throughout the year and include classroom and on-farm instruction.

30-090-382 Soil Management (3 cr.)
Prepare and implement a land use plan, conduct soil testing procedures and interpret reports. This session also emphasizes the analysis of the farm business and planning of cropping strategies. Classes are held throughout the year and include classroom and on-farm instruction.

30-090-383 Crop Management (3 cr.)
Focuses on crop production, management and economics. Specific topics relate to variety, selection, planning, pest control, harvesting, storage, safety and marketing. The farm cropping program is an integral part of the total farm business management plan. Classes are held throughout the year and include classroom and on-farm instruction.

30-090-384 Livestock Nutrition (3 cr.)
Focuses on the skills, techniques and concepts necessary for sound feeding management. Topics include determining feed values, economics of feed, nutritional terminology and requirements, feed consumption of livestock, understanding feed tag labels for protein, energy, minerals and vitamins. Evaluation of base feed and feeding programs, and metabolic disease of lactating livestock. Classes are held throughout the year and include classroom and on-farm instruction.

30-090-385 Livestock/Farmstead Equipment Management (3 cr.)
Includes various phases of selection, breeding, herd health, and the raising and marketing of livestock and livestock products. Students will learn the selection, operation and maintenance of milking, feed, ventilation, manure handling, equipment and farm buildings. Using a business analysis, they will understand how the livestock program is related to the total farm enterprise. Classes are held throughout the year and include classroom and on-farm instruction.

30-090-386 Farm Records and Business Analysis (3 cr.)
Covers the practical use of a farm record system in managing the farm and financial analysis. Topics include the establishment of farm business goals, selection and use of farm credit, farm business arrangements, farm estate planning, and farm income taxes. Use of computers and/or computer records and financial analysis of farm business and finance strategy to meet the students’ needs. Production and financial decisions will be based on students’ farm business analysis. Classes are held throughout the year, and include classroom and on-farm instruction.

101 Accounting

10-101-102 QuickBooks Accounting Applications (1 cr.)
Lays the foundation for students to gain experience using QuickBooks Pro. Students practice creating a company using a chart of accounts, creating vendors and customers, demo payroll, record transactions, and generate and use financial reports. Being familiar with Windows, business experience or completion of an accounting course is helpful.
10-101-103 Peachtree Accounting Applications (1 cr.)
Lays the foundation for students to gain experience using Peachtree. Students practice creating a company using a chart of accounts, creating vendors and customers, record payroll and other transactions, and generate and use financial reports. Being familiar with Windows, business experience or completion of an accounting course is helpful.

10-101-107 Accounting, Principles of (3 cr.)
Introduces basic concepts and general principles of accounting to non-accounting students. Topics include financial statements, merchandising accounting for cash, inventory, payroll, and accounting software.

10-101-126 Integrated Acctg. Systems on Microcomputers (2 cr.)
Explores manual and computerized accounting systems. Students examine the design of the systems and the internal controls necessary to achieve accurate, timely and relevant information. They use a commercial accounting software package to demonstrate proficiency.

10-101-130 Cost Accounting A (2 cr.)
Presents fundamental cost accounting concepts and objectives as well as comprehensive illustrations of the flow of costs in manufacturing systems. The planning and control phases of cost elements (material, labor and factory overhead) are covered in relation to job order and process costing systems. Additional topics include CVP analysis and ABC management.

10-101-131 Cost Accounting B (2 cr.)
A continuation of Cost Accounting A. Students learn about tools for planning and control through budgeting and variance analysis, inventory costing and management using JIT, MRP and back flushing and also understand accounting aspects of department and product costs.

10-101-145 Spreadsheets, Beginning (1 cr.)
Covers developing, constructing and printing basic business-related worksheets and reports using spreadsheet software. Students create, modify and print various charts based on worksheet data.

10-101-150 Income Tax Accounting A (2 cr.)
Studies simple individual federal income tax returns. The course covers income tax withholding and basic reporting requirements, basic income taxes, simplified federal returns, general purpose returns, interest, dividends, business expenses and supplemental income.

10-101-151 Income Tax Accounting B (2 cr.)
Introduces cost recovery and depreciation, itemized deductions, supplemental income activities, capital gains and losses, tax credits and alternative minimum tax, installment sales and withholding. Students examine the tax forms that are appropriate for each topic.

10-101-152 Spreadsheets, Intermediate (1 cr.)
Covers developing and editing business-related worksheets. Students examine various functions such as If, Round, Sum, Average and Pmt. They also use Data Tables, Goal Seek, Scenarios and Solver to assist in decision making.

10-101-155 VITA Tax Assistance (1 cr.)
Provides hands-on experience in preparing state and federal income tax returns for people in the community. Is particularly valuable for students entering the public accounting field.

10-101-160 Communication Software, Intro to (1 cr.)
Introduces Word and PowerPoint using accounting examples and applications. The emphasis is on effective communication using printed documents. The course includes a presentation using accounting materials.

10-101-164 Accounting Database Applications (2 cr.)
Covers the creation of database applications using Excel and Access. It includes the integration and manipulation of data and the creation of reports.

10-101-166 Advanced Software Integration (2 cr.)
Presents the advanced concepts of word processing, spreadsheet, presentation and database software. Students integrate data within the various software and create and present a project.

10-101-180 Financial Accounting 1 (4 cr.)
Prepares students to analyze, record, summarize and interpret accounting information. The course focuses on business transactions, financial statements, merchandising, inventory, special journals, internal controls, receivables, plant assets and payroll.

10-101-181 Financial Accounting 2 (4 cr.)
Presents basic concepts for partnerships and corporations. It introduces bonds, cash flow statement preparation, financial statement analysis, budgeting and job cost procedures. The course includes a practice set using job costing.

10-101-182 Intermediate Accounting 1 (4 cr.)
Reviews accounting and recording processes, temporary investments, cash flows, revenue recognition and financial statement analysis.
10-101-183 Intermediate Accounting 2 (4 cr.)
Focuses on inventory, long-term debt financing, intangible assets, stockholder equity, long-term investments in equity securities, bonds, leases, acquisitions and retirement of operational asset depreciation and depletion.

10-101-187 Payroll Accounting (3 cr.)
Presents payroll calculation and preparation of payroll-related entries. Topics include federal and state laws, calculation and payment of payroll taxes, completion of government forms and journal entries. A computer practice set is included. Proficiency with electronic calculators is recommended.

10-101-188 Cost Accounting, Advanced (3 cr.)
Studies cost implications of management decision models: the cost data provided, the reasons for the models and the control capabilities of the analysis tools. Students also complete an interview project with a cost accountant employed at a local firm.

10-101-189 Income Tax Accounting, Advanced (3 cr.)
Integrates the advanced tax aspects of individual returns with the basic concepts of partnership and corporate returns. Includes tax planning and research as well as an entry-level exposure to tax accounting software.

102 Business Administration

10-102-103 Business Law 1 (3 cr.)
Introduces legal principles and standard business law concepts and their implications for business. It emphasizes contracts, sales, commercial paper, bailment, agency and real property, with references to the Uniform Commercial Code and recent consumer legislation.

10-102-105 Business Management Internship (3 cr.)
Provides on-the-job supervised work experience in various businesses. Weekly in-school seminars emphasize career-related topics. Each student completes a minimum of 216 hours working as an intern. Completion of a minimum of 34 program credits is highly recommended.

10-102-112 Business, Introduction to (3 cr.)
Provides an overview of the variety of activities in the world of business. It focuses on the responsibilities connected with operating a business from both organizational and managerial viewpoints. It also examines the role of government in business.

10-102-157 Business Law 2 (3 cr.)
Discusses employment, business organizations, ethics, computer law and insurance.

103 Computer Software

10-103-100 MS Word 2007 Introduction (1 cr.)
Presents the basic features of MS Word 2007. Learners create, edit, and save documents, format characters, paragraphs, pages and documents, manage documents, insert objects, create tables and SmartArt, and merge documents.

10-103-102 QuickBooks (1 cr.)
Provides students with experience in using the QuickBooks accounting software package. Students learn how to use the software and create a chart of accounts and enter various business transactions. Through these hands-on experiences, students should be able to convert their knowledge to any other software package as needed.

10-103-104 MS PowerPoint 2007 Introduction (1 cr.)
Learn the features of Microsoft PowerPoint 2007. Create, edit and animate presentations; work with graphics, lines, fill and colors; and modify and enhance PowerPoint slide shows to create appealing presentations.

10-103-120 MS Office Suite, Introduction (2 cr.)
Focuses on beginning computer concepts, Windows operating system, Internet Explorer, Word, Excel, Access, PowerPoint, and the basic integration of the various components of the Microsoft Office Suite application.

10-103-140 MS Word 2010 Introduction (1 cr.)
Presents the basic features of Microsoft Word. Learners create, edit, and save documents, format characters, paragraphs, pages and documents, and apply special features when formatting.

10-103-142 MS PowerPoint 2010 Introduction (1 cr.)
Presents the basic features of Microsoft PowerPoint. Learners create, edit and animate presentations, work with tables, charts, graphics, and custom shows, and learn to integrate, share and protect presentations.

10-103-143 MS Access 2010 Introduction (1 cr.)
Presents the basic features of Microsoft Access. Learners enter and edit data in tables, create and apply queries, produce reports and forms, import and export data, and integrate Access data with other programs.

10-103-145 MS Excel 2010 Introduction (1 cr.)
Presents basic features of Microsoft Excel. Learners develop basic skills to create, edit, and format worksheets; use functions; set print options; add visual elements; work with multiple worksheets, tables, and other file formats; and integration with Word.
10-103-171 MS Excel 2007 Introduction (1 cr.)
Presents basic features of Microsoft Excel 2007. Learners develop basic skills to create and edit worksheets; work with clip art; and create formulas, charts, drawing objects, and hyperlinks.

10-103-173 Dreamweaver, Introduction to (1 cr.)
Introduces the basic functions of Macromedia Dreamweaver. Learn how to navigate Dreamweaver as well as create, format and modify simple Web pages.

10-103-174 Photoshop, Introduction to (1 cr.)
Introduces the student to basic concepts of using Photoshop which is digital image editing software. Learn how to enhance photographs, create digital images using the draw and text features, crop images and repair damaged photos.

104 Marketing

10-104-100 Internet Marketing (3 cr.)
Introduces Internet marketing principles, best practices for digital and interactive marketing, and online marketing strategies. With a focus on Web site development and analysis, students gain an understanding and appreciation of the importance and relevance of the Internet/Web as a marketing tool in the increasingly competitive marketplace.

10-104-110 DECA Leadership (1 cr.)
Helps students to develop their leadership skills through participating in local, state and national Delta Epsilon Chi (DECA) activities. DECA is a national organization for college students preparing for careers in marketing, merchandizing or management.

10-104-113 Marketing Research (3 cr.)
Focuses on the skills and techniques necessary to conduct basic marketing research. It covers problem definitions, planning studies, use of secondary data, questionnaire design and development, instrument administration, and data collection and interpretation.

10-104-114 Marketing Management (3 cr.)
An advanced marketing course that instructs students in creative decision making relative to the marketing mix, channels of distribution and industrial and international marketing. Emphasizes the development, organization, implementation and control of the marketing plan.

10-104-120 Advertising/Copywrite/Layout (3 cr.)
Designed as an intermediate, skills-oriented class in the creative arts of developing advertising strategy and creative follow-through. Develops skills in copywriting and proofreading, design principles, basic production terminology and methods, preparation of finished layouts and comprehensives, typography and advertising markup. Involves color separations and photography and uses case studies to simulate the concept development phase of advertising creativity.

10-104-121 Marketing Communications Development (3 cr.)
Focuses on creative marketing strategy, problem solving, and execution of creative materials in print, broadcast and online media. Practice and applications in marketing creativity and imagination is demonstrated through copywriting, art direction, and use of computer application software for print, broadcast and digital marketing communications. Non-media creative applications are also developed for direct mail, sales letters, public relations writing, collateral materials and sales promotion.

10-104-124 Sales Workshop, Advanced (3 cr.)
Focuses on advanced concepts of industrial and services selling with actual application of the selling process. Emphasizes hands-on selling by using videotape analysis and small group interaction. Develops skills in time management, self-motivation and territorial organization.

10-104-130 Marketing - Field Study (3 cr.)
An advanced course that includes developing a research paper relating to a marketing topic or career of interest, an industry analysis, or an investigation of a firm’s business and marketing environment.

10-104-134 Marketing - Internship 2 (2 cr.)
Provides students with practical work experience in an area directly related to their career. Internship work is supervised and evaluated. Students work approximately 8-12 hours per week.

10-104-147 Promotion Principles (3 cr.)
Examines the theory, practice and management of advertising. Uses a comprehensive advertising project to simulate the decisions and practices made in the real environment. Topics include the development of an advertising plan, selecting the media, budgeting, and the relationship of advertising to the marketing problem and the marketing mix.
10-104-150 Marketing - Internship 1 (1 cr.)
Allows students to learn in a structured employment situation under the supervision of a sponsoring business and a coordinating instructor. It provides students with practical work experience in an area directly related to their career major. This program requires students to work a minimum of eight hours per week and to attend a seminar one hour a week. Department consent required.

10-104-151 Marketing 1, Principles of (3 cr.)
Introduces modern marketing practices. The course examines the role played by marketing in society and covers consumer motivation, market segmentation, product development, advertising and channels of distribution.

10-104-157 Retail Principles (3 cr.)
Develops the skills and knowledge necessary for entry into a mid-management position in retailing. The course analyzes the role and development of retailing, buying and selling, personnel, store location and layout, sales promotion and financial control.

10-104-163 Sales Management (3 cr.)
Gives a detailed look at the position of sales manager as an organizer, administrator and decision maker. Emphasizes the decision-making processes used in sales management.

10-104-166 Sales Principles (3 cr.)
Examines the basic concepts and principles of sales as they apply to retailing. It includes wholesaling and industrial selling, the function of selling in business and living, careers in personal selling, requirements and rewards, buying motives, product knowledge, prospecting and approach, product presentation, sale closing, account servicing and handling objections.

10-104-170 Contact Center Careers (1 cr.)
Provides an opportunity to research the Call Center field. Encourages the development of a personal growth plan for continuous lifelong learning in the areas of coaching/mentoring, quality monitoring and data reviews.

10-104-171 Contact Center Computer Operations (2 cr.)
Focuses on how to operate the e-mail system, mainframes, navigate the Internet and the Intranet, and utilize the basic office equipment used in most Call Centers.

10-104-172 The Call Process (1 cr.)
Focuses on the call process used in Call Centers. Includes opening a call, managing a call, and closing a call and also stresses the use of interpersonal skills.

10-104-175 Phone Etiquette and Equipment (2 cr.)
Introduces the skills needed to operate the phone equipment in the Contact Center. Students learn how to log in and log out, utilize the correct status/code and navigate the phone features.

10-104-176 Contact Center Technical Skills (2 cr.)
Provides the skills needed to balance customer and business needs. Explores ways to demonstrate product knowledge, determine resources while following company processes.

10-104-177 Contact Center Self-Management Skills (1 cr.)
Provides the tools needed to demonstrate time management skills, organizational skills and adaptation to physical environment skills while adhering to center goals.

10-104-178 Contact Center Field Study (1 cr.)
Allows research into options in the varied types of Contact Centers. Provides students with job shadowing and practical work experience in a contact center.

10-104-182 Data Base Marketing (3 cr.)
Applies analytical processes to relevant marketing information and reporting systems currently used in business and industry. It focuses on the technical skills needed to develop and use database marketing techniques. Analytical and quantitative applications are emphasized as they relate to statistical measurements.

10-104-191 Customer Service (1 cr.)
Focuses on developing skills and attitudes, the importance of the customer and satisfying his/her needs, learning keys to effective customer service, handling problem situations, and retention strategies related to customer service.
105 Related Business

10-105-100 Pre-Internship Seminar (1 cr.)
Prepares the learner for the business internship experience. Students learn to develop resumes and interview skills appropriate for positions specific to their industry.

10-105-102 Business Internship 2 (2 cr.)
Provides students with 144 hours of practical work experience in an area directly related to their career. Internship work is supervised and evaluated.

10-105-110A Business Internship (1 cr.)
Allows students to learn in a structured employment situation under the supervision of a sponsoring business firm and a coordinating instructor. It provides students with work experience in an area related to their career major and requires working a minimum of four hours per week throughout the internship. Department consent required.

106 Business Systems/Technology

10-106-101 Web Technologies (2 cr.)
Provides a basic understanding of the Web as well as the tools used to create Web pages, blogs and other features. Reviews social and business Web tools and components.

10-106-102 Office Desktop Publishing: MS Publisher (1 cr.)
Develops skills for working with different types of office documents such as brochures, newsletters and reports. It introduces page layout, graphics and styles and fonts as well as the creation of letterheads, borders and logos.

10-106-103 Intro to Administrative Professional Careers (1 cr.)
Introduces various aspects of administrative professional careers. Explores a variety of topics including career expectations, future employment opportunities and current employment trends.

10-106-104 Business Technology Capstone (1 cr.)
Designed as a capstone conclusion to the Administrative Professional program. Students complete cumulative projects demonstrating their understanding and application of the Administrative Professional program outcomes. Students also prepare for an off-site internship experience.

10-106-107 Keyboarding for PC Users (1 cr.)
Introduces keying by touch. It emphasizes control of the alphabetic keys and the numeric keypad. Practice drills to improve keying skills are included.

10-106-108 Business Writing and Formatting (3 cr.)
Focuses on development of spelling, grammar, punctuation and formatting rules as applied to business documents in both print and digital mediums.

10-106-109 Emerging Business Trends and Technologies (2 cr.)
Provides students with opportunity to research and analyze current and emerging trends and technologies in business. Focuses on organizational trends and technologies as well as individualized trends and technologies.

10-106-112 Keyboarding Speed Development (1 cr.)
Focuses on improving typing speed and accuracy through the use of skill-building software.

10-106-115 Document Management (3 cr.)
Emphasizes the principles of document creation and management. Students gain experience in creating, formatting, editing, proofreading and managing the document life cycle.

10-106-116 Business Writing (2 cr.)
Review spelling, grammar, language and punctuation rules as applied to composing business documents in both print and electronic mediums.

10-106-117 Legal Terminology (2 cr.)
Covers the many specialized areas of law and terms dealing with the legal system. It emphasizes the correct spelling, pronunciation and definition of legal terms. A minimum keying speed of 35 wpm is recommended.

10-106-118 Effective Business Practice (3 cr.)
Provides hands-on experience and practice using a variety of business communication techniques providing students with knowledge, poise, tact and the skills to conduct themselves in the business world with confidence. Included in the course is The Seven Habits of Highly Effective People developed by Stephen Covey.

10-106-119 Electronic Calculators (1 cr.)
Covers all phases of machine calculation with the fundamentals applied to business applications. Students work with a printing/display electronic calculator. The course is self-paced and emphasizes speed and accuracy.

10-106-120 Business Technology Essentials (2 cr.)
Introduces computers and information processing including terminology, hardware, software, networks, Internet, security and the computer marketplace. Major topics include how to effectively browse the Internet and use Microsoft Outlook’s electronic mail, calendar, contacts, tasks and journal folders.
10-106-121 Office Software Applications (3 cr.)
Presents introductory applications using MS Word, MS Excel and MS PowerPoint. Learners create, edit and save files; work with clipart; format document files; create formulas; add animation and transitions; embed and insert objects; use SmartArt; and create hyperlinks.

10-106-123 Meeting Management Internship (2 cr.)
Provides both theoretical and hands-on experience planning, setting up and managing a meeting or event. Emphasis is on developing and implementing proper procedures to ensure professional results. Weekly seminars emphasize career-related topics.

10-106-126 Administrative Management (3 cr.)
Focuses on the development of administrative management skills, with emphasis in the areas of supervision, managing performance and development of staff, budget management, negotiation skill development, salary/benefits administration, problem solving and team building, and conflict resolution.

10-106-128 Advanced Office Software Applications (3 cr.)
Focuses on advanced features and applications of the Microsoft Office Suite. Students will apply advanced software features to the successful completion of business-related projects and scenarios.

10-106-133 The Practical Internet (1 cr.)
Explore the basics of how to use the Internet as an office tool. Topics covered in the course include basic Internet connectivity; overview of Internet browsers; how to search for information using the World Wide Web; and the basic principles of conducting business online, e-mailing, instant messaging and handling photos.

10-106-134 Technological Resource Management (3 cr.)
Focuses on acquisition, maintenance and replacement of technological resources. Examines the need for resource identification and allocation, problem identification, and resolution related to business technologies.

10-106-137 Project Management for the Office (1 cr.)
Familiarizes students with software used to manage stand-alone projects as well as planning and tracking collaborative projects using MS Project.

10-106-140 Meeting & Event Management Fundamentals (3 cr.)
Focuses on planning a successful meeting/event. Topics include conducting the planning activities, managing the finances, promoting the meeting/event, facilitating the on-site needs, analyzing contracts, arranging travel and transportation needs, and conducting follow-up activities while communicating effectively with all stakeholders.

10-106-141 Information Processing - Legal (3 cr.)
Covers various computerized methods used to open new client files; and organizing and maintaining documentation necessary for computerized litigation, document creation, and law office administration.

10-106-152 Office Internship (2 cr.)
Provides on-the-job supervised office work experience in various businesses. Weekly in-school seminars emphasize career-related topics. Each student completes a minimum of 144 hours working as an intern.

10-106-153 Realtime Reporting Speed Development (2 cr.)
Develop skills acquired in Realtime Reporting II on literacy, jury charge, and testimony material beginning at 120 wpm. Scheduled during the summer term, students must pass three 3-minute timings in two of these categories.

10-106-154 Literary I (2 cr.)
Learn to write literary material dictated at a minimum speed of 140 wpm for 5 minutes and transcribe at least 3 timings with a minimum of 95 percent accuracy and prepare salable transcripts.

10-106-155 Jury Charge I (2 cr.)
Learn to write jury charge material dictated at a minimum speed of 150 wpm for 5 minutes and transcribe at least 3 timings with a minimum of 95 percent accuracy and prepare salable transcripts.

10-106-156 Medical Reporting & Terminology (2 cr.)
Learn to write medical terminology in machine shorthand from material dictated at a minimum speed of 120 wpm for 5 minutes with a minimum of 95 percent accuracy; research medical information, and prepare salable transcripts.

10-106-158 Realtime Reporting Technology (2 cr.)
Use computer aided transcription and realtime software; build dictionaries; read, translate, and edit transcripts, and review realtime translation procedures in court, depositions, captioning, and educational environments.
10-106-160 Business Relationship Development (2 cr.)
Provides students with opportunity to develop and analyze networking and business relationships. Includes examination of the networking process, tools to facilitate and enhance networking opportunities and networking communication development.

10-106-162 Testimony I (3 cr.)
Learn to write two-voice testimony at 150 wpm for 5 minutes and transcribe with a minimum of 95 percent accuracy. Concurrent registration in Testimony I Lab at the student's campus is required.

10-106-164 Publication Design (3 cr.)
Introduces basic design principles related to business publications. Includes examination and use of technology tools most commonly used for publications in a business office.

10-106-165 Literary II (2 cr.)
Learn to write literary material dictated at a minimum speed of 180 wpm for 5 minutes and transcribe at least 3 timings with a minimum of 95 percent accuracy and prepare salable transcripts.

10-106-166 Office Fundamentals (3 cr.)
Focuses on the development of fundamental office skills. Students will gain skill in general office duties, records retention and maintenance, application of office technologies, verbal and written communication, and customer service.

10-106-167 Jury Charge II (2 cr.)
Expand the learner’s ability to write jury charge material dictated at a minimum speed of 200 wpm for 5 minutes and transcribe at least 3 timings with a minimum of 95 percent accuracy, write and read back current events dictation, and prepare salable transcripts.

10-106-168 Judicial Reporting Procedures (2 cr.)
Introduces the learner to judicial reporting procedures for which reporters are responsible in the courtroom, deposition, and realtime reporting environments, including preparing salable transcripts, researching legal citations, and developing professional development plans.

10-106-169 Judicial Reporting Internship (1 cr.)
Learn to write machine shorthand verbatim for a minimum of 45 hours of actual writing time in the courtroom, classroom, and deposition environment under the supervision of a working reporter, transcribe a minimum of 80 salable transcript pages, prepare a resume and cover letter for a judicial reporting position; and pass a mock RPR written knowledge test.

10-106-171 Testimony II (3 cr.)
Learn to write a two-voice testimony at 225 wpm and transcribe with 95 percent accuracy a minimum of three 5-minute, two-voice timings at 225 wpm. Concurrent registration in Testimony II Lab at the student’s campus is required.

10-106-174 Realtime Reporting I (5 cr.)
Learn to use machine shorthand to write consonants, vowels, numbers, multi-syllabic words, multi-consonant words, punctuation and special symbols, short forms and phrases, words in their singular and plural forms, and prefixes and suffixes. Concurrent registration in Realtime Reporting I Lab at student’s campus is required.

10-106-175 Realtime Reporting II (5 cr.)
Learn to write multi-syllabic words; punctuation and special symbols, short forms and phrases, prefixes and suffixes; numbers, frequently used words and phrases, contractions using the Z-rule, the Flagged Alphabet, apply realtime conflict elimination principles, apply realtime theory and write dictation using a realtime theory. Concurrent registration in Realtime Reporting II Lab at the student's campus is required.

10-106-178 Presentation and Training Techniques (3 cr.)
Develops the skills necessary to prepare, support and facilitate business presentations and training programs.

10-106-180 Meeting & Event Management, Adv. Apps (3 cr.)
Learn to create, market, plan and implement incentive programs and special events. Apply creativity to develop events with unique purposes and presentations combining elements such as site selection, decor, lighting, sound and entertainment as well as food and beverage to reflect the theme of the event.

10-106-182 Event Planning-Global (2 cr.)
Learn about various cultures and their business customs. Focus will be on how these customs may impact planning business events and how to plan successful business events that are sensitive to all cultures involved.

10-106-183 Practical Office Software (1 cr.)
Explore how to use Microsoft Office software in the office. Focus will be on basic features and concepts associated with the software.

10-106-184 English for Realtime Reporters (1 cr.)
Enhances the learner's ability to use proper English grammar, spelling, punctuation, capitalization, and vocabulary techniques in the transcription of the spoken word.
10-106-194 Office - Internship 1 (1 cr.)
Provides on-the-job supervised office work experience in various businesses. Weekly in-school seminars emphasize career-related topics. Each student must complete a minimum of 72 work hours. In-school seminars waived if already completed as part of the 10-106-152 Office Internship course.

10-106-195 Realtime Reporting Orientation (1 cr.)
Learn to execute laptop computer functions, create electronic files, send documents electronically, develop a time management plan, assess personal skills and characteristics, evaluate the requirements for occupations within the career field, and state the requirements to become a Certified Realtime Reporter and a Registered Professional Reporter.

10-106-804 Realtime Reporting I Lab (1 cr.)
Focuses on the use of machine shorthand to write consonants, vowels, numbers, multi-syllabic words, multi-consonant words, punctuation and special symbols, short forms and phrases, words in their singular and plural forms, and prefixes and suffixes.

10-106-805 Realtime Reporting II Lab (1 cr.)
Learn to write multi-syllabic words; punctuation and special symbols, short forms and phrases, prefixes and suffixes; numbers, frequently used words and phrases, contractions using the Z-rule, the Flagged Alphabet, apply realtime conflict elimination principles, apply realtime theory and write dictation using a realtime theory. Concurrent registration in Realtime Reporting II is required.

10-106-809 Literary I Lab (1 cr.)
Expands the student's ability to write literary material dictated at a speed of 150 words per minute for three minutes and transcribe at least three timings with a minimum of 95 percent accuracy. Concurrent registration in Literary I is required.

10-106-811 Literary II Lab (1 cr.)
Expand your ability to write literary material at 180 words per minute for five minutes and transcribe at least three timings with 95 percent accuracy. Concurrent enrollment in Literary II is required.

10-106-828 Jury Charge I Lab (1 cr.)
Expands the student's ability to write jury charge material dictated at a speed of 160 words per minute for three minutes and transcribe at least three timings with a minimum of 95 percent accuracy. Concurrent registration in Jury Charge I is required.

10-106-829 Jury Charge II Lab (1 cr.)
Expand your ability to write jury charge material at 200 words per minute for five minutes and transcribe at least three timings with 95 percent accuracy. Concurrent enrollment in Jury Charge II is required.

10-106-857 Testimony II Lab (1 cr.)
Expands the student's ability to write two-voice testimony at 225 wpm and to transcribe with 95 percent accuracy a minimum of three five-minute, two-voice timings at 225 wpm. Concurrent registration in Testimony II is required.

10-106-859 Testimony I Lab (1 cr.)
Expands the learner's ability to write two-voice testimony at 160 words per minute for three minutes and transcribe at least three timings with a minimum of 95 percent accuracy. Concurrent registration in Testimony I is required.

31-106-306 Medical Office Procedures (3 cr.)
Emphasizes the principles of medical office procedures. Students gain experience in understanding medical law and ethics, utilizing effective oral and written communications, as well as managing medical office procedures including appointment scheduling, patient reception and registration, medical records and billing, health insurance, business operations, human resource functions and financial management. Students also gain knowledge in locating and obtaining a position in a medical office.

107 Information Technology

10-107-110 Career Skills for IT Professionals (2 cr.)
Examines and identifies job-seeking, job-keeping and interviewing techniques, strategies for identifying and meeting external and internal customer needs as well as good listening skills and techniques for dealing with difficult customers. Also covers time management, team dynamics, continual improvement processes and global business practices.

10-107-113 Information Technology Internship 1 (1 cr.)
A program which allows the student to learn in structured employment situations under the supervision of a sponsoring business firm and a coordinating instructor. Is designed to provide students with practical work experience in an area directly related to their career major. Requires working a minimum of four hours per week per week throughout the internship assignment. Also includes attendance at a regularly scheduled discussion seminar one hour a week. Second-year standing required.
10-107-114 Information Technology Internship 2 (2 cr.)
A program which allows the student to learn in structured employment situations under the supervision of an approved sponsoring business firm. Is designed to provide students with practical work experience in an area directly related to their career major. Requires working a minimum of eight hours per week throughout the internship assignment. Second-year standing required.

10-107-120 Windows Basics (1 cr.)
Focuses on helping students to improve PC working skills and to understand the tasks an operating system performs. The current Windows Operating System is used to teach concepts and skills. Topics include Windows basics, navigation and file management skills, customizing the Windows working environment, using the Search function, and disk maintenance utilities.

10-107-137 Business Information Technology Tools (2 cr.)
Introduces advanced concepts in word processing, spreadsheet, database and presentation software along with integration of these applications. Database concepts are covered including the design, creation and use of simple Access databases. Research strategies for the Internet are also covered.

10-107-150 Microcomputer Applications (2 cr.)
Designed for students with little or no hands-on computer experience. Presents the basic functions of the Windows operating system and how to use the word processing, spreadsheet and presentation functions of Microsoft Office software. Students will integrate various functions of several Microsoft packages.

10-107-158 Systems Analysis (3 cr.)
Introduces the principles and techniques of modern system analysis and design. It explores the fundamentals of traditional systems and methodologies, data flow diagrams and case tools. It also tracks the systems' development life cycle and explains the various stages.

10-107-184 IT Concepts (2 cr.)
Provides students with a foundation in information technology and the use of information systems in today’s business environment. Students explore fundamental computer concepts and terminology of the World Wide Web, e-mail, emerging technologies, hardware and software components and devices, programming languages, network basics, operating systems, and ethics.

10-107-186 IT Career Skills (3 cr.)
Introduces students to the process and development of a plan for securing employment in the Information Technology field. Topics include job search strategies, resumes, cover letters, interviewing and networking. Students will learn business skills to maintain professionalism in many areas including customer service, technical writing, presentations, teamwork, quality and diversity.

10-107-187 IT Career Exploration (1 cr.)
Acquaints students with career options and related job skills, salaries and employment trends in the information technology field. Familiarizes them with the IT program degrees offered at Fox Valley Technical College.

10-107-197 Directed Student Project (1 cr.)
Identify a software package, hardware product or computer-based process to master independently. Develop and implement learning plans and present results to student peers. Weekly portfolio workshops address current topics in computing and business. Instructor consent is required.

109 Hotel & Restaurant Mgt

10-109-101 Risk Management & Crisis Planning (3 cr.)
Addresses security issues such as V.I.P. protection, kidnapping, hijacking, bombing and burglary. Included in crisis management issues are health, computer data loss, staff resignations, natural disasters, strikes, liquor liability and speaker cancellation/no show.

10-109-102 Transportation, Registration and Housing (2 cr.)
Identify the meeting audience location and understand technological abilities to best assess the location for a meeting and the type of registration to be used. Learn to identify and make informed decisions that allow attendees a seamless meeting experience.

10-109-103 Hospitality Law and Liability (3 cr.)
Introduces legal principles together with standard business law concepts and emphasizes their implications for the hospitality and tourism industry. Among the topics covered are contracts, torts and negligence, hotel/guest relationships, Americans with Disabilities Act, food service and employment laws, and consumer protection. Case studies involving the basic principles of law are used to assist in developing judgment in these areas.
10-109-107 Partnership Development (2 cr.)
Learn how to analyze a meeting to identify sponsorship and fundraising opportunities. These partnerships build support for a meeting, increase marketing effectiveness and increase meeting profitability.

10-109-108 Meetings Industry Budget & Financial Mgmt (3 cr.)
Establishing a realistic and sound budget is vital to creation of successful meetings. This course examines the steps in developing a meeting budget. Students learn techniques for projecting and managing budgets including per person methodology and break-even analysis. Emphasis is on situations oriented to the meeting industry.

10-109-111 Room Operations (3 cr.)
Introduces the functions of the housekeeping and front desk departments and their interdependency.

10-109-112 Exposition Management (2 cr.)
Provides the student with an understanding of the growing role of trade shows as a source of revenue for the sponsor as well as an opportunity for buyers and sellers to interact face-to-face in an educational environment. Students create a request for proposal, identify contractors necessary for producing the show, and learn how to effectively interact and communicate with exhibitors throughout the process.

10-109-113 Hospitality - Internship 1 (2 cr.)
Allows the student to investigate and learn through structured, hands-on experiences in the hospitality/tourism industry.

10-109-114 Hospitality - Internship 2 (2 cr.)
Provides the student an additional opportunity to investigate and learn through structured, hands-on experiences in the hospitality/tourism industry.

10-109-115 Hospitality - Internship 3 (2 cr.)
Provides the student with an additional opportunity to investigate and learn through structured, hands-on experiences in the hospitality/tourism industry.

10-109-116 Meeting and Event Contract Development (3 cr.)
Focuses on the development of valid contracts for the meeting and event planning industry. Concepts include contract components, validity, clauses and advanced concepts.

10-109-119 Hospitality Security (2 cr.)
Focuses on the need to provide a safe and secure environment for customers and employees. Areas of study include physical security, internal security, protection of funds, emergency management and guest room security.

10-109-121 Hospitality, Introduction to (2 cr.)
Introduces the various facets of the hospitality industry, including lodging, food service, and tourist attractions. Students explore potential internship and career opportunities.

10-109-125 Hospitality Sales and Promotion 1 (2 cr.)
Covers sales and promotion in the hospitality industry. The emphasis is on promoting hospitality entities to attract new customers, selling principles and merchandising techniques for products and services, and innovative ways to maintain the interest of existing customers.

10-109-126 Customer Service Management (3 cr.)
Helps students to understand, apply and manage the principles of good customer service in a variety of hospitality environments. Particular attention will be given to the various roles and responsibilities of hospitality employees as they relate to customer service.

10-109-131 Tourism: A Community Approach (3 cr.)
Focuses on the opportunities and advantages of approaching tourism from a community viewpoint. Students study the economic, employment and environmental impact of tourism on the quality of life experienced by a community.

10-109-140 Principles of Group Sales (2 cr.)
Provides a thorough understanding of the principles, practices and importance of group sales in the hospitality and tourism industry. Comparisons and contrasts will be examined between the functions of in-house marketing departments, convention and visitor’s bureaus, chambers of commerce and municipality-based entities.

10-109-150 Issues in Hospitality (2 cr.)
Explores existing and emerging issues that affect the hospitality and tourism industries. The course culminates with the planning and hosting of an interactive seminar with businesses.

10-109-151 Resort Management (2 cr.)
Introduces the learner to a wide range of subjects that are unique to resort operations. Included in this study are activities and exercises designed to help the learner differentiate between lodging and resort properties. Exploring the different types of resorts and destinations focusing on special features, activities and amenities of each type of resort will also be included.
110 Paralegal

10-110-101 Introduction to Paralegalism & Legal Ethics (3 cr.)
Provides students with an introduction to the legal profession, court system, legal ethics, legal terminology, research, law office management concepts and procedures, and the role of paralegals.

10-110-102 Civil Litigation I (3 cr.)
Outlines the initial stages of civil litigation, including initial client contact, investigation, pleadings, and motions.

10-110-103 Civil Litigation II (3 cr.)
Is a continuation of civil litigation procedure including discovery, trial and appellate procedure.

10-110-104 Legal Research (3 cr.)
Focuses on the application of legal research techniques using traditional and computer-assisted resources and federal and state materials.

10-110-105 Legal Writing (3 cr.)
Is an advanced writing course that covers various internal and external legal documents.

10-110-106 Family Law (3 cr.)
Familiarizes the student with basic legal concepts involved in the area of family relations. Primary emphasis is in the field of divorce. Additional topics include children in need of protection and services, termination of parental rights, adoption, guardianship, and court procedures relating to family law.

10-110-107 Legal Aspects/Business Organizations (3 cr.)
Focus is on the formation, operations, and dissolution of types of business organizations, and substantive and procedural law involving business organizations.

10-110-110 Real Estate Law (3 cr.)
Focus is on the law of real property, forms of ownership, land description methods, public and private encumbrances, real estate contracts, deeds, financing sources, title evidence, and the closing process.

10-110-114 Administration of Estates (3 cr.)
Is an in-depth course dealing with wills, trusts, estates, and probate. Identifies techniques for fact gathering, income and death tax principles, use of trusts, probate, and administration of terms of wills.

10-110-115 Administrative Law (3 cr.)
Learn the skills to summarize the administrative legal process including the creation and interpretation of administrative rules and regulations, as well as the adjudication of administrative law cases, with emphasis on Workers Compensation and Social Security Disability Law.

10-110-122 Creditor/Debtor Relations (3 cr.)
Focus is on the legal rights of creditors and debtors, collection of outstanding debts, execution of judgments, small claims court, bankruptcy procedures, and filing bankruptcy petitions and schedules.

10-110-142 Paralegal Internship (3 cr.)
Perform duties of a paralegal; seek/obtain employment; apply skills in a workplace; perform legal research/writing; and understand law office systems/administration. Students must seek/obtain an internship position for a minimum of 140 hours in a legal environment under the supervision of an attorney or other qualified professional, completing an internship agreement/learning contract, maintaining a work log and obtain approval from the instructor.

10-110-160 Employment Law (3 cr.)
Analyze federal and state laws governing employment relationships, job discrimination, sexual harassment, work place privacy, labor standards, and human resource management.

10-110-168 Paralegal Criminal Procedures (3 cr.)
Focus is on substantive and procedural criminal law, the role of paralegals in both the prosecution and defense of criminal actions, with emphasis on investigations and preparation of legal documents.

10-110-169 Indian Law (3 cr.)
Covers Wisconsin Indians, tribal sovereignty, federal/Indian relations, tribal governments, tribal courts, treaty making, removal/reservation life, assimilation, reorganization, termination, self-determination, gaming and other contemporary issues.

114 Finance

10-114-104 Financial Institutions (3 cr.)
Examines a balanced view of the United States financial system. Includes an understanding of all financial institutions, financial markets and financial instruments. Introduces the operation, mechanics and structure of the financial system.
Course Descriptions

10-114-108 Foundations in Financial Planning (2 cr.)
Covers the basic elements of the financial planning process and the fundamental concepts and terminology used throughout the financial services industry. It is offered in affiliation with the College of Financial Planning.

10-114-110 Financial Institutions Management (3 cr.)
Presents new trends emerging in the philosophy and practice of financial institutions management. Application of the principles outlined provides new and experienced bankers with a working knowledge of bank management. Illustrative cases are used to enhance learning.

10-114-113 Financial Products and Services, Principles (3 cr.)
Covers financial institutions that offer a broad spectrum of products and services to government, businesses and individuals. It examines current financial products and services and gives insight into developing and promoting new products and services to meet customer needs.

10-114-115 Credit Procedures (3 cr.)
Covers consumer and commercial credit management. It focuses on what the seller must know and do when using credit selling to produce maximum sales with minimum losses. Topics include types of credit, investigation and evaluation of risk, sources of information, decision making, and collection policies and practices.

10-114-121 Analyzing Financial Statements (2 cr.)
Examines the basic skills of financial analysis to the prospective lender credit analyst.

10-114-124 Money and Banking (3 cr.)
Provides a study of money and its creation, monetary systems, the operation of the Federal Reserve System, commercial banking systems and international monetary problems. It also examines the factors that determine the value of money and the operation of the banking system in relation to price level, employment, savings and investment, and economic activity.

10-114-175 Financial Planning (3 cr.)
Approaches planning from the perspective of an individual who applies specific financial concepts and principles to setting financial goals, choosing a career, budgeting and cash flow management. Topics include credit, income taxes, asset protection, investments, retirement and estate planning.

10-114-176 Stock and Bond Investments (3 cr.)
Provides an overview of the problems of investing; the stock, bond and mutual fund investment vehicles available; and the markets in which investments are traded.

138 International Trade

10-138-140 Managing Cross-Cultural Relationships (1 cr.)
Designed to provide an understanding and appreciation of culture, in order to improve cross-cultural interpersonal interactions and communications with people from other countries. Students will learn about the many components of culture, discuss several specific cultural profiles and develop skills to build successful professional and business relationships.

10-138-140DE Managing Cross-Cultural Relationships (1 cr.)
Designed to provide an understanding and appreciation of culture, in order to improve cross-cultural interpersonal interactions and communications with people from other countries. Students will learn about the many components of culture, discuss several specific cultural profiles and develop skills to build successful professional and business relationships.

10-138-150 Global Business Fundamentals (3 cr.)
Provides the opportunity to develop the knowledge, skills and understanding of global business foundations, global business environments, organizing and managing global business, marketing in a global economy and global financial management.

10-138-151DE Certified Global Business Professional (CGBP) Overview (1 cr.)
Review previous CGBP seminars including content covered and related to preparation to the NASBITE CGBP exam. Test preparedness and test strategies will also be discussed. Participants will review and take practice exam.

10-138-152DE Global Sales, Marketing & Product Promotion (1 cr.)
Learn about international customer expectations and cultural requirements. Explore implementation of global market plan; market research, strategy and product liability implications. Review budgeting process and report requirements related to global activities.

10-138-153DE Global Operations Management (1 cr.)
Learn global business planning techniques including developing mission statement; cross cultural communication; legal and regulatory compliance issues. Gain a practical understanding of strategic and operational functions of the international aspects of business. Learn global sourcing options.
10-138-166DE Global Supply Chain & Logistics Management (1 cr.)
Explore strategies and gain insight into building a solid international supply chain. Learn factors that affect transportation modes; product classification, trade agreements, safety issues and key information regarding regulatory requirements.

10-138-181DE Global Trade, Finance & Banking (1 cr.)
Discuss methods of payment, associated costs, foreign exchange. Focus on benefits and drawbacks of each, while understanding impact of customer’s compliance, logistics and documentation processing; process and management of import, export and letters of credit. Explore Letter of Credit cycle i.e. preparation, examination of documents and payment process.

140 Global Education

10-140-110 Spanish 1 for Professionals (2 cr.)
Presents an introductory approach to conversation using everyday work and social situations. This course provides students with the basic vocabulary, grammar, and cultural understanding needed for interacting with Spanish speakers at home and abroad.

10-140-110A Spanish Language Lab (1 cr.)
Provides additional Spanish language practice at all levels in reading, writing, grammar, pronunciation and listening. Multimedia materials are used (i.e. Rosetta Stone) to enhance the learning of language vocabulary and structure.

10-140-111 Spanish 2 for Professionals (2 cr.)
Enables students to advance their conversational skills in realistic work and social environments while further developing cross-cultural insights needed for successful interactions with Spanish-speaking people both at home and abroad.

10-140-112 English Intermediate Grammar (2 cr.)
Introduce Intermediate- to High Intermediate-level grammar concepts for the Intermediate-level ELL students. Students will learn to analyze and use the grammatical structures of English.

10-140-114 Spanish 3 for Professionals (2 cr.)
In this continuation of Spanish 2, students develop additional communicative and written skills in real-life situations and gain a better understanding of the Spanish-speaking cultures of the world in relationship to their own.

10-140-119 Spanish 4 for Professionals (2 cr.)
As a continuation of Spanish 3, students will continue to increase vocabulary, refine communicative skills, and further study cultural topics. Principles of grammar are systematically reviewed focusing on the use of the present, past and future tenses.

10-140-122DE Global Understanding (3 cr.)
Develop global perspectives while acquiring skills to effectively work in global environments. Learners compare and contrast patterns of work related practices. Topics include the impact of geography, history, religion, and politics in shaping behaviors and social interactions like; non-verbal communication, negotiating, conflict management, team work, decision making and motivation.

10-140-127 Spanish Immersion (3 cr.)
Travel to another country on a two-week language and culture immersion program. Classes are small, taught by native Spanish speakers and offered at all levels from beginners to advanced, with an option to take career-specific language courses. Students are immersed in the culture and live with carefully selected host families.

10-140-134 Spanish Advanced Conversation (2 cr.)
Designed for individuals who have had extensive exposure to Spanish in the classroom or through traveling, desiring to refresh their written and spoken communication skills. Upon completion of the course, students will possess a higher-level of proficiency necessary for special-purpose communication in Spanish.

10-140-143 Spanish 1 Health Care (3 cr.)
Students learn basic phrases and questions necessary for health care tasks. Upon completion, the participant will have the basic ability to understand spoken Spanish, gain insight into cross-cultural issues as well as to express and obtain explanations of common symptoms, the nature and the duration of an illness and obtain patient vitals.

10-140-144 Spanish 2 Health Care (3 cr.)
Presents more complex phrases, questions and in-depth vocabulary for health-related tasks. At the conclusion of this course, the participant will have the ability to understand more complex spoken Spanish, gain further insight into cross-cultural issues as well as to obtain information about more complex health symptoms and illnesses. Spanish 1 Health Care or consent of instructor is required.
10-140-145 Spanish 1 Law Enforcement (3 cr.)
Students learn basic phrases and questions to carry out law enforcement protocols. The participant will have the basic ability to understand spoken Spanish, obtain basic job related information, identify individuals, time and date of incidents, obtain descriptions, and express commands.

10-140-146 Spanish 2 Law Enforcement (3 cr.)
Presents more complex phrases, questions and in-depth legal vocabulary necessary to carry out specific law enforcement protocols. The participant will have the ability to understand spoken Spanish, obtain a wider variety of information such as identifying individuals and the nature and time of incidents, and to obtain descriptions of the individuals.

10-140-148 English Beginners Grammar & Writing (5 cr.)
Provides comprehensive language training focusing on developing writing skills, communication and cultural awareness necessary for English language learners to prepare for college level technical programs. Beginning writing and grammar as well as study skills will be emphasized. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.

10-140-148G English Terminology for Microsoft Office Suite (2 cr.)
Provides the review of the terminology related to Word, Excel, Access and PowerPoint. Offered as a bridge course to MS Office Suite Intro, this course introduces the IT language and terms characteristic of the most popular computer business applications required on the job and in all technical college business certificate and AAS programs. Students will develop a dictionary of IT terminology. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.

10-140-148J English Healthcare Language for Nursing Assistant (2 cr.)
Focuses on preparing students to master medical and occupational language necessary for their future ELL-CNA Bridge course.

10-140-149 English Beginners Reading & Vocabulary (5 cr.)
Provides comprehensive language training focusing on developing communication, writing skills, and cultural awareness necessary for English language learners to prepare for college level technical programs. Reading and vocabulary skills as well as study skills will be emphasized. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.

10-140-150 English Beginners Listening & Speaking (5 cr.)
Provides comprehensive language training sequence focusing on developing communication, writing skills, and cultural awareness necessary for English language learners to prepare for college level technical programs. Listening and speaking skills as well as study skills will be emphasized. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.

10-140-156 Spanish 1 for Business (3 cr.)
An introduction to the Spanish language focusing on terminology and culture as it pertains to business. This course is designed for the student/professional who uses or may need to use Spanish in a business setting and would like to expand their horizons while enhancing their resume. Beyond language tools and basic conversation skills, participants will gain insight into Hispanic cultures in order to improve communication and aid in building a rapport with Spanish speaking clients, employees or colleagues.

10-140-156A Spanish 2 for Business (3 cr.)
Presents more complex phrases, questions and in-depth vocabulary for business related functions. At the conclusion of this course, the participant will have the ability to understand more complex spoken Spanish, gain further insight into cross-cultural issues as well as to obtain information about more complex health symptoms and illnesses. Spanish 1 Business or consent of instructor is required.

10-140-157 Spanish Intermediate Conversation (2 cr.)
Designed for students and professionals who have attained an intermediate level of Spanish at FVTC or elsewhere, desiring to practice and enhance their conversational ability. Upon completion of the course, students will speak Spanish at an intermediate level with increasing comfort and effectiveness. Completion of Spanish 3 for Professionals or consent of instructor is required.
10-140-164 Fundamentals of Interpretation (3 cr.)
Provides an introduction to the study of interpretation. Presents interpretation as a communicative task and surveys assignments and text types most commonly encountered in the interpretation profession. Explores the basic theoretical concepts and teaches to apply this knowledge. Focuses on the processes for understanding, analyzing and interpreting different kinds of texts from a source language into a target language. Bilingual fluency (native fluency in English and other languages) is required.

10-140-165 Medical Interpretation (3 cr.)
Focuses on learning medical terminology for interpretation from foreign languages into English and from English into foreign languages. Develops techniques, practice and knowledge needed to provide interpretation in the medical environment. Emphasizes interpretation modes such as sight interpretation and simultaneous and consecutive interpretation in medical settings. Bilingual fluency (native fluency in English and other languages) is required.

10-140-166 Legal Interpretation (3 cr.)
Focuses on learning legal terminology for interpretation from foreign languages into English and from English into foreign languages. Develops techniques, practice and knowledge needed to provide interpretation in the legal and law enforcement environment. Emphasizes interpretation modes such as sight interpretation and simultaneous and consecutive interpretation in legal settings. Bilingual fluency (native fluency in English and other languages) is required.

10-140-167 Technical Interpretation (3 cr.)
Focuses on learning technical terminology for interpretation from foreign languages into English and from English into foreign languages. Develops techniques, practice and knowledge needed to provide interpretation in the technical and manufacturing environment. Emphasizes interpretation modes such as sight interpretation and simultaneous and consecutive interpretation in technical and manufacturing settings. Bilingual fluency (native fluency in English and other languages) is required.

10-140-168 Interpretation Internship (3 cr.)
Engages in a specialty area internship to produce an interpreted product. Includes portfolio development, internship objectives and on-site supervised training.

10-140-173 Spanish 1 Culinary Arts (3 cr.)
An introduction to the Spanish language focusing on terminology as it pertains to communicating culinary and restaurant tasks. Upon completion of this course, the participant will have the basic ability to understand spoken Spanish, deliver basic job related commands, explain simple culinary/restaurant procedures, and gain insight into culture as it relates to interacting with Spanish speakers.

10-140-174 Spanish 1 Fire Protection (3 cr.)
Students learn basic phrases and questions to carry out fire protection protocols. The participant will have the basic ability to understand spoken Spanish, obtain basic job related information, identify individuals, time and date of incident, deliver important safety rules and related commands.

10-140-177H English Advanced Grammar (2 cr.)
Introduce high-level grammar concepts for the high level ELL students. Students will learn a sophisticated analysis of the grammatical structures of English. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.

10-140-177I English Advanced Reading & Writing (3 cr.)
Provides comprehensive language training focusing on further developing communication, writing skills and cultural awareness necessary for English language learners to prepare for college-level technical programs. Prepares students from an intermediate to advanced level of language proficiency. Writing and grammar as well as study skills will be emphasized. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.

10-140-177J English Intermediate Writing (3 cr.)
Provides comprehensive language training focusing on further developing communication, writing skills and cultural awareness necessary for English language learners to prepare for college-level technical programs. Prepares students from an intermediate to advanced level of language proficiency. Writing and grammar as well as study skills will be emphasized. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.

10-140-177L English Beginners Writing Lab (2 cr.)
Focuses on the acquisition of the fundamental grammatical competence that is essential to produce effective writing materials in English. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.
**Course Descriptions**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
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<tbody>
<tr>
<td>10-140-178A</td>
<td>English Intermediate Reading &amp; Vocabulary (3 cr.)</td>
<td>Provides comprehensive language training focusing on further developing communication, writing skills and cultural awareness necessary for English language learners to prepare for college-level technical programs. Prepares students from an intermediate to advanced level of language proficiency. Reading and vocabulary skills as well as study skills will be emphasized. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.</td>
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<td>10-140-179A</td>
<td>English Intermediate Listening &amp; Speaking (3 cr.)</td>
<td>Provides comprehensive language training focusing on further developing communication, writing skills and cultural awareness necessary for English language learners to prepare for college-level technical programs. Prepares students from an intermediate to advanced level of language proficiency. Listening and speaking skills as well as study skills will be emphasized. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.</td>
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<tr>
<td>10-140-180B</td>
<td>English Beginners Pronunciation (2 cr.)</td>
<td>Provides comprehensive language training focusing on further developing communication, writing skills and cultural awareness necessary for English language learners to prepare for college-level technical programs. Prepares students from an intermediate to advanced level of language proficiency. Pronunciation and oral presentation skills as well as study skills will be emphasized. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.</td>
</tr>
<tr>
<td>10-140-181A</td>
<td>English Intermediate American Language &amp; Culture-Multimedia (3 cr.)</td>
<td>A continuation of Spanish 2 Health Care presents increasingly complex phrases, grammar and in-depth vocabulary for health-related tasks. Students will understand and express complex spoken Spanish as it relates to health care, gain awareness of cross-cultural issues as well as obtain information about more specific health-related symptoms and illnesses. Spanish 2 Health Care or consent of instructor is required.</td>
</tr>
<tr>
<td>10-140-184A</td>
<td>English Terminology for Oral Communication (2 cr.)</td>
<td>Focuses on developing professional terminology in various communication skills from a language learner perspective, including speaking and listening. In this credit course, students learn to understand cultural differences in intrapersonal/interpersonal and nonverbal communication skills and practice through oral presentations and group activities. Students will complete customized dictionary of communication terms. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.</td>
</tr>
<tr>
<td>10-140-184B</td>
<td>English Terminology for Business &amp; Entrepreneurship (2 cr.)</td>
<td>Assists potential start-up and early-stage ELL entrepreneurs and business majors in developing language related to business management and planning tools for new business ventures. This course is a bridge to the Introduction to Entrepreneurship course. Students will learn new vocabulary, practice sentence structure, and improve reading and writing business documents. At completion, students will have a business and entrepreneurship dictionary compiled. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.</td>
</tr>
<tr>
<td>10-140-184C</td>
<td>English Terminology for Principles of Accounting (2 cr.)</td>
<td>Introduces basic concepts and general principles of accounting to non-accounting students. Topics include financial statements, merchandising accounting for cash, inventory, payroll, and budgeting and accounting software. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.</td>
</tr>
<tr>
<td>10-140-187A</td>
<td>English Intermediate American Language &amp; Culture-Multimedia (3 cr.)</td>
<td>During this class you will be working on the skills that promote stronger language abilities, i.e. speaking, listening, reading and writing. In addition, you will also be strengthening the skills needed to be a successful university student, i.e. note-taking, critical thinking and classroom participation. The course also provides an opportunity to explore American Culture through Multi Media (film, television, periodicals and music). We will be discussing class, race, education and gender roles in society. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.</td>
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</table>
10-140-187A English Advanced American Language & Culture-Multimedia (3 cr.)
During this class you will be working on the skills that promote advanced language abilities, i.e. speaking, listening, reading and writing. In addition, you will also be strengthening the skills needed to be a successful university student, i.e. note-taking, critical thinking and classroom participation. The course also provides an opportunity to explore American Culture through Multi Media (film, television, periodicals and music). We will be discussing class, race, education and gender roles in society. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.

10-140-190 English Intermediate Pronunciation (2 cr.)
For those who want to learn English as a foreign language, students will develop and refine pronunciation to help prepare them for academic programs. Designed to improve vowel clarification, consonant reproduction, intonation, stress, blends and reductions. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.

10-140-190A English Advanced Pronunciation (2 cr.)
Focusing on pronunciation fundamentals of sound production, stress, enunciation, pitch, and tone, this course provides comprehensive language training focusing on further developing oral communication skills and cultural awareness necessary for English language learners to prepare for college-level programs. Prepares students from intermediate and advanced level of language proficiency to improve their speech. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.

10-140-191A English TOEFL/TOEIC Preparation (2 cr.)
Familiarizes students with the English language skills, academic skills and testing strategies necessary to prepare them for the TOEFL iBT or TOEIC. Reading, speaking, listening and writing skills are taught in the context of the standardized ELL tests. New students, prior to registration contact 920-735-2443 in Appleton or 920-236-6183 in Oshkosh for an assessment to determine your proficiency in English.

10-140-197 Spanish 4 Health Care (3 cr.)
A continuation of Spanish 3 Health Care presents increasingly complex phrases, grammar and vocabulary. Students will understand and express more complex health-related Spanish including identifying more symptoms and illnesses and further study of cross-cultural topics. A capstone course which focuses on practice and application of concepts learned in Spanish Health Care 1-3. Spanish 3 Health Care or consent of instructor is required.

145 Small Business

10-145-100 Entrepreneurial Venture-Your Business Plan (3 cr.)
Focuses on the business planning process of business concept development through financial projections and planning. This is a blended-learning course designed to teach students how to research, develop and write detailed start-up business plans which can be used to create successful businesses. The blended-learning environment combines the flexibility of Internet-based e-learning with the benefits of face-to-face instruction.

10-145-102 Entrepreneur E-Business Plan (3 cr.)
Designed to help entrepreneurs master the skills needed to succeed in executing an online business. Examines three commonly employed e-business models: online storefront (e-store), online auctions and advertising-based businesses.

10-145-104 Entrepreneurship, Introduction to (3 cr.)
Provides students with opportunities to investigate, understand and apply the process of choosing entrepreneurship as a career path. Explores the entrepreneurial experience by focusing on an awareness of entrepreneurship, opportunity recognition, business concept development and preliminary feasibility testing. Students gain the knowledge, skills, concepts and strategies relevant for start-up and early-stage entrepreneurs. The practical hands-on approach encourages students to immerse themselves in the entrepreneurial experience.

10-145-105 Managing Your Entrepreneurial Venture (3 cr.)
Introduces how to manage an entrepreneurial venture through the three developmental stages of growth, expansion and maturity.
10-145-106 Financial Management for Entrepreneurs (2 cr.)
Expands on student’s ability to demonstrate an understanding of financial terminology, read, prepare and analyze a financial statement, and write a loan proposal. Examines the importance of working capital and cash management and the ability to identify basic business taxes. Covers payroll taxes including social security taxes, income taxes, unemployment taxes, completion of quarterly and annual reports, and a payroll simulation project.

10-145-110 Entrepreneurial Sales (3 cr.)
Examines concepts of the selling process. Topics include function of selling in business, personal selling, buying behavior, structuring the sales presentation, product presentation and account servicing. Sales Principles (10-104-166) will be accepted for this course requirement in the Business Owners’ Entrepreneurship certificate.

10-145-111 Entrepreneurial Promotion (3 cr.)
Examines the theory, practice and management of advertising. Topics include the development of an advertising plan, selecting media, promotional strategies and creativity as well as print, broadcast and website marketing. Promotion Principles (10-104-147) will be accepted for this course requirement in the Business Owners’ Entrepreneurship certificate.

10-145-112 Entrepreneurial Market Research (3 cr.)
Focuses on the skills and techniques necessary to conduct basic market research. Topics include problem definitions, planning studies, use of secondary data, questionnaire design and development, instrument administration, data collection and interpretation. Marketing Research (10-104-113) will be accepted for this course requirement in the Business Owners' Entrepreneurship certificate.

10-145-113 Entrepreneurial Marketing (3 cr.)
Examines the role played by marketing in society. Focuses on consumer motivation, market segmentation, product development, advertising and channels of distribution. Marketing 1, Principles of (10-104-151) will be accepted for this course requirement in the Business Owners' Entrepreneurship or the Entrepreneurs’ Start-up Venture certificates.

10-145-114 Entrepreneurial Innovation/Choice Analysis (3 cr.)
Investigates the relationship between entrepreneurial thinking and the opportunity to ignite the creative spark that leads to idea generation and new venture creation.

10-145-181 Entrepreneurial Venture Financing (2 cr.)
Deals with developing a financial management system for a small business, calculating financial reports, and acquiring an appreciation for the importance of accurate report and recording keeping. Identifies potential financial and technical support resources.

31-145-300 Small Business, Introduction to (2 cr.)
An introduction for individuals who are interested in operating or working in a small business. Studies forms of ownership, personnel practices, motivation, effective communication and business planning for success.

150 IT - Network Communications

10-150-105 Virtualization Technologies (3 cr.)
Teaches system administrators how to deploy virtualization in a network environment, thus taking greater advantage of hardware and software resources. Virtualization is the ability for a single system to act as multiple systems and is becoming a key technology in IT data centers.

10-150-107 System Administration (3 cr.)
Covers designing, building and administering a network utilizing a variety of software systems including Windows server and client, Linux server and client, and Macintosh.

10-150-115 Network Cabling (2 cr.)
Examines structured premises cabling systems, industry standards, media characteristics, connectors, transmission, electrical concepts, safety, pulling and terminating cable, and testing cable.

10-150-116 Network Hardware Technologies (3 cr.)
Covers networking topics including the OSI model, local area and wide area networking. Also focuses on assigning network addresses and configuring network devices including Cisco routers and switches. Includes considerable hands-on learning activities and helps prepare learner for the Cisco CCNA exam.

10-150-122 Advanced Network Hardware Technologies (3 cr.)
Covers advanced networking topics including routing protocols, network services, PPP, Frame relay, switching, VLANs and network security. Includes considerable hands-on learning activities and helps prepare learner for the Cisco CCNA exam.

10-150-124 Network Service & Support (3 cr.)
Explores implementing a variety of user services in a networked environment. Students learn training and troubleshooting techniques through a variety of hands-on learning activities.
10-150-127 IT Project Management (2 cr.)
Examines the organization, planning and controlling of projects; also provides practical knowledge on managing project scope, schedule and resources. Topics include project life cycle, work breakdown structure and Gantt charts, network diagrams, scheduling techniques and resource allocation decisions. Concepts are applied through team projects and tutorials using project management software.

10-150-129 Scripting Using Perl (3 cr.)
Introduces nonprogramming students to scripting. During this course students will develop the scripting skills necessary for solving common business problems. Structured programming and modular design techniques are emphasized. Students will be required to complete simple to complex scripting assignments.

10-150-141 Operating Systems Security (2 cr.)
Covers the basics of securing both Windows and Linux servers. The course will start with the basics of hardening or securing the operating system itself and moves on to include topics such as authentication, service security, contingency planning, and group security policies, procedures, implementation and more.

10-150-143 Computer Security, Introduction to (2 cr.)
Examines various ways that malicious software can infect or attack computers. Also explores how to identify and implement methods to avoid these attacks.

10-150-143DE Computer Security, Introduction to (2 cr.)
Examines various ways that malicious software can infect or attack computers. Also explores how to identify and implement methods to avoid these attacks.

10-150-144 Ethical Hacking and Network Defense (3 cr.)
Introduces the techniques hackers use to discover vulnerabilities. Students will learn ways to tighten the network security to protect the exposed data from the discovered vulnerabilities. Focus is on penetration-testing tools and techniques that security testers and ethical hackers use to protect computer networks.

10-150-145 IP (Internet Protocol) Telephony (2 cr.)
Presents the orientation and foundation for installing, configuring and maintaining IP (Internet Protocol) telephony solutions. Hands-on labs using Avaya and Cisco equipment help the learner work through real world voice, video and data applications to enhance personal and professional confidence with IP telephony networks.

10-150-146 Wireless Networking (2 cr.)
Covers how wireless devices connect to networks, wireless device configurations, standards and security. Wireless networking is one of the fastest growing areas of technology available today. Considerable hands-on learning is included.

10-150-147 Linux, Introduction to (2 cr.)
Covers introductory Linux topics including operating system basics, system installation, file system management, file system administration and basic commands. Considerable hands-on learning is included.

10-150-148 Linux Administration (3 cr.)
Covers advanced Linux topics including scripting in the BASH shell, system initialization, working with X Windows, managing Linux processes, system administration tasks, system backup, software installation, troubleshooting, system performance, network configuration and security. Considerable hands-on learning is included.

10-150-150 E-mail Administration (2 cr.)
Focuses on the implementation and administration of e-mail servers in both a Windows and a Linux environment. Topics include creating user mailboxes, SMTP mail, backup and recovery, and other administration tasks. Also covers virus protection and security of e-mail servers and includes considerable hands-on learning activities.

10-150-156 Windows Server (3 cr.)
Covers Microsoft Windows Server 2008 administration including server hardware and software, Active Directory, file resources, printers, disk resources, Web resources, DNS, DHCP, Remote Access Services, and virtualization. Monitoring and troubleshooting server resources are also examined. Extensive hands-on activities are included.

10-150-157 Cisco CCNA Academy Explore 1/2 Fundamentals (4 cr.)
Lays the foundation for your CCNA certification with training through Cisco-developed courses led by an authorized Cisco instructor. Covers Cisco coursework, e-learning, labs and simulations. This is the first of two Cisco courses provided to prepare for the CCNA 640-802 exam. Course is offered in a blended format with instructor-staffed lab; hours are open for flexible learning environment.
10-150-158 Cisco CCNA Academy Explore 3/4 Routing Conc (4 cr.)
A continuation of the Cisco CCNA Academy Explore 1/2 course. Covers Cisco coursework, e-learning, labs and simulations. This is the second of two Cisco authorized courses to prepare for the CCNA 640-802 exam. Course is offered in a blended format with instructor-staffed lab; hours are open for flexible learning environment.

10-150-160 Network Security (3 cr.)
Introduces students to intrusion detection tools, network security design, various types of network firewalls, and the basics of VPN configuration. A solid understanding of LAN/WAN fundamentals is required for this course.

152 IT - Application Development

10-152-102 Web Site Design Using Dreamweaver (3 cr.)
Focus is on the layout of web pages, tables, forms, rollovers, DHTML, and CSS using Dreamweaver. Students learn web design standards, elements of good page design, and site management. Skills presented include programming HTML and JavaScript, Cascading Style Sheets, and Flash text all within the Dreamweaver interface.

10-152-103 Web Site Animation Using Flash (3 cr.)
Create interactive web pages incorporating graphics, animation, sound, and programming using Flash. Course focuses on programming Flash web sites. Students learn action scripting, forms, and interactive techniques using Flash programming.

10-152-104 Web Design Basics Using Dreamweaver (1 cr.)
Covers basic Web page design including design elements and standards. Focus will be creating Web pages using tables, CSS, HTML, site management, organizing page content and layout including graphic design, image maps and rollovers. Skills presented include programming HTML and CSS.

10-152-105 Web Graphics, Introduction to (3 cr.)
Introduces the fundamental concepts necessary to generate and prepare graphics for Web pages. The course will focus on raster as well as vector images. Areas addressed will be color selection, layout, text, optimizing images, creating backgrounds, slicing, creating navigation, transparent graphics and animated graphics. Adobe software will be utilized.

10-152-105DE Web Graphics, Introduction to (3 cr.)
Introduces the fundamental concepts necessary to generate and prepare graphics for Web pages. The course will focus on raster as well as vector images. Areas addressed will be color selection, layout, text, optimizing images, creating backgrounds, slicing, creating navigation, transparent graphics and animated graphics. Adobe software will be utilized.

10-152-106 Cascading Style Sheets (CSS) (3 cr.)
Examines CSS structure and rules to create tableless layouts. Also focuses on use of relative, fixed or float position techniques, style and size fonts, creating Web site navigation and accessible Web sites, and working with CSS browser capability.

10-152-110 Java Applications Programming (3 cr.)
Java is one of the most used programming languages in the software industry. Programs written in Java run on any operating system. In this course, students learn the Java syntax, Object Oriented Programming, software design skills and algorithm development.

10-152-112 Visual Basic Intermediate (3 cr.)
Expands the concepts learned in Visual Basic Introduction. Information is managed using both file-based and database systems. It covers programming logic and design, database access methods, and Object Oriented Programming (OOP) using Visual Basic.NET.

10-152-113 Advanced Programming (2 cr.)
Explores advanced programming techniques using Visual Basic.NET. Focuses on using Object Oriented Programming (OOP), advanced controls, data reporting tools, deployment and database access methods. Project presentation will be done via Windows Form and Web Forms using ASP.NET. Project design and management will be developed and used throughout the class.

10-152-114 Computer Programming C++ (3 cr.)
Introduces C++ programming concepts and statements including input and output of data in a console application, variables and data type considerations, if-else and switch-case programming constructs, looping constructs, creating programmer defined functions, arrays, pointers, string manipulation, data structures and sequential file processing. It also introduces Object Oriented Programming in the C++ language.
10-152-115 Visual Basic Introduction (3 cr.)
Introduces students with little or no programming background to programming and logic principles that apply to traditional and Windows systems. Uses Visual Basic.NET to apply the principles by developing simple Windows applications.

10-152-116 C# Programming (3 cr.)
Introduces C# programming concepts and statements starting with basic class/object terminology. Investigates data types, assignment statements, methods and behaviors, if statements, loops, arrays and collections, Windows (GUI) programming, event programming, inheritance, file IO, exception handling and Database Access using ADO.NET.

10-152-117 JavaScript, Introduction to (3 cr.)
Teaches basic concepts of programming using JavaScript and XHTML languages. Focuses on embedding JavaScript in HTML, program control logic and introduces object-oriented programming.

10-152-120 Web Development Using XHTML (2 cr.)
Presents the foundation skills necessary to create Web pages using HyperText Markup Language (HTML). Covers design concepts, hypertext links, tables, frames and Cascading Style Sheets (CSS).

10-152-121 Dynamic Web Applications (3 cr.)
Introduces concepts in developing dynamic, server-side Web applications that accept input from forms and process the data on the Web server to maintain a database. Two approaches are covered--open source language PHP and Microsoft's ASP.Net framework. Concepts of XHTML are extended to learn techniques to develop a robust, interactive Web site.

10-152-124 XML Development (3 cr.)
Introduces Extensible Markup Language (XML) and how to build Web applications using XML and its related technologies including XSL, schemas and data binding.

10-152-125 Web Development with ASP.Net (3 cr.)
Gives students a first look at the ASP.Net architecture to create and maintain a dynamic Web site. Microsoft's Visual Studio will be used to design, code and test multi-page Web applications that use a database and manage state. Master pages and themes, grid controls and 3-tier applications are covered.

10-152-126 Advanced Web Applications (3 cr.)
A capstone course in which students utilize multiple Web technologies to build a complete and functional Web site in a group setting to simulate real-world development. Project design and management methodologies will also be introduced to expose students to estimating and project management techniques.

10-152-130 Web Site Administration (2 cr.)
Identifies support of various features of Microsoft Internet Information Servers. It covers installing, configuring and implementing all components of the server as well as setting up a Web site.

10-152-155 Database Concepts (2 cr.)
Uses hands-on exercises and projects to give students experience with using databases for data storage and retrieval. To encourage students to become more sophisticated database users, background information and general relational database concepts are included.

10-152-161 Structured Query Language (2 cr.)
Integrates relational concepts and theory while writing interactive SQL code to create, load, manipulate and query relational tables. It explores the concepts of fourth-generation languages, end-user computing and prototyping.

10-152-162 Database Servers (2 cr.)
Covers the operation and management of client/server back-end relational databases. Topics include data definition language, table modification, creating views, indices, triggers, transactions, backup and recovery.

10-152-163 Database Design (3 cr.)
Expands on the concepts of the Database Fundamentals course. Reviews design techniques and normalization concepts related to creating a database. Introduces the concepts of security planning, performance tuning, analysis, and deployment and maintenance duties.

10-152-165 Oracle Database Administration (3 cr.)
Provides comprehensive training for developing and supporting relational database applications using Oracle database and application development utilities. It also covers maintenance and management of the Oracle environment.

10-152-166 Python and MySQL Introduction (3 cr.)
Introduces students to programming using the powerful, yet easy to learn, Python language. Python is the language behind many mission-critical applications including Google. Students will write applications using Python and MySQL.
10-152-167 Database Fundamentals (3 cr.)
Focuses on basic database concepts and design principles. Includes hands-on applications and uses the concepts of relational database applications by designing, populating and joining relational tables using Access software.

10-152-168 Data Access for Programmers (3 cr.)
Provides background in fundamental database concepts, design, documentation, implementation and distribution involving the relational database model. Students will create, query and update relational databases using Structured Query Language (SQL).

154 IT - Computer Support

10-154-101 Supporting Emerging PC Technologies (3 cr.)
Explores the acquisition and support roles of PC peripheral technologies. Learn to use different learning methodologies to develop and present a Portfolio of Assessment. Through lectures, demonstrations and hands-on applications, students examine file formats, digital imaging (cameras, scanners and video), printer technologies, PDAs, storage devices, sound technologies and displays.

10-154-102 IT Customer Service Skills (2 cr.)
Covers the interpersonal, communication and problem-solving skills required in technical support positions. Exercises provide interaction with other learners in a team. Students explore the information and technical tools needed to function effectively in a support position.

10-154-103 Help Desk Concepts (4 cr.)
Introduces techniques used to install software, document software installations and how to train end-users. Explains basic concepts and implementation of a training plan. Also presents an overview of help desk operations. Students gain a better understanding of how people, processes, technology and information affect the typical help desk.

10-154-104 PC Support (2 cr.)
Covers the basics of supporting a personal computer. Through significant hands-on activities, learn how to install, utilize and configure operating systems as well as troubleshoot and repair computer hardware issues. Preventive maintenance and connecting computers to networks and the Internet are also covered.

10-154-105 Desktop Service and Support (2 cr.)
Provides students with the background needed to build the knowledge and skills to support end-users and computers running the Microsoft suite of productivity applications. The course is directed at the skills needed to work in a variety of environments, including corporate environments as well as support for home users via phone support, remote support and retail counter support.

10-154-106 Desktop Repair and Maintenance (2 cr.)
Covers configuring, maintaining, upgrading and repairing Intel-based computers and exploring functions and interrelations between components. The course examines system configuration, component care, system improvement, troubleshooting and failure identification. Advanced PC operating system concepts are also covered.
160 Business Health Services

10-160-100 Intro to Medical Administrative Careers (1 cr.)
Introduces various aspects of medical administrative careers. Explores a variety of topics including career expectations, future employment opportunities and current employment trends.

10-160-105 Medical Administrative Internship (3 cr.)
Provides on-the-job training that allows students to apply the theories, skills and techniques studied in the program. Students work a minimum of 144 hours in a medical-related setting. The internship includes weekly discussions of such topics as career goals and teambuilding.

170 Broadcast Captioning

10-170-101 Captioning/CART I (4 cr.)
Learn to write dictation at 160 wpm; broadcast 10 minutes non-stop; write new punctuation and symbols, new flagged alphabet characters, environmental sounds, web/Internet addresses, common proper names, common female and male first names, governmental/political terms, terms applicable to food, the names of animals, finger-spell words, increase vocabulary, use terms applicable to criminology, and manage dictionaries.

10-170-143 Internship in Broadcast Captioning/CART (1 cr.)
Learn to caption live broadcast, use television broadcast terminology, describe television broadcast operations, and provide CART services to a hearing-impaired person. Students must be writing at 180 words per minute literary prior to enrolling in this course.

182 Logistics & Materials Management

10-182-110 Business Logistics (3 cr.)
Reviews logistics terminology, history of transportation, and government rules and regulations. Also studies supply chain management principles including total cost concepts, plant or warehouse location decisions, material handling options, and current logistics-related computer technologies.

10-182-111 Transportation Administration (2 cr.)
Presents the fundamental elements of the administrative aspects of transportation operation including freight classification, tariffs, carrier pricing schedules, carrier selection, bills of lading, contracts, routing guides and freight claims.

10-182-112 Effective Communication and Negotiations (3 cr.)
Reviews basic oral and written skills used in business communications. Also studies the crucial skills, strategies, tools and techniques to effectively handle business negotiations.

10-182-113 International Logistics (2 cr.)
Examines international transportation of both imports and exports. Also covers preparation of export and import documentation as well as the management and selection of international transportation modes and pricing regulations.

10-182-114 E-Commerce Logistics (2 cr.)

10-182-115 Procurement Fundamentals (3 cr.)
Introduces the concepts and techniques of modern purchasing, including its role in business and industry, legal and ethical issues, contract administration, and supply chain management.

10-182-116 Sustainable Materials Management (3 cr.)
Explains how sustainable practices and technology can be applied to the supply chain to enhance profitability while reducing its overall environmental footprint. This course covers systems thinking, energy conservation within the supply chain, green procurement emerging trends and the three P's--people, planet and profit.

10-182-117 Supply Chain Internship (3 cr.)
Provides students with practical work experience in the supply chain management field. Internship work is supervised and evaluated.
196 Management Development (SpvMgt)

10-196-104 Labor Relations (3 cr.)
Focuses on labor organizations and relationships with management, government agencies and other organizations. Covers contract negotiations, the grievance process, arbitration preparation and labor laws.

10-196-107 Business Management, Introduction to (3 cr.)
An overview of the free enterprise system, types of business organizations, the managerial process, human resources management, business finance, management information systems and international business.

10-196-110 Cost Controls and Budgeting (3 cr.)
Examines how financial information is interpreted and applied by supervisors/managers in planning and controlling business activities. This managerial accounting course emphasizes the budgeting process.

10-196-121 Safety, Principles of (2 cr.)
Explains the supervisor's role in developing and implementing safety procedures and accident prevention programs in all types of work environments. It includes ergonomics, office safety, health care costs and Occupational Safety and Health Administration (OSHA) standards. Students earn the OSHA 10-Hour Voluntary Compliance card.

10-196-131 Problem Solving (2 cr.)
Presents basic problem-solving techniques. Emphasizes the importance of identifying the real problem, identifying the causes, looking at alternative solutions, arriving at a solution and following up to ensure implementation.

10-196-139 Employee Training and Development (3 cr.)
Identifies training and development skills through practice and skill-building activities. This course focuses on the role of training in the development of facilitation skills, using recognized training methods, and evaluating learning and training processes.

10-196-150 Employment Law (3 cr.)
Introduces employment and labor law. This course emphasizes human resource management and labor relations. It explores employment and labor and social issues in the work environment through the laws that govern the employer/union and employer/employee relationships.

10-196-151 Employee Relations (3 cr.)
Enhances the ability to understand and develop employee-focused programs, policies and procedures such as company orientations, formal and informal communications, employee recognition programs and community relations, complaint investigation and resolution, and disciplinary procedures.

10-196-153 Compensation and Benefits (3 cr.)
Focuses on the compensation and benefit elements that make up total compensation. This course covers base pay, merit pay and variable pay programs and examines such benefits as government regulation, group welfare plans, pension plans and flexible benefit plans.

10-196-154 Recruiting and Hiring (3 cr.)
Focuses on recruitment, selection and hiring practices. This course examines what today's workforce expects and how to efficiently use the recruitment budget. All steps of the hiring process are reviewed. This material supplements the legal aspects of the employment process.

10-196-156 HR Aspects of Insurance Administration (3 cr.)
Identifies the varieties of insurance available to companies and employees and the trends in the insurance industry. Analyzes insurance cost controls and alternative solutions. This course supplements the Employment Law class by presenting the legal aspects of insurance such as policies, procedures, required forms and timelines.

10-196-160 Training Design and Measurement (3 cr.)
Explains the fundamentals of training and development coordination. It includes terminology, levels of learning, matching training providers with organization needs, organizing materials and environments to maximize learning, measuring completion of objectives, and communication with employees.

10-196-161 HR Record Keeping Systems (3 cr.)
Covers the fundamentals of human resource record keeping. Topics include organizing records, federal and state retention requirements, documentation, employee access to records, privacy issues, and developing policies.

10-196-168 Principles of Budgeting for HR (3 cr.)
Explore and assess the financial information required to analyze and interpret financial documents pertinent to the Human Resource field. While an emphasis is placed on budgeting and the budgeting process, it is not intended to be an in-depth study of the accounting field.
10-196-169 HR Applied Project (2 cr.)
Applies the theories, skills and techniques studied in the Human Resources program to project work in an area of HR in which the student has not previously worked.

10-196-170 Communication Skills for Managers (1 cr.)
Provides a step-by-step guide for effective communication. Topics include writing reports and proposals, making effective presentations, understanding and using nonverbal communication and listening effectively. This course is offered in cooperation with the American Management Association-Extension Institute.

10-196-171 Supervisory Management Portfolio (1 cr.)
Provides the opportunity for Supervisory Management program students to earn credits toward their degree from previous education, training, work experience and military service. Department consent required.

10-196-190 Leadership Development (3 cr.)
Covers the supervisor’s role in leadership effectiveness. Topics include theories of leadership, development and implementation of teams, impact of leadership style, philosophy of corporate culture and leadership in the global marketplace.

10-196-191 Supervision (3 cr.)
Uses a practical approach to training people in the basics of supervision and management. This course emphasizes the application of theory and covers management functions, the skills needed to perform those functions, the history of management, contemporary management trends, ethics, communication and total quality management.

10-196-192 Managing for Quality (3 cr.)
Applies the skills and tools necessary to implement and maintain a continuous improvement environment. Each learner will demonstrate the application of a personal philosophy of quality, identifying all stakeholder relationships, meeting/exceeding customer expectations, a systems-focused approach, using appropriate models and tools, managing a quality improvement project and measuring effectiveness of continuous improvement activities.

10-196-193 Human Resources Management (3 cr.)
Covers the supervisor's role in human resources planning. Topics include human resource development, employee selection, performance appraisals, compensation, training, labor relations, organizational productivity, motivation, teamwork and affirmative action.

204 Printing and Publishing

10-204-107 Package and Label Introduction (5 cr.)
Introduces students to flexographic printing. It focuses on job planning skills such as die and package layouts and job order preparation. The content is presented through lecture, lab activities and field trips.

10-204-108 Flexo Printing Prepress (5 cr.)
Introduces the field of graphics preparation using desktop and proprietary computer systems and programs. Topics include illustration and photo-editing software, scanning and digital trapping, and photopolymer platemaking. Students prepare graphic designs, prepress proofs, and printing plates for jobs printed on flexo presses.

10-204-109 Flexo Press Operations 1 (5 cr.)
Introduces students to the basic principles and practices of flexographic press operation. Narrow web, wide web and corrugated press techniques will be covered. Students are required to flexographically print various designs to customer specifications. Pressroom record keeping will be discussed.

10-204-110 Flexo Press Operations 2 (5 cr.)
Teaches students advanced techniques to print process color work for wide web, narrow web and corrugated flexography. Printing press fingerprinting and print evaluation will be explained. Students will use instruments to calculate print compensations for flexo printing. Troubleshooting printing problems will also be covered.

10-204-111 Flexo Production Techniques (3 cr.)
An advanced hands-on course that will apply all of the various printing techniques studied. Students will follow job specifications to create and print package and label designs in a production environment.

10-204-112 Flexo Corrugated Technologies (5 cr.)
Learn about corrugated flexographic printing and converting techniques through hands-on shop work, classroom presentations and individualized study. Students will learn how to operate corrugated printing presses and die cutting equipment used in the manufacturing of consumer packaging products. Substrates, record keeping and equipment maintenance will also be covered.
10-204-113 Digital Prepress 2 (3 cr.)
Provides further experience in the production of publications within a modern digital prepress workflow using Adobe InDesign. Topics include tabs, formatting of long documents, merging text and graphics, advanced style sheets, and further exploration of the tools and features available in Adobe InDesign. Students prepare files for conventional offset and digital print media. Students will create a number of projects that will serve as portfolio pieces.

10-204-114 Digital Prepress 1 (3 cr.)
Introduces digital prepress techniques used to print products using lithographic offset printing and/or digital output devices. Adobe InDesign is used to explore formatting text, working with graphics, typography, file preparation and page layout procedures. Students practice basic file management and merge text with graphics to produce finished documents. Students will also work with the vector drawing tools found in Adobe InDesign. Department consent required.

10-204-117 Digital Imposition (2 cr.)
Prepares students to perform prepress duties and tasks currently used to prepare proofs and plates for offset printing. Learners work with files to digitally impose jobs that will be run using modern Computer-to-Plate (CTP) technologies. Through the use of hands-on learning, students will become familiar with the Rampage/Preps workflow used in medium-sized, multicolor offset press applications.

10-204-124 Printing & Publishing Internship (3 cr.)
Provides students with the opportunity to experience real world working conditions including production schedules, customer expectations and challenges through actual on-the-job training. This course is subject to job site availability, appropriateness of available training, scheduling and travel. Students must complete at least half of the Printing and Publishing program before being eligible for this course. Students meet with the instructor and locate a position in the printing industry before registering for this course.

10-204-127 Flexographic Printing, Introduction to (2 cr.)
Introduces the flexographic printing process. The function and relationship of plates, inks, solvents and substrates are studied as they relate to the flexo printing operation. Presswork is taught through analysis of press operations and components and actual hands-on operation through production runs. Tours of flexo operations are included.

10-204-140 Binding & Finishing (2 cr.)
Introduces the finishing operations used to complete printed pieces. Topics include trimming, folding, gathering, booklet making, padding, binding, stitching, drilling, packaging and mailing.

10-204-141 Graphic Reproduction Methods (3 cr.)
Introduces various printing processes, their strengths, and limitations and introduces the topic of workflow through a printing plant. This course combines lectures, lab activities, and field trips to acquaint students with the industry and its primary print processes. Department consent required.

10-204-142 Design & Copy Preparation (2 cr.)
Introduces students to basic design principles used to design pages that will be printed using lithographic offset presses and/or digital output devices. These principles are used to make decisions regarding page layout, typeface selection, graphics and working with color. Extensive study of typography as it applies to design will be covered through hands-on projects as well as an introduction to raster graphics using Adobe Photoshop. Department consent required.

10-204-144 Adobe Illustrator (3 cr.)
Introduces illustration software. Students use vector-drawing tools to trace and create objects, merge, layer, fill and trap to form printable art. This hands-on course uses the latest software available.

10-204-145 Color Theory (2 cr.)
Introduces the subtractive (CMYK) and additive (RGB) color theories and shows students how their perception of color is affected by light, ink, paper and press mechanics. Also presented is information on color measurement and matching, proofing and reproduction limitations.

10-204-146 Adobe Photoshop (3 cr.)
Provides hands-on training in the use of Adobe Photoshop to produce and edit line art, black & white and color photographs for use in lithographic offset printing and/or digital output devices. Extensive hands-on practice manipulating raster images using many of the features of Adobe Photoshop is provided. Includes file formats and resolution.

10-204-147 Offset Presswork - A (3 cr.)
Introduces students to the fundamental concepts of sheet-fed offset press systems and operations. Students print various single color forms on small format offset presses. Web-offset presses are also discussed. Safety in the work environment is stressed. Department consent required.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-204-148</td>
<td>Offset Presswork - B (3 cr.)</td>
<td>Covers the operation of small and medium format offset presses and expands on the details of sheet-fed press systems. Students print two and four-color forms on small and medium format offset presses. Safety in the work environment is stressed.</td>
</tr>
<tr>
<td>10-204-150</td>
<td>Production Printing 1 (3 cr.)</td>
<td>Gives students the opportunity to fully understand the entire offset reproduction process by forming teams and completing print jobs utilizing pre-press, press and print finishing skills. Each team is responsible for identifying production requirements and producing jobs to provided specifications. Emphasis will be on one- and two-color work.</td>
</tr>
<tr>
<td>10-204-151</td>
<td>Emerging Technologies - Printing Industry (2 cr.)</td>
<td>Studies technological change that the graphic arts and allied industries are currently experiencing. Adobe InDesign, Adobe Acrobat and other technological advances will be explored through individual and team activities, including self-study and practical application of the new technologies.</td>
</tr>
<tr>
<td>10-204-155</td>
<td>Production Printing 2 (3 cr.)</td>
<td>Gives students the opportunity to fully understand the entire offset reproduction process by forming teams and completing print jobs utilizing prepress, press and print finishing skills. Each team is responsible for identifying production requirements and producing jobs to provided specifications. Emphasis will be on four-color work.</td>
</tr>
<tr>
<td>10-204-160</td>
<td>Package &amp; Label Printing Technician Internship (4 cr.)</td>
<td>Enables students to learn the flexographic process through actual employment with sponsor converters and printers with the assistance of a supervising instructor. Students will gain experience directly related to their area of study. They will also attend one-hour seminars to discuss their experiences in this on-the-job training program.</td>
</tr>
<tr>
<td>10-204-175</td>
<td>Flexo Prepress Introduction (5 cr.)</td>
<td>Introduces students to the Flexographic Printing industry. It focuses on history, terminology, standards, workflows, computer skills and software overviews. Students will prepare basic files for output as well as learn how to preflight previously made files.</td>
</tr>
<tr>
<td>10-204-176</td>
<td>Flexo Prepress 1 (5 cr.)</td>
<td>Teaches students how to use software packages for illustration, photo editing, trapping and outputting. Students will use the software to build spot as well as process files. Topics such as color management and workstation trapping/outputting and color correction will be used by students.</td>
</tr>
<tr>
<td>10-204-177</td>
<td>Flexo Prepress 2 (5 cr.)</td>
<td>Building on previous course work, students will be using more advanced techniques on current prepress software. Techniques such as press fingerprinting, multiple line screens/dot shapes and creating files for transparent substrates will be included.</td>
</tr>
<tr>
<td>10-204-178</td>
<td>Flexo Prepress 3 (5 cr.)</td>
<td>Building on previous course work, students will be using additional advanced techniques using current prepress software. Techniques such as common plate file building, photo manipulation, preflighting/troubleshooting files and working with press students to make projects run on press to industry standards.</td>
</tr>
<tr>
<td>10-204-179</td>
<td>Advanced Prepress Techniques (5 cr.)</td>
<td>Requires students to work with press students in a production style environment, building and outputting digital files for production, troubleshooting and correcting any problems that may occur during the press runs. Students will be introduced to building files for corrugated presses and setting up print cards and 3-D rendering of packages.</td>
</tr>
<tr>
<td>304 Housing &amp; Home Furnishings</td>
<td></td>
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<tr>
<td>10-304-107</td>
<td>Interior Design Study Tour (1 cr.)</td>
<td>Increases the students' awareness and appreciation of furnishings, design, architecture and the arts. Students view furnishing collections and survey and study architectural details and historic sites. Additional cost of trip.</td>
</tr>
<tr>
<td>10-304-110</td>
<td>Fundamentals of Design (3 cr.)</td>
<td>Provides a foundation in the principles and elements of design. The understanding of good design, taste and creativity is stressed in student projects. Students use their projects in a design show.</td>
</tr>
<tr>
<td>10-304-123</td>
<td>Commercial Design (1 cr.)</td>
<td>Introduces the commercial aspects of design, office planning, office landscaping, and job specification.</td>
</tr>
</tbody>
</table>
Course Descriptions

10-304-124 Commercial CAD - 1 Credit (1 cr.)
Introduces the principles of computer-aided design and planning. Students develop floor plans and design workstations and open office systems.

10-304-125 Basic Interior Design (3 cr.)
Focuses on the basic elements, materials, and mathematics of interior design. Topics include furniture arranging and the treatment of windows, walls and floors.

10-304-126 Reupholstery (2 cr.)
Studies manufacturers’ upholstery methods and presents the techniques of upholstering and the art of reupholstering. Students reupholster a furniture piece.

10-304-127 Color Theory (3 cr.)
Explores the basic principles of color. Color harmonies are correlated with practical problems as they apply to interior design. Students present their plans, selection of furnishings and colors for group discussion and critique.

10-304-128 Commercial CAD (2 cr.)
Introduces the principles of computer-aided design and planning. Students develop floor plans and design workstations and open office systems.

10-304-129 Textiles (3 cr.)
Studies textiles as they appear in interiors, taking the student from fiber to fabric. Topics include fibers, yarns, fabric construction, finishes and decorating techniques. Emphasis is on selection, care, use and textile legislation as related to the field of interior design.

10-304-130 Window Treatment/Drapery Making (1 cr.)
Focuses on three fabrication projects provided by students. This hands-on course includes instruction of window treatments from measurements of the window and fabric and hardware selection through construction. Basic sewing skills are helpful.

10-304-131 Drafting for Interior Design (2 cr.)
Introduces the techniques and language of architectural drafting and construction. Basic floor plan and elevation drafting is practiced.

10-304-134 Advanced Interior Design (2 cr.)
Introduces advanced techniques for the design and calculation of draperies, bedding, kitchen and bath projects using workroom forms and computerized drawings.

10-304-135 Business Principles for Interior Design (1 cr.)
Presents the business aspects of a career in interior design. Topics include business forms, billing procedures and business setup.

10-304-137 Visual Display (2 cr.)
Explores displays and vignettes used in the commercial and residential design business. This course is a practicum for construction of these types of displays.

10-304-138 Internship 1, Interior Design (4 cr.)
Explores interior design careers. This internship provides experience in the field of interior design.

10-304-139 Accessories (2 cr.)
Covers the selection and display of accessories in designing residential and commercial interiors. It provides instruction in matting and framing techniques and in creating floral displays, wall groupings and table settings.

10-304-140 Internship 2, Interior Design (4 cr.)
Explores a variety of interior design careers and gives students practical experience in the field.

10-304-143 Design Applications (3 cr.)
Applies previous course learning experiences to hypothetical residential and commercial design problems. Board layouts and oral presentations accompany each solution.

10-304-144 History of Furniture (3 cr.)
Examines the history of art, architecture and furnishings from early Egypt through the Western World of the 20th century. Special attention is given to European court styles and the decorative arts of Colonial America.

10-304-145 Illustration (2 cr.)
Includes the techniques and principles necessary for successful visual presentations. Students practice coloration, pattern depiction, and shading of floor plans, elevations and perspectives.

10-304-146 Perspective Drawing (1 cr.)
Introduces the theory of perspective drawing of interior spaces. Sketching techniques and perspective grids are used to create basic three-dimensional drawings of rooms.

10-304-149 Kitchen and Bath Planning (1 cr.)
Emphasizes the basics of kitchen and bath design. Students depict visualizations of these rooms using hand-drawn and computerized work. This course is offered to students wishing to specialize in kitchen or bath design.
10-304-150 Computer Basics for Design (1 cr.)
Introduces interior design software. This course covers computer hardware, printers, data storage materials and using the mouse. Students create and save design files and folders, plot or print, and do page setup using desktop icons, menus, toolbars and basic Windows functions.

10-304-151 Wall Finishes (1 cr.)
Explores the latest trends in painting techniques and wall coverings. Topics include paint mixing and application, finish manipulation, and wall covering selection, calculation and application. Students use a simulation lab.

10-304-152 Flooring (1 cr.)
Helps the student with a special interest in carpet and flooring gain a further knowledge of flooring types and materials. Students practice planning layouts effectively and accurately. Selling tips are discussed.

10-304-153 Basic Kitchen and Bath (3 cr.)
Provides students with the understanding of design elements and principles for kitchen and bath, including functions of the kitchen and bath as it relates to the house and its occupants. Application and knowledge of the NKBA Planning Guidelines, including assessment, measurement, product selection and communication of design will be introduced and applied to projects.

10-304-154 Construction Applications - Mechanical & Lighting (3 cr.)
Demonstrates knowledge of standard building terms, mechanical, electrical, plumbing, heating and cooling systems. Students will become aware of communication with the trades, building changes as they relate to cost and specify materials to satisfy design criteria.

10-304-155 Business Procedures for Designers (3 cr.)
Includes demonstration of ethical business practices, including the NKBA standards of conduct and NKBA business contracts, business tools and forms. Students will have an understanding of management policies, including profit margin, business plan development, HR practices, marketing and advertising.

10-304-156 Advanced Kitchen & Bath Design (3 cr.)
Approaches solutions to advanced knowledge of NKBA Planning Guidelines. Course work will include universal design projects, mastery of solving problems, developing concept and theme design, producing professional working documents according to the NKBA Graphic and Presentation Standards. Students will produce floor plans, elevations, mechanical and construction drawings.

10-304-157 Materials & Estimating (3 cr.)
Utilizes knowledge of appropriate cabinetry, appliances, ventilation, decorative plumbing and hardware, including surface and decorative materials. Students will competently research, estimate, recommend and order materials using product specification sheets.

10-304-160 Project Development - Commercial Design (2 cr.)
Management of the commercial project is emphasized. Communication with the client for data gathering, space planning, schedules and costing a project are stressed.

10-304-161 Advanced CAD (2 cr.)
Emphasis on the use of CAD (Computer Aided Design) as a means of determining project and client needs. Production of both two- and three-dimensional drawings will be used in the construction and presentation phases of the project.

10-304-162 Furnishings & Materials - Commercial Design (1 cr.)
Selection and presentation of furnishings and materials for commercial interiors are explored. These selections are based on projects where client requests, aesthetics, equipment technology and physical space are factors.

10-304-163 Lighting (1 cr.)
Determination of how lighting affects interior environments is explored. Light fixtures and artificial lighting sources are analyzed and planned for both residential and commercial interiors.

10-304-164 Sketching for Interior Design (1 cr.)
Drawing exercises will include various approaches to perspective. The visual learner will gain understanding of perspective through methods geared toward drawing what you see. The graphic or analytical learner will use a method of calculated use of points and lines. Timed exercises will be used to increase confidence in freehand drawing skills.

10-304-165 SketchUp (1 cr.)
Explores the use of the Google SketchUp software for creating virtual 3-D models of architectural elements and interior spaces. Using various design, rendering, and visualization features available in the software the learner will be able to produce presentation-quality materials and portfolio-ready graphics. The course will also cover the basics of virtual walkthrough and animation in the 3-D environment. Familiarity with computers and Microsoft Windows is required.
307 Early Childhood Education

10-307-111 Movement and Music for Children (3 cr.)
Presents movement activities to help children develop sensory awareness, songs and rhythms to use in developing skills and concepts, and ways to help children have fun and learn through movement and music.

10-307-141 School Age Child Care (3 cr.)
Provides an overview of the unique characteristics of quality out-of-school programs designed for youth 5-12 years of age. Areas of focus include understanding developmental characteristics; exploring school age environments; planning and implementing age-appropriate curriculum and activities; and developing strategies and techniques for guiding children’s positive behavior. Students will observe out-of-school programs throughout the course in order to foster a deeper understanding of these unique programs.

10-307-148 ECE: Foundations of ECE (3 cr.)
Introduces students to the early childhood profession. Course competencies include: integrate strategies that support diversity and anti-bias perspectives; investigate the history of early childhood education; summarize types of early childhood education settings; identify the components of a quality early childhood education program; summarize responsibilities of early childhood education professionals; and explore early childhood curriculum models.

10-307-151 ECE: Infant & Toddler Dev (3 cr.)
Teaches infant toddler development as it applies to an early childhood education setting. Course competencies include: integrate strategies that support diversity and anti-bias perspectives; analyze development of infants and toddlers (conception to three years); correlate prenatal conditions with development; summarize child development theories; analyze the role of heredity and the environment and more.

10-307-157 Child Care Independent Study 1 (1 cr.)
Offers experiences relating to issues in Early Childhood Education. Department consent required.

10-307-166 ECE: Curriculum Planning (3 cr.)
Examines the components of curriculum planning in early childhood education. Course competencies include: integrate strategies that support diversity and anti-bias perspectives; examine the critical role of play; establish a developmentally appropriate environment; examine caregiving routines as curriculum; develop activity plans that promote child development and learning and more.

10-307-167 ECE: Hlth Safety & Nutrition (3 cr.)
Examines the topics of health, safety and nutrition within the context of the early childhood educational setting. Course competencies include: integrate strategies that support diversity and anti-bias perspectives; follow governmental regulations and professional standards as they apply to health, safety and nutrition; provide a safe early childhood program and more.

10-307-174 ECE: Practicum 1 (3 cr.)
Applies the learned course competencies in an actual child care setting. The course competencies include: document children's behavior; explore the standards for quality early childhood education; explore strategies that support diversity and anti-bias perspectives; implement activities developed by the co-op teacher/instructor; demonstrate professional behaviors; practice caregiving routines as curriculum and more.

10-307-178 ECE: Art Music & Lang Arts (3 cr.)
Focuses on beginning level curriculum development in the specific content areas of art, music and language arts. Course competencies include: integrate strategies that support diversity and anti-bias perspectives; examine the critical role of play; establish a developmentally appropriate environment; develop activity plans that promote child development and learning and more.

10-307-179 ECE: Child Development (3 cr.)
Examines child development within the context of the early childhood education setting. Course competencies include: analyze social, cultural and economic influences on child development; summarize child development theories; analyze development of children ages three through eight; summarize the methods and designs of child development research and more.

10-307-180 Administration/Supervision-Early Childhood (3 cr.)
Prepares participants to receive a certificate in childcare administration from FVTC and a credential as a childcare administrator from the Registry. This course includes an overview of the roles and responsibilities of directors, coordinators, supervisors and other administrators in early childhood programs. Must be a lead teacher or program director.

10-307-181 Managing Finances/Planning-Early Childhood (3 cr.)
Includes a review of principles and practices of budget planning, budget preparation and fiscal management. Must be a lead teacher or program director.
10-307-182 Operations Management-Early Childhood (3 cr.)
Includes discussion and practical applications related to scheduling, staffing, facilities management, equipment acquisition and maintenance, service delivery, maintaining records and communication. Must be a lead teacher or program director.

10-307-183 External Environments-Early Childhood (3 cr.)
Examines the external factors and relationships which affect early childhood program quality and ability to flourish. Content includes how to conduct surveys, basic marketing principles, licensing and accreditation requirements, collaboration with other organizations, developing funding resources, advocacy, and working for and with change. Must be a lead teacher or program director.

10-307-184 Best Practices/Young Children & Families (3 cr.)
Includes information for establishing and maintaining quality programs based on professional standards and using the best available information on child growth and development in order to provide a family friendly service. Must be a lead teacher or program director.

10-307-185 Administrative Seminar-Early Childhood (3 cr.)
An advanced course in the six-course series required to receive a credential as a childcare administrator from The Registry and/or a certificate in childcare administration from FVTC. Major individual projects are required with a focus on integration of program aspects in developing strategies planning for change.

10-307-187 ECE: Children w Diff Abilities (3 cr.)
Focuses on the child with differing abilities in an early childhood education setting. Course competencies include: integrate strategies that support diversity and anti-bias perspectives; provide inclusive programs for young children; apply legal and ethical requirements including, but not limited to, ADA and IDEA and more.

10-307-188 ECE: Guiding Child Behavior (3 cr.)
Examines positive strategies to guide children’s behavior in the early childhood education setting. Course competencies include: integrate strategies that support diversity and anti-bias perspectives; summarize early childhood guidance principles; analyze factors that affect the behavior of children; practice positive guidance strategies; develop guidance strategies to meet individual needs; and create a guidance philosophy.

10-307-192 ECE: Practicum 2 (3 cr.)
Applies the learned course competencies in an actual child care setting. The course competencies include: identify children’s growth and development; maintain the standards for quality early childhood education; practice strategies that support diversity and anti-bias perspectives; implement student teacher-developed activity plans; identify the elements of a developmentally appropriate environment and more.

10-307-194 ECE: Math Science & Soc St (3 cr.)
Focuses on beginning level curriculum development in the specific content areas of math, science and social studies. Course competencies include: integrate strategies that support diversity and anti-bias perspectives; examine the critical role of play; establish a developmentally appropriate environment; develop activity plans that promote child development and learning; create developmentally appropriate science activities and more.

10-307-195 ECE: Family & Community Rel (3 cr.)
Examines the role of relationships with family and community in early childhood education. Course competencies include implement strategies that support diversity and anti-bias perspectives when working with families and community; analyze contemporary family patterns, trends and relationships; utilize effective communication strategies; establish ongoing relationships with families and more.

10-307-196 ECE: Transition to the University Experience (3 cr.)
Focuses focus on making the transition to a baccalaureate degree, portfolio completion. It is planned that successful completion of this course will grant students admission into the Professional Education Program at the University of Wisconsin-Oshkosh. An Associate Degree in Early Childhood Education is required.

10-307-197 ECE: Practicum 3 (3 cr.)
Applies the learned course competencies in an actual child care setting. The course competencies include: assess children’s growth and development; implement the standards for quality early childhood education; integrate strategies that support diversity and anti-bias perspectives; build meaningful curriculum; provide a developmentally appropriate environment; facilitate positive guidance strategies and more.
10-307-198 ECE: Admin an ECE Program (3 cr.)
Focuses on the administration of an early childhood education program. Course competencies include: integrate strategies that support diversity and anti-bias perspectives; analyze the components of an ECE facility; design an ECE program; analyze the aspects of personnel supervision; outline financial components of an ECE program; apply laws and regulations related to an ECE facility; and advocate for the early childhood profession.

10-307-199 ECE: Practicum 4 (3 cr.)
Applies the learned course competencies in an actual child care setting. Course competencies include: analyze children's growth and development based on assessment; integrate strategies that support diversity and anti-bias perspectives; promote professional behaviors and practices; implement meaningful curriculum; create respectful, reciprocal relationships; evaluate early childhood education programs for quality and more.

316 Culinary Arts

10-316-101 Food Production, Introduction to (3 cr.)
Introduces quantity food production to the non-culinary student. Topics include preparation of a variety of menu items, equipment use, plate presentation, recipe conversion, menu analysis and the essentials of timing and coordination of service.

10-316-103 Pantry Production (1 cr.)
Provides the learner with practical applications of fundamentals utilized in the pantry kitchen. Included in this course are the preparation of temporary and permanent emulsions, salad dressing, salad greens, fruits, vegetables, cheeses, cold meats and platter presentations.

10-316-104 Soup & Stock Production (1 cr.)
Introduces the preparation of clear, cream, puree and specialty soups. Students prepare basic stocks and evaluate convenience soups and stocks for quality and cost.

10-316-105 Comfort Food Production (1 cr.)
Introduces quantity food preparation procedures with emphasis on braising, stewing, simmering, roasting, baking and sauce making. Practical experience is given in banquet, restaurant and cafeteria food presentation techniques.

10-316-106 Complex Carbohydrates (1 cr.)
Introduces the identification and preparation of a variety of grains, legumes, potatoes and farinaceous products to bring variety and nutritional balance into restaurant, catering and institutional menus.

10-316-107 Heart Healthy Cuisine & Light Sauces (1 cr.)
Introduces quantity food preparation methods associated with reduced-fat cooking with emphasis on sauteing, broiling/grilling, poaching/steaming, stir-frying and pan-smoking. Computer-based nutritional analysis of recipes is applied.

10-316-110 Culinary Fundamentals (3 cr.)
Applies the basic principles involved in the purchase, preparation and use of food stuffs. The proper identification and use of equipment and correct measuring techniques are covered. This course provides the theory basis for production courses taken during the first semester.

10-316-111 Vegetables and Vegetarian (1 cr.)
Introduces the learner to the identification, selection and application of a variety of meatless and vegetable preparation techniques. Emphasis is given to lacto-ovo and vegan disciplines, with proper preparation and selection of vegetables for retention of nutrients, color and plate presentation.

10-316-112 Baking, Principles of (1 cr.)
Introduces basic baking principles and procedures and yeast-made products, cakes, pies and icings. Emphasis is on the products used in baking and their characteristics.

10-316-113 Breakfast Cookery and Trends (1 cr.)
Provides hands-on experience in all phases of short-order techniques. Students use grills to prepare a variety of eggs, omelets, pancakes and breakfast meats. They also set up a brunch line.

10-316-114 Garde Manger (1 cr.)
Provides practical experience in preparing salad dressings, salad greens and vegetables. Storage and standards of quality and seasonal conditions relating to vegetable and fruits are emphasized.

10-316-115 Lunch Cookery and Trends (1 cr.)
Introduces lunch cookery through the use of grills, fryers, ovens and steamers. Service experience includes cafeteria line work and fast food delivery. Instruction is also given in safety and sanitation methods.

10-316-116 Deli Operations (1 cr.)
Presents the basics of deli operations including food preparation, food rotation, and inventory control and profit. The marketing aspect is also discussed.
10-316-117 Convenience Bakery (1 cr.)
Explores how to prepare and evaluate various convenience bakery products. Quality, cost, preparation methods and variety are emphasized.

10-316-118 Sanitation for Food Service Operations (1 cr.)
Focuses on the development of skills to follow sanitation and hygiene provisions in state codes. The NRA certification test is included.

10-316-119 Nutrition for Culinary Arts (1 cr.)
Focuses on the six major nutrients (carbohydrates, proteins, fats, minerals, vitamins and water) and how each is used by the body. The planning of well-balanced diets and the nutritional analysis of diets are emphasized.

10-316-120 Culinary Applications (2 cr.)
Builds upon basic food principles learned in Culinary Fundamentals (10-316-110) and provides the theory basis for production courses taken in the second semester.

10-316-123 Hospitality Supervision (3 cr.)
Introduces fundamental management techniques including leadership styles; interpersonal skills; planning, organizing and decision-making processes, as well as interviewing, hiring, training and evaluating employees.

10-316-124 Culinary Skills Development (1 cr.)
Includes the observation and application of basic cooking patterns by proportion. These patterns include stocks, soups, sauces, dry heat and moist heat applications, vegetable applications, grains, pasta and potato applications. Department consent required.

10-316-129 Professionalism, Ethics and Etiquette (1 cr.)
Explores the expectations of professionalism in the fields of culinary arts and hospitality. Students examine moral and ethical situations that can confront culinary and hospitality employees. Students also consider business etiquette and career planning.

10-316-133 Meat Identification (1 cr.)
Focuses on the federal program for meat and fish inspection. Meat grading classification (commercial and institutional) and purchasing are discussed. This course also provides practical lessons in meat preparation. Department consent required.

10-316-134 Restaurant Operations - Preparation (4 cr.)
Applies the principles and procedures of kitchen food preparation to a restaurant operation. This course covers production through service, including dining room management, catering and restaurant cooking. Department consent and second-year standing in the program is required.

10-316-135 Restaurant Operations - Service (2 cr.)
Applies the principles and procedures of food preparation to a restaurant operation. This course covers production through service, including dining room management, catering and restaurant cooking. Department consent and second-year standing in the program is required.

10-316-141 Food, Beverage and Labor Cost Controls (3 cr.)
Covers the concepts and techniques of controlling costs with particular emphasis placed on the cost-to-sales relationship. Students calculate the cost of goods, selling price and relative percentages. They also forecast sales, conduct yield analyses and calculate break-even points.

10-316-142 Catering and Special Event Planning (2 cr.)
Introduces how to develop, plan and execute catering and special events to the exacting details of the customer. Emphasis is on the importance of details in planning to achieve the best possible results. Activities will encourage both creative thinking and functionality to ensure customer satisfaction and business profitability.

10-316-150 Food Service Independent Study (1 cr.)
Gives credit for a variety of educational explorations outside the traditional classroom setting. These activities include attending conferences and completing special courses and projects.

10-316-151 Asian Cuisine (1 cr.)
Focuses on the preparation of foods from the Far East. The five regional styles of cooking in China are covered: Szechwan, Hunan, Fukien, Peking and Cantonese. Learners study the ingredients used in both Chinese and Japanese cooking, the utensils and how foods are presented.

10-316-152 European Cuisine (1 cr.)
 Applies cooking principles specific to the cuisine of Europe, Asia, Africa and South America. Food traditions and customs are emphasized.

10-316-153 Planning a Major Catered Event (1 cr.)
Introduces how to plan, implement and evaluate a special event. Menu planning, costing and food themes are covered.
Course Descriptions

10-316-154 Ice Carving (1 cr.)
Covers the ice carving techniques used in on-premise catering. Each student completes an ice carving project.

10-316-157 Culinary Competition (1 cr.)
Introduces students to the rules and regulations of culinary competition. Emphasis is on food styling concepts that meet the American Culinary Federation’s judging standards. As a final project, students compete in the WRA student culinary arts salon.

402 Aeronautics

10-402-101 Aeronautics Science Private (3 cr.)
Focuses on the principles of flight and the basics of air traffic control, weather facts, navigational procedures and airplane operation. Upon successful completion, the student is prepared for the Federal Aviation Administration’s written examination for the Private Pilot Certificate.

10-402-102 Aeronautics/Aviation Weather (3 cr.)
Covers the basic concepts of aviation meteorology including temperature, pressure, moisture, stability, clouds, air masses, fronts, thunderstorms, icing and fog. Analysis and use of weather data for flight planning and safe flying, and interpretations of U.S. Weather Bureau maps, reports and forecasts are discussed.

10-402-103 Aeronautics Science Instrument (3 cr.)
Introduces students to concepts basic to the process of instrument interpretation, aircraft control and navigation, and regulatory compliance while flying in instrument meteorological conditions.

10-402-104 Aeronautics Science Commercial (3 cr.)
Covers the elements of air navigation, pilotage, dead reckoning, radio navigation and the use of aerial charts and Federal Aviation Administration publications.

10-402-105 Aerophysics - Aerodynamics (3 cr.)
Teaches the principles of physics as applied to flight topics of velocity and acceleration, and their application to aircraft takeoff and landing performance. Lift, thrust, drag and gravity relationships in accelerated and unaccelerated flight are included.

10-402-106 Aeronautics Engine Structure Systems (3 cr.)
Focuses on the principles of aircraft engine theory and operation including construction, lubrication, carburetion, ignition, supercharging and propellers. The principles of aircraft structures are covered including basic stresses, types of construction and the advantages of each type. Federal Aviation Administration repair procedures are discussed.

10-402-107 Aeronautics Science C.F.I. (3 cr.)
Provides the Certified Flight Instructor (CFI) with sound methods of instruction. Emphasis is on the learning process, instructional process, aerodynamics, airplane instruments, flight maneuvers and Federal Aviation Administration regulations.

10-402-108 Aero Science-Multi Engine Land (2 cr.)
Focuses on the basic concepts and principles of two engine flight characteristics and their application in aircraft operations. Topics include aircraft systems, Velocity Minimum Control concepts, performance charts and flight procedures.

10-402-110 Aircraft Instrument Systems (3 cr.)
Operating principles and use of aircraft instrumentation will be introduced on pressure, gyroscopic, and direction indicating. Studies include operation and use of electronic systems for Flight Instrument, Attitude Direction Indicator, and Monitoring displays such as Centralized Aircraft Monitoring, Engine Indicator and Crew Alerting Systems. Engine instrument systems and components will be inspected to include troubleshooting procedures.

10-402-111 Basic Avionics Systems (3 cr.)
Introduces avionics systems which will provide the student with the knowledge to understand the operation of communication and navigation components and systems. Emphasis is on familiarization with avionics systems used on aircraft and how these systems are utilized by the flight crew. Avionics systems introduce the following: Very High Frequency Omnidirectional Range (VOR), Instrument Landing Systems (ILS), Marker Beacon, Long-Range Navigation (LORAN C), Automatic Direction Finder (ADF), Distance Measuring Equipment (DME), Area Navigation (RNAV), Global Position Systems (GPS), Very High Frequency Communication Systems (VHF Com.), Audio Control Systems, Radar Altimeters, Transponders, Traffic Alert and Collision Avoidance Systems (TCAS), and Weather Radar Systems.
10-402-112 Materials and Installation (3 cr.)
Introduces aerospace materials, hardware and processes. Students study the proper use of hand and power tools and precision measuring equipment. Safety is emphasized. Students do hands-on activities in sheet metal layout, bending and forming and install antennas and avionics equipment. They identify and inspect finishing materials.

10-402-114 Avionics Communications (3 cr.)
Is the study of integrated communication systems typically used in general, corporate and commercial aviation aircraft. Very High Frequency Communication (VHF Com.), High Frequency Communication (HF Com.), Ultra High Frequency Communication (UHF Com.), Audio Control Systems, Selective Calling (SELCAL), Satellite Communications (SATCOM) and Transmitter Systems are emphasized in both the lecture and laboratory activities. The laboratory work provides in-depth, hands-on training in identifying, isolating, repairing and calibrating avionics communication systems with the use of standard avionics communication test equipment.

10-402-123 FCC License, Preparation for (1 cr.)
An overview of the topics addressed in the first year of the Aircraft Electronics program. The student will study the necessary elements to prepare and write the Federal Communication Commission’s General Radiotelephone Operator's License exam.

10-402-124 Aeronautics, Introduction to (3 cr.)
Provides an overview of aviation including the principles of flight. This course introduces aircraft systems and performance, navigation, basic meteorological concepts, aviation safety and specific regulations. The social and environmental impacts of aviation are discussed.

10-402-140 Avionics Control Systems (2 cr.)
Studies the operation and use of Air Data Systems, Flight Director Systems, Autopilot Systems and Attitude and Heading Reference System (AHRS). The course examines the characteristics and integration of these systems and the control of the aircraft in flight. Emphasis is on aircraft control surfaces and information sources used to fly the aircraft. Laboratory activities provide practical application of servo, synchro slaved compass systems, flight director and autopilot systems.

10-402-143 Avionics Surveillance Systems (3 cr.)
A study of integrated surveillance avionics systems typically used in general, corporate and commercial aviation aircraft. Transponders, Traffic Alert and Collision Avoidance Systems (TCAS), Enhanced Ground Proximity Warning System (GPWS), and Weather Radar Systems are studied. The course stresses an understanding of each system's operation and use by the flight crew. Identifying, isolating, repairing and calibrating the systems, within the guidelines established by the manufacturer, are emphasized in the laboratory activities.

10-402-144 Installation Project 1 (1 cr.)
The student will utilize procedures for installation and removal of avionics electronic equipment on aircraft. The student will use federal rules and regulations; procedures for equipment layouts; proper installation of cable runs; proper use of sheet metal including cutting, bending and fabrication using the correct fasteners; maintenance records; and procedures used to properly compute weight and balance to complete an installation project.

10-402-145 Installation Project 2 (1 cr.)
A continuation of Installation Project 1 for completion of a more in-depth project. Students utilize procedures for installation and removal of avionics electronic equipment on aircraft. They will also use federal rules and regulations; procedures for equipment layouts; proper installation of cable runs; proper use of sheet metal including cutting, bending and fabrication using the correct fasteners; maintenance records; and procedures used to properly compute weight and balance to complete an installation project.

10-402-146 Installation Project 3 (1 cr.)
A continuation of Installation Project 2. Students utilize procedures for installation and removal of avionics electronic equipment on aircraft. They also use federal rules and regulations; procedures for equipment layouts; proper installation of cable runs; proper use of sheet metal including cutting, bending and fabrication using the correct fasteners, maintenance records and procedures used to properly compute weight and balance to complete an installation project.

10-402-160 Aircraft Electrical Power (3 cr.)
Introduces aircraft power sources and starting systems. Students complete maintenance and troubleshooting on batteries, generators, alternators and starters. Aircraft electric motor operation and systems application are also covered.
10-402-161 Aviation Regulations & Publications (2 cr.)
Studies FAA and manufacturers' publications. FAA regulations for certification, maintenance and aircraft airworthiness are reviewed. Students identify FAA-approved publications and procedures to perform maintenance to an airworthy standard including aircraft record requirements.

10-402-163 Aircraft Electrical Systems (3 cr.)
Aircraft electrical systems and component operation will be introduced. Projects will allow students to develop skills in wiring installation, termination, repairs and inspection of systems. Maintenance of controls, switches, indicators and protective devices will be introduced to develop servicing and troubleshooting skills.

10-402-166 Maintenance Forms & Records (1 cr.)
Students will understand the application of Federal Aviation Regulations and requirements for aircraft maintenance records. Maintenance record entry procedures and details required for various operations will be introduced. Requirements and procedures for completion of FAA forms and documentation for Major Repairs, Inspections, and Weight & Balance records will be covered. Typical industry work order, parts tagging, time controlled parts and inspection monitoring will be identified.

10-402-167 Technical Drawings & Diagrams (1 cr.)
Students will read and use aircraft blueprints, draw sketches of aircraft repairs and alterations. Identify symbols and utilize schematic diagrams, graphs and charts in specific applications. Apply troubleshooting skills to systems with the use of electrical wiring diagrams.

10-402-168 Human Factors (1 cr.)
Maintenance resource management issues are introduced. The study of airline safety, human error in maintenance, human factors fundamentals, worker safety, communication, team work, situation awareness, and performance management.

10-402-169 Avionics Navigational Systems (3 cr.)
A study of integrated navigational avionics systems typically used in general, corporate and commercial aviation aircraft. VHF Omni direction Range (VOR), Instrument Landing Systems (ILS), Marker Beacon, Global Positioning System (GPS) and Distance Measuring Equipment (DME) are emphasized in both the lecture and laboratory activities. The laboratory work provides in-depth, hands-on training in identifying, isolating, repairing and calibrating avionics systems with the use of standard avionics test equipment.

10-402-183 Aeronautics Internship (1 cr.)
Available to students of the Aeronautics-Pilot Training program. This independent study course is tailored to each student's needs and situation. Students interested in enrolling must meet with the program internship coordinator to formulate specific course objectives based on the type, location, depth and utility of the internship activity in relation to the student's overall academic experience. Department consent required.

10-402-185 Avionics for Pilots (2 cr.)
Offers an introduction to the principles and operation of the electronic systems found in contemporary airplanes. Emphasis is on the operational capabilities and limitations of the equipment as well as recognition and communication of operational malfunctions.

10-402-191 Aeronautics Private Pilot (3 cr.)
Introduces students to flight and prepares them to solo and practice for the Private Pilot Flight Test.

10-402-192 Aeronautics Flight Commercial 1 (3 cr.)
Introduces the private pilot to more advanced piloting maneuvers and covers the day/night cross-country navigational skills needed for commercial air operations.

10-402-193 Aeronautics Flight Instrument (3 cr.)
Enables the student to gain the required skills for instrument flight in an airplane.

10-402-194 Aeronautics Flight Commercial 2 (3 cr.)
Addresses advanced piloting maneuvers and allows pilots to hone their flying skills to a higher level demanded by the standards of the FAA Commercial Multi Engine and Single Engine Pilot Flight Test.

10-402-195 Aeronautics Flight CFI-ASE (3 cr.)
Prepares the experienced pilot for the Federal Aviation Administration's Flight Instructor Certificate for airplanes.

10-402-196 Aeronautics Flight Multi-Engines (1 cr.)
Focuses on the aeronautical skills and experience required for an airplane multi-engine land class rating.

10-402-197 Aeronautics Multi-Engine Instructor (2 cr.)
Prepares the flight instructor for the addition of a multi-engine class rating to his/her instructor certificate. It includes 15 hours of multi-engine flight time, pre- and post-flight discussion and lecture.
10-402-198 Aeronautics CFI-I (1 cr.)
Prepares the Certified Flight Instructor (CFI) for the addition of a Certified Flight Instrument Instructor (CFII) class rating to his/her instructor certificate.

10-402-199 Professional Flight Crew Operations (2 cr.)
Prepares the pilot to function effectively in a crew environment while overcoming and adapting to a variety of operational variables such as weather, mechanical, and ground crew delays, system malfunctions, re-routes, aircraft swaps, various scenarios, duty time expirations, along with many other valuable learning experiences all while adhering to a scheduled trip. The successful student will have increased adaptation skills and real world critical thinking skills.

32-402-310 Aircraft Powerplants 1 (4 cr.)
Covers aircraft powerplants dealing with the theory of internal combustion engines (reciprocating overhaul). Students will disassemble, clean, inspect and reassemble engines. The theory of operation, inspection techniques and tools, the proper use of manuals and the application of FAR's to engine overhaul and maintenance also are included.

32-402-315 Powerplant Systems 1 (3 cr.)
Covers the principles of fire protection and induction and exhaust systems including maintenance, inspection and troubleshooting of components and systems.

32-402-316 Powerplant Systems 2 (2 cr.)
Outlines aircraft ignition systems. Students learn about aircraft magneto, turbine ignition, high and low tension ignition systems, and the construction and functioning of the aircraft sparkplug. Appropriate FAA regulations and the use of manufacturers' manuals are stressed.

32-402-320 Aircraft Materials/Processes (4 cr.)
Explains nondestructive test methods including magnetic particle, fluorescent and dye penetrants, ultrasonic, and eddy current testing. Students also learn about aircraft corrosion control and painting.

32-402-322 Aircraft Systems 1 (2 cr.)
Teaches students the principles of cabin atmosphere control and fuel systems. Typical systems are studied using aircraft maintenance installation and the overhaul of various components. Included is the study of vacuum, de-icing, oxygen and airframe fuel systems.

32-402-323 Aircraft Systems 2 (4 cr.)
Focuses on aircraft hydraulic, pneumatic, and fire detection and protection systems. It also covers basic principles and system designs, the purpose and functioning of the individual units, and maintenance overhaul and testing of units and systems.

32-402-326 Structural Materials (3 cr.)
Students will learn to apply basic concepts of inspection and maintenance of wood aircraft structures and fabric covering. The development and industry integration of advanced composite materials will be introduced. Extensive hands on projects with composite materials will use vacuum bag techniques with heat application in repairs of composite materials. Inspection and maintenance of aircraft plastics will be experienced.

32-402-327 Maintenance and Service (3 cr.)
Focuses on the techniques of servicing and repairing aircraft and the systematic inspection of the entire airframe, powerplant and accessories. Fundamentals of rigging flight controls and operation of rotary wing aircraft are introduced.

32-402-331 Aircraft Powerplant 2 (4 cr.)
Emphasizes the theory, repair and troubleshooting of aircraft turbine engines. Hot section inspection, ground servicing, engine run-up, inspection procedures, use of various test equipment and engine instruments are covered. Regulations and use of manufacturers' manuals are stressed.

32-402-337 Powerplant Systems 3 (3 cr.)
Examines such topics as aircraft carburetion, float, injection and turbine fuel metering, as well as the maintenance and overhaul of associated fuel system components. Appropriate FAR's and manufacturers' procedures are followed.

32-402-339 Propellers (2 cr.)
Explains the construction and operating principles of propellers and propeller systems. Federal Aviation Administration regulations and manufacturers' specifications relating to the installation, inspection and maintenance of propellers and their systems are addressed.
**Course Descriptions**

### 403 Architectural Drafting

**31-403-300 Building Trades Print Reading (1 cr.)**
Introduces the skills required for individuals to read and interpret various types of drawings. Focusing on construction prints, drawings and symbols, students will learn the types of information they can find on site plans, floor plans and detail drawings. Learners will be introduced to the skills needed to read and interpret residential and commercial construction blueprints.

### 405 Auto Body-Chassis & Finish

**10-405-119 Industry Trends Vehicle Repair (1 cr.)**
Familiarizes students with the auto collision repair industry. Students complete written and oral reports based on information obtained from trade publications, manuals and technical newsletters.

**10-405-120 Collision Repair Mech - HVAC (2 cr.)**
Provides the learner with the knowledge to locate, identify, inspect, test, and repair or replace both heating and cooling system components. Students also diagnose both heating and cooling systems for leaks, belt and pulley alignment, and safely identify, label, store, evacuate, recharge, replace, and recycle coolants and refrigerants in accordance with EPA regulations.

**10-405-122 Collision-Drive Systems (2 cr.)**
Provides the learner with the knowledge to locate, identify, inspect, diagnose, and repair or replace collision damaged brake system, drive train, fuel, and emission system components.

**10-405-124 Internship-Vehicle Repair (1 cr.)**
Provides students with work experience on vehicles in area shops. This internship is available between the first and second year of the program.

**10-405-128 Collision Repair Electric Sys-SRS (1 cr.)**
Explains that today's vehicles use multiple safety features to provide occupant protection during a collision. This course introduces learners to restraint and supplemental restraint systems operation, troubleshooting, diagnosis, and repair.

**10-405-144 Collision Repair Welding 1 (2 cr.)**
Provides instruction in welding safety; introduction to the GMAW (MIG) welding process and equipment; and skills training in GMAW (MIG) welding on light gauge automotive steels in the flat, vertical and overhead positions. Students apply safe welding standards to a variety of industry applications on metals in a lab setting.

**10-405-146 Collision Repair Welding 2 (2 cr.)**
Provides instruction and skills training in oxy acetylene and plasma arc cutting, GMAW (MIG) welding on structural grade automotive steels in the flat, vertical and overhead positions. Students apply safe welding standards to a variety of industrial applications on metals in a lab setting. Squeeze type resistance spot welding (STRSW), welding aluminum and silicone bronze is also introduced to students in this course.

**10-405-180 Intro to Collision Repair (2 cr.)**
Focuses on developing the skills in professionalism, safety, and the use of basic hand and power tools and equipment in accordance with industry-accepted standards. Students are introduced to collision repair industry terms and definitions, as well as identifying and using collision repair information and procedures.

**10-405-181 Intro to Automotive Refinishing (2 cr.)**
Provides the learner with safety considerations and environmental regulations and how they apply to surface coating application. Emphasis is on personal protection, types of equipment operation and maintenance, and spray gun set-up and transfer efficiencies. Learners are also introduced to buffing and polishing in this course.

**10-405-182 Collision Repair Non Struct 1 (2 cr.)**
Provides the learner the opportunity to develop the skills, knowledge and process of removal, replacement and storage of interior and exterior trim, disarming/arming restraint systems and adjustment to moveable glass, lamps bumpers and moveable tops.

**10-405-183 Collision Repair Non Struct 2 (2 cr.)**
Provides the learner the opportunity to develop the skills required to identify different types of vehicle construction, develop a repair plan, align bolted and moveable exterior panels while utilizing appropriate tools.

**10-405-184 Collision Repair Non Struct 3 (2 cr.)**
Provides the learner the opportunity to develop the skills and knowledge of sheet metal characteristics, repair sequences, and the processes for straightening while maintaining corrosion.

**10-405-185 Collision Repair Non Struct 4 (2 cr.)**
Provides the learner the opportunity to develop the skills and knowledge to utilize a damage report for the removal and application of sealers, undercoats, corrosion protection and various types of foams. Additionally, students will determine repair/replace choices, perform panel bonding and welding, and perform aluminum panel repair procedures.
10-405-186 Plastics and Composites (1 cr.)
Explains that the use of plastics is commonplace on vehicle construction. Plastics are commonly damaged during a collision, and repairs to the plastic may be required. This course provides the learner with the knowledge, processes, and skills required to identify the type of plastic, the possible repair options, the repair techniques, and the refinishing options and techniques for various types of plastics.

10-405-187 Collision Refinishing Surface Preparation (2 cr.)
Teaches students to prepare surfaces to be refinished by utilizing cleaning, sanding, and masking techniques, while protecting non-refinish areas of the vehicle from overspray and component damage. Learners also develop existing finish defect and substrate assessment along with primer product choices.

10-405-188 Refinish and Topcoat Application (3 cr.)
Covers locating and mixing automotive color formulas and procedures for applying automotive finishes, including spray gun operation and technique. Blending is also introduced in this course.

10-405-189 Refinishing, Tinting, & Blending (2 cr.)
Covers procedures for applying automotive finishes, including advanced spray gun setup considerations and techniques and blending additives. Also included is an in-depth study and application of color movement, along with color assessment tools.

10-405-190 Collision Refinishing-Advanced (3 cr.)
Covers the application and blending of automotive multi-stage finishes, the use of waterborne refinishing materials, and improving efficiency during the refinishing process. Refinishing defect identification, diagnosis and repair is also covered, with emphasis on learning how to avoid defects while refinishing. Preparing a vehicle for customer pickup, including proper vehicle detailing, interior cleaning, engine compartment cleaning, exterior cleaning, polishing, and application of decals, stripes, and graphics, is also covered.

10-405-191 Collision Repair Structural 1 (3 cr.)
Provides the learner the opportunity to develop the skills and knowledge to perform inspections of automotive structural components and determine the extent of damage.

10-405-192 Collision Repair Structural 2 (3 cr.)
Provides the learner the opportunity to develop the skills and knowledge to utilize anchoring and pulling equipment for straightening, realigning, replacing and sectioning unibody structural components, sections and other vehicle outer panels. Additionally, students will utilize power and hand tools for cutting, welding, stress relieving and replacing corrosion protection.

10-405-193 Collision Repair Structural 3 (2 cr.)
Provides the learner the opportunity to develop the skills and knowledge to utilize anchoring and pulling equipment for straightening, realigning, replacing and sectioning frame structural components. Additionally, students will utilize power and hand tools for cutting, welding, stress relieving, replacing fixed glass and corrosion protection.

10-405-194 Collision Repair Estimating (1 cr.)
Provides the opportunity for the learner to develop skills in auto body construction, model identification, damage analysis, parts sources, handwritten damage reports and computerized damage reports and shop management.

10-405-195 Collision Repair Customer Relations (1 cr.)
Focuses on developing skills in professionalism, customer relations and service, and provides an overview of what collision repair businesses and insurance companies will expect from their employees in regards to customer retention. Students are introduced to phone answering skills, interpersonal communication skills, and preparing and presenting damage reports to the customer. Topics also covered include parts ordering and vehicle scheduling, dealing with customer complaints and problem-solving.

409 Cabinetmaking & Millwork

31-409-315 Sketching & Drafting-Manufacturing (2 cr.)
Introduces students to the fundamentals of drafting and requires them to make simple sketches and drawings of wood products, using accepted drafting principles and conventions. The main focus is on learning and using AutoCAD. Drafting assignments are keyed to the manufacturing of wood products—cabinets, furniture and millwork.

31-409-335 Blueprint Reading & Estimating-Manufacturing (2 cr.)
Combines blueprint reading with planning and production estimating. Students take information from the plans and specifications provided by industry and use to prepare material and parts lists. These are used to create material and labor cost estimates. Computer-based estimating is introduced, using Product Planner from Pattern Systems.
31-409-352 Tool & Machine Maintenance-Manufacturing (1 cr.)
Covers the care and maintenance of tools, machines and equipment used for wood product manufacturing. Students sharpen chisels, plane irons, drill bits, saws and other tooling, change knives in a jointer, and do routine maintenance on portable and stationary machines. A major emphasis is on creation of original tooling (moulder knives) through making a precision template to be used on the Weinig profile knife grinder.

31-409-353 Woodworking Machinery & Proc. Prin. 1 (WMT) (3 cr.)
Introduces the learner to the basic elements woodworking material, tools, machinery and processes. A variety of curriculum delivery methods will be utilized to assist the learner in comprehending the various types of material, terminology, hand tools, portable and stationary power tools, and processes used in the woodworking industry.

31-409-354 Woodworking Machinery & Proc. Appl. 1 (WMT) (4 cr.)
Learners are challenged to satisfactorily complete a series of exercises to demonstrate psychomotor competency in the proper and safe use of machinery and equipment. The learner is guided to develop the habits required to safely and efficiently perform machining tasks to specified tolerance within a limited timeframe. The learner will demonstrate proficiency in basic woodworking processes by demonstrating an understanding of the material, machinery and additional products used in the industry to manufacture goods. A specific capstone project is completed and self-assessed to complete the course.

31-409-355 Woodworking Machinery & Proc. Prin. 2 (WMT) (3 cr.)
Learners are introduced to an advanced level of machine setup and operation. This unit includes the introduction to shaper work, production sawing and molding, joinery techniques, and jig and fixture design. The learner works with a small group to develop teamwork skills.

31-409-356 Woodworking Machinery & Proc. Appl. 2 (WMT) (4 cr.)
Learners are challenged to satisfactorily complete a series of machine setup and operation exercises to demonstrate psychomotor and cognitive competency of the process. The learners will work in a team setting to communicate ideas and responses about the setup and operation of advanced industrial equipment and processes. A series of exercises are incorporated into this course to demonstrate capability with each process.

31-409-357 Cabinetmaking Principles (WMT) (3 cr.)
Focuses on the planning and design of face-frame style cabinetry. Emphasis is on developing the knowledge needed to create a cabinet layout that meets the specific needs of the customer as well as determine the material and processes needed to complete the cabinetry. Units in this course include cabinet design, door and drawer design, jig and fixture design, and countertop design. The learner will be introduced to hardware, sheet goods and a variety of countertop materials. A portion of the course is devoted to frameless cabinetry material and processes.

31-409-358 Cabinetmaking Application (WMT) (4 cr.)
Learners are challenged to develop jigs and fixtures to create drawers and doors used in face-frame style cabinetry as well as demonstrate the ability safely and efficiently to manufacture parts to specified dimensions within a limited tolerance. Learners will build upon the skills gained in prior courses to select material, manufacture parts, and assemble components to create a set of cabinets to a specific dimension. Learners will set up and use machinery specific to sheet good processing. They will be exposed to and develop the skills necessary to create countertops out of high-pressure laminate as well as solid surface material to specification. Learners will self-assess completed cabinetry and countertop exercises to complete the course.

31-409-359 Millwork & Furniture Principles 1 (WMT) (3 cr.)
Includes the principles of veneering, advanced machine joinery and computer numerically controlled routing. Learners are required to choose and develop three process explorations. A process exploration is an exercise where the learner takes a specific process and explores that process in as many avenues and variations as possible.

31-409-360 Millwork & Furniture Application 1 (WMT) (4 cr.)
Learners are challenged to safely and efficiently complete a series of veneered good exercises, create several examples of machine made joints, write a series of machine language exercises to operate a CNC router and develop three process explorations. Learners will work on state-of-the-art machinery to complete a series of exercises as well as work with the instructional staff to create exercises and learning activities needed to explore three advanced woodworking process. Learners will self-assess the process exploration process as well as the finished product.
31-409-361 Millwork & Furniture Principles 2 (WMT) (3 cr.)
Learners will continue to build upon the knowledge gained in all previous courses to develop the design and processes necessary to create a free-standing furniture project. All planning and material designation and procurement for the project are completed during the first several weeks of this course. Learners are required to make multiples of this furniture to demonstrate the understanding of the manufacturing processes used in the industry.

31-409-362 Millwork & Furniture Application 2 (WMT) (4 cr.)
Learners will demonstrate competence in the psychomotor and metacognitive aspects of woodworking by applying and extrapolating knowledge learned to create multiple copies of a free-standing piece of furniture. Safe and efficient use of equipment, material and processes will be demonstrated by the learner while creating the furniture to specifications developed by the learner. The furniture is the capstone project for this course and is self-assessed by the learner.

410 Wood Technics - Manufacturing (Carpentry)

31-410-315 Introduction to AutoCAD-Construction (2 cr.)
Introduces the student to basic AutoCAD commands and techniques. Instruction during the first half of the course focuses on basic drawing and editing commands. During the second half of the course, students will use AutoCAD software to prepare, dimension, annotate and plot various residential construction drawings and details.

31-410-335 Blueprint Reading & Estimating-Construction (2 cr.)
Combines a study of residential blueprint reading and residential construction estimating. Students learn to estimate the labor and material necessary to construct a house by examining all plans, elevations and details that are commonly found in residential drawings. Students will practice both manual and computer-based estimating techniques as they work with spreadsheets and published data for estimating residential construction costs.

31-410-353 Exterior Finish Principles (RBC) (4 cr.)
Introduces the tools, materials and methods to complete the exterior covering and finish of a house. Topics include roof coverings, mechanical flashing, fascia and soffit systems, windows and door installation, siding and exterior detailing. Students must demonstrate proficiency with related tools and satisfactorily complete lab exercises before engaging in project activity.

31-410-354 Exterior Finish Project (RBC) (3 cr.)
Challenges students to complete the exterior of a house or other projects on a construction site. Students will install roofing, aluminum soffit systems, windows and manufacturing siding. Emphasis is on flashing details which maintain the integrity of a building’s drainage plane and fastening details which provide for differential movement of modern manufactured materials.

31-410-355 Interior Closure Principles (RBC) (4 cr.)
Focuses on the principles of temperature control, moisture control and interior wall finish. Topics of study include insulation materials, ventilation methods, building wraps, vapor barriers, sheetrock installation, drywall finish and drywall repair. Students learn about current building science for avoiding common building problems such as condensation, mold and ice dams.

31-410-356 Interior Closure Project (RBC) (3 cr.)
Offers the opportunity to complete the insulation, vapor barrier and drywall of the on-site student project. Students use principles learned in lab and classroom activities to select, cut, fasten, install and finish interior materials according to accepted trade standards.

31-410-357 Interior Finish Principles, Basic (RBC) (4 cr.)
An overview of the residential millwork industry. Students gain knowledge of millwork manufacturing, product distribution and profile recognition in classroom assignments. Lab activities include demonstration and extensive practice installation of jambs, doors and casing. Emphasis in on developing superior carpentry skills in a lab setting prior to completion of the student project.

31-410-358 Interior Finish Project, Basic (RBC) (3 cr.)
Develops interior finish competence as students work independently to complete individual tasks at the site. Students receive hands-on experience installing underlayment, window extension jambs, door jambs, interior doors and casing in the student project.

31-410-359 Interior Finish Principles, Intermediate (RBC) (4 cr.)
Continues the study of interior trim materials undertaken in Interior Finish Principles, Basic. In the classroom, students learn about stair parts, interpret cabinet drawings, evaluate countertop materials and study the basics of hardwood flooring installation. In the lab, students receive a demonstration of hardwood flooring installation and develop skill installing base and crown moulding.
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31-410-360 Interior Finish Project, Intermediate (RBC) (3 cr.)
Further develops finish carpentry skills and production efficiency through installation of moulding, cabinets and countertop material in completion of the student construction project. Students are shown how to recognize, evaluate and resolve common millwork installation problems arising at the construction project.

31-410-361 Frame Construction Principles (RBC) (4 cr.)
Examines the theory and practice of residential framing techniques. Topics include light-frame construction of floors, walls and roofs. Proper use of dimensional lumber, engineered lumber and panel sheathing is stressed. The Uniform Dwelling Code and manufacturers' literature is used to size load-carrying members and comply with applicable codes. In the lab, students practice laying out floors, stairs and walls. Students learn to use a framing square to calculate and lay out common types of rafters in completion of a roof mock-up.

31-410-362 Frame Construction Project (RBC) (3 cr.)
Provides students with on-site framing experience. Working in groups of 3-4 students, members plan, lay out and frame assigned sections of the floor, wall and roof systems of a house. Safe work practices, thorough planning and attention to detail are stressed in all phases of frame construction.

31-410-363 Residential Building Codes and Regulations (RBC) (1 cr.)
Explores codes, regulations and specifications governing construction of residential buildings. Students learn to locate and interpret technical information available in the Wisconsin Uniform Dwelling Code, county zoning regulations, local covenants and product literature. Following classroom review and discussion, students will be evaluated on their ability to comply with rules and regulations during actual building construction.

412 Combustion Engines

10-412-117 Diesel Hydraulic/Pneumatic Systems (2 cr.)
Focuses on the basic hydraulic fundamentals and circuits found on heavy-duty trucks, tractors and heavy equipment. Includes hands-on testing, troubleshooting and repair of power steering circuits, pumps, cylinders and control valves. Basic air systems and controls are covered.

10-412-118 Drive Train (4 cr.)
Focuses on the operation and maintenance of the power train. Students will learn the procedures for overhauling, adjusting and troubleshooting heavy-duty transmission, clutches and various final drives found on over-the-road trucks and tractors. Students will learn how to calculate the change driveline angles.

10-412-119 Brake Systems-Diesel (4 cr.)
Focuses on the air brake system component operation and maintenance for trucks and tractor/trailers. Students will learn to perform overhaul procedures for cam; wedge and disc air operated foundation brakes as well as heavy-duty hydraulic brakes. Provides the opportunity to test and troubleshoot the entire air and hydraulic brake systems, including the ABS systems found in trucks.

10-412-121 Suspension and Steering (4 cr.)
Focuses on heavy-duty truck suspensions and steering systems. Students will learn about the operation, maintenance and overhaul of various types of heavy-duty suspensions. Provides technicians with the opportunity to perform total vehicle alignments. Testing and troubleshooting of power steering systems and steering complaints are also covered.

10-412-122 Electrical 1 (4 cr.)
Focuses on the fundamentals of electricity, batteries, starting circuits, charging circuits and electrical circuits found on trucks and tractors. Students will learn testing and troubleshooting procedures for various systems presently used in the industry, as well as how to perform repairs.

10-412-124 Heating, Ventilation & Air Conditioning (4 cr.)
Provides students with information and skills required to service commercial vehicle heating, ventilation, and air conditioning systems. Students practice proper procedures for handling R12/R134A Freon and for Servicing HFC 134A systems. Students will receive Wisconsin AG-136 certification.

10-412-125 Engine Rebuilding (5 cr.)
Students disassemble, identify each part, measure all wear points, and make reuse recommendations, analyze failed components and reassemble two electronic controlled diesel engines. Component analysis, function and operation theories of the diesel engine are lecture topics studied.
10-412-126 Diesel Fuel Systems (4 cr.)
Focuses on electronic computer controlled engine management system function, component identification and computer based troubleshooting tool operation. Lab demonstrations cover component identification, function and testing of the fuel subsystem, along with the removal, inspection, adjustment and testing of fuel injection pumps, nozzles and injectors.

10-412-127 Tune-up & Diagnostic Testing (4 cr.)
Focuses on key troubleshooting skills and methodology. Engine system testing procedures and tools are used to analyze symptom-based engine problems. Application of computer diagnostic tools is employed in actual live road testing situations. Engine dynamometer operation will also be part of this course.

10-412-128 Service Management (4 cr.)
Focuses on business operations, shop liability and human relations issues in the diesel mechanics field. Students will be introduced to regulations for federal and state agencies such as OSHA, DILHR, DOT and the DNR.

10-412-130 Electrical Power Generation 1 (4 cr.)
Focuses on understanding the operation and maintenance required for electrical power generation equipment. It provides in-depth study and hands-on activities, including maintaining, troubleshooting, and repairing generator sets. Participants will learn how to test for proper operation and make appropriate adjustments. Topics include control panels, circuit breakers and voltage regulators.

10-412-131 Introduction to Light Duty Diesel Engines (2 cr.)
Introduces students to diesel engine operation fundamentals. Air intake, exhaust, fuel systems and emission standards will be covered. Covers maintenance, tune-ups, including fuel pump and injector replacement. Students will learn to troubleshoot drivability and fuel economy complaints.

413 Electricity

31-413-310 Electrical Careers Preparation (2 cr.)
Orients the new student to Electrical Careers. Learners explore the many facets of starting an electrical career, employment trends and job opportunities. Students are introduced to computer systems and their role in the electrical workplace. Students detail occupational descriptions, examine electrical apprenticeship and begin development of a professional growth plan.

31-413-311 Electrical Safety, Construction (1 cr.)
Describes hazards of electrical work and basic approaches to working safely. Students learn skills to recognize, evaluate and control electrical hazards. Includes personal protective equipment and how to perform construction tasks safely. Introduces OSHA-mandated Lockout/Tagout procedures and prepares learners for additional detailed safety training. Upon successful completion, the student will receive a Department of Labor OSHA Construction Safety and Health 10-hour completion card.

31-413-312 Tools and Test Equipment (1 cr.)
Focuses on the proper selection, inspection, use and maintenance of common hand tools, power tools and test equipment used by the electrical trades. Students will practice using many of the instruments while learning appropriate use procedures, maintenance instructions and safety rules.

31-413-313 Electrical Principles 1 (3 cr.)
Introduces basic electrical theory and concepts used with direct current (DC) circuits with a practical approach to construction and maintenance applications. Topics include atomic and electron theory, voltage, current, resistance, power, Ohm’s law, Kirchhoff’s law, series, parallel, and series-parallel circuits. Students reinforce theory and concepts by performing hands-on lab activities.

31-413-315 National Electrical Code 1 (1 cr.)
Introduces uses and application of state and national electrical codes. Examines definitions, enforcement issues and the code-making cycle, and how occupancies affect the electrical installation process. Students practice finding information using an easy-to-follow procedure and become familiar with the types of information found within the code book.

31-413-317 Electric System Troubleshooting (1 cr.)
Discusses the methods of troubleshooting residential, commercial and industrial electrical problems. General principles and examples are presented, along with safety considerations. Step-by-step applications show how to troubleshoot electrical systems.

31-413-318 Electrical Print Reading (1 cr.)
Introduces the skills required for individuals to read and interpret various types of electrical drawings. Students will learn the types of information they can find on schematics, one-lines, and wiring diagrams. Learners are introduced to the skills needed to read and interpret residential and commercial construction blueprints.
31-413-320 Tools for Success (2 cr.)
Specifically for people choosing a career in Electrical Construction or Maintenance. Focuses on workplace productivity, teamwork, conflict management, communications, and critical thinking. Learners apply examples drawn from construction-related documents such as OSHA regulations, training manuals, materials lists, specification, blueprints and construction-related settings, with situations encountered on a typical job site.

31-413-321 Electrical Principles 2 (3 cr.)
Explores characteristics of alternating-current systems and application of Ohm’s Law to AC circuits. Topics include sine wave, inductance, capacitance, reactance, impedance, power factor, and transformers. Learners analyze series, parallel, and combination circuits, and reinforce the theory and concepts about AC circuits by performing a succession of hands-on lab activities.

31-413-322 National Electrical Code 2 (1 cr.)
Continues the examination of uses and applications of the state and national electrical code as they pertain to electrical installations. Learners will focus on the general requirements of electrical installations, conductor types and use, general wiring methods and techniques as they relate to residential, commercial and industrial applications.

31-413-323 Control Devices (2 cr.)
Familiarizes the learner with diagrams and devices used to control motors. Circuit logic is examined with the role relays, timers, and sensors are used in applications. Through hands-on wiring lab activities, learners will become familiar with control circuits. Learners will use personal computers and software to construct electrical motor control diagrams.

31-413-324 Electric Motor Installation (2 cr.)
Introduces principles of DC and AC motor operation. Single-phase and three-phase AC motors are emphasized such as split-phase, capacitor, shaded pole, squirrel cage induction, wound rotor, and universal motors. Students practice making proper motor connections. The National Electrical Code requirements for motor installations are also covered.

31-413-325 National Electrical Code 3 (1 cr.)
Continues the examination of uses and applications of state and national electrical code as they pertain to electrical installations. Learners will focus on the requirements of services, calculations, motors, transformers and special locations as they relate to residential, commercial and industrial applications.

31-413-326 Electrical Wiring Methods (3 cr.)
Develops the basic skills needed for planning and installing electrical equipment. This course covers the electrical devices and wiring techniques that are common to residential, commercial and industrial applications through the use of typical construction plans, specifications layout and design. The appropriate safety and code requirements are stressed. In addition to classroom and lab work, students complete the trim-out stage of a residential building wiring project.

31-413-327 Equipment Installation (3 cr.)
Introduces conduit bending and installation using hand-operated and step conduit benders. Learners are introduced to the types and applications of raceways, wireways, hardware and support systems used to mount boxes, receptacles and other electrical equipment. Installation safety and NEC requirements are stressed. In addition to classroom and lab work, students complete the rough-in stage of a residential building project.

31-413-328 NEC for Low-Voltage Systems (1 cr.)
Explores the current National Electrical code rules that apply to low-voltage and limited energy systems. Definitions, the general NEC installation requirements, and specific NEC requirements for control, sound, video, CATV, CCTV, antennas, telephone, fiber optics etc. are covered. Additional topics include grounding, cable installation, spacing and support.

31-413-329 NEC Requirements for Solar PV Systems (1 cr.)
Explores solar power basics and the NEC requirements that govern solar installations. Students will gain an understanding of solar photovoltaic electrical energy systems and how they relate to other electrical power production sources. All topics are covered in relation to the current edition of the National Electrical Code.

31-413-330 Electrical/Construction/Mfg Careers (1 cr.)
Explores the trades that exist, the type of work that is done, and the various career paths that await while assessing the qualities of a good candidate for the electrical, manufacturing and construction industry. Students are introduced to personal computers and their role in the workplace. The learner will also explore the many facets of starting a career in electricity, manufacturing or construction, employment trends, and what different job opportunities exist.
419 Industrial Hydraulics-Pneumatics

10-419-101 Fluid Power - Mechanical Design (2 cr.)
Examines the fundamentals of fluid power transmission and how they are applied to the hydraulic, pneumatic and electronic components that make up the operating systems of many machines. Each component is studied regarding its working principles, function and placement in the system.

10-419-103 Fluid Power (3 cr.)
Covers hydraulic and pneumatic control circuits. Basic hydraulics, hydraulic activators, accumulators, values, pumps, motors, fluids and filters will be studied. Students also will learn about basic pneumatic principles, air compression, work devices, control devices and circuit diagrams. Closed loop proportional control is introduced in theory and lab.

420 Machine Tool Technology

10-420-111 Metallurgy (2 cr.)
Introduces ferrous and nonferrous metals. The properties and behaviors of these metals are considered in regard to their application. Participants test the microscopic structure of the metals with respect to their properties. Common heat-treating methods are used to change the properties of the metal.

10-420-145 Manufacturing Processes, Cold-Machining (2 cr.)
Covers the basic machining processes used to cut, form and shape materials to desired forms, dimensions and surface finishes. This course examines metal-cutting machines, cutting tools and workholding devices including jigs and fixtures. Metal stamping and forming processes are also reviewed.

32-420-314 Manufacturing Techniques, Cold (1 cr.)
Focuses on the manufacturing processes not necessarily done in a machine shop and covers techniques performed on materials in a cold state. Topics include cold-working metals, metal stamping and forming in presses, recent techniques in metalworking, and polishing and finishing of metal surfaces.

32-420-315 Manufacturing Techniques, Hot (1 cr.)
Provides the student with basic knowledge and experiences in welding, foundry and forging processes. Other areas studied are hot metal extrusion, hot metal forming and steel making. The student will receive hands-on experience in welding, with project assignments closely related to the machining portion of the program.

32-420-331 Measurement & Benchwork 1 (3 cr.)
Builds a foundation for subsequent training in machining, industrial maintenance or other industrial areas requiring correct and accurate use of hand tools and precision measuring instruments in a safe manner. Prepares students for entry-level machine operator or maintenance machinist position in an industrial plant.

32-420-332 Measurement & Benchwork 2 (3 cr.)
Continues to build a foundation for subsequent training in machining, industrial maintenance or other industrial areas requiring correct and accurate use of hand tools and precision measuring instruments in a safe manner. Prepares students for entry-level machine operator or maintenance machinist positions in an industrial plant.

32-420-333 Engine Lathe 1 (3 cr.)
Introduces aspiring machinists or maintenance mechanics to the basic operations and safety practices associated with the engine lathe. Prepares students for entry-level machine operator or maintenance machinist positions in an industrial plant.

32-420-334 Engine Lathe 2 (3 cr.)
Continues to introduce aspiring machinists or maintenance mechanics to the basic operations and safety practices associated with the engine lathe. Prepares students for entry-level machine operator or maintenance machinist positions in an industrial plant.

32-420-335 Manual Milling Machines 1 (3 cr.)
Introduces aspiring machinists or maintenance mechanics to the basic operations and safety practices associated with the manual milling machine. Prepares students for entry-level machine operator or maintenance machinist positions in an industrial plant.

32-420-336 Manual Milling Machines 2 (3 cr.)
Continues to introduce aspiring machinists or maintenance mechanics to the basic operations and safety practices associated with the manual milling machine. Prepares students for entry-level machine operator or maintenance machinist positions in an industrial plant.

Introduces aspiring machinist or maintenance mechanics to advanced manual machining practices. Prepares students for entry-level machine operator or maintenance machinist positions in an industrial plant.
Course Descriptions

Continues to introduce aspiring machinists or maintenance mechanics to advanced manual machining practices. Prepares students for entry-level machine operator or maintenance machinist positions in an industrial plant.

32-420-339 Grinding Processes 1 (3 cr.)
Introduces aspiring machinists or maintenance mechanics to precision grinding machines. Prepares students for entry-level machine operator or maintenance machinist positions in an industrial plant.

32-420-340 Grinding Processes 2 (3 cr.)
Continues to introduce aspiring machinists or maintenance mechanics to precision grinding machines. Prepares students for entry-level machine operator or maintenance machinist positions in an industrial plant.

32-420-341 CNC M/G Code 1 (3 cr.)
Upgrades the skills of established machinists. Prepares students to become a higher level machine operator or machinist in an industrial plant.

32-420-342 CNC M/G Code 2 (3 cr.)
Continues to upgrade the skills of established machinists. Prepares students to become a higher level machine operator or machinist in an industrial plant.

32-420-343 CNC, Advanced 1 (3 cr.)
Upgrades the skills of established machinists. Prepares students to become a higher level machine operator or machinist in an industrial plant.

32-420-344 CNC, Advanced 2 (3 cr.)
Continues to upgrade the skills of established machinists. Prepares students to become a higher level machine operator or machinist in an industrial plant.

32-420-345 CAM Programming & Toolmaking 1 (3 cr.)
Covers the basics of MasterCAM Mill and Lathe with the emphasis on producing Tool path. Tool making design and economics is also emphasized in this course.

32-420-346 CAM Programming & Toolmaking 2 (3 cr.)
Continues to cover the basics of MasterCAM Mill and Lathe with the emphasis on producing Tool path. Tool making design and economics is also emphasized in this course.

421 Mechanical Drafting

32-421-313 Drafting, Basic Mechanical, Machine Tool (2 cr.)
Includes the fundamentals of drafting through the use of sketches on gridded paper. In addition, the student will also be introduced to commands and CAD/CAM techniques using Mastercam. Mastercam is a CAD/CAM system that is used in industry.

32-421-324 Blueprint Reading, Machine Tool Program (2 cr.)
Focuses on the interpretation of machine drawings. Students study isometric and orthographic views on drawing and develop simple working drawings. Topics include dimensions, internal and external threads, holes, bores, fillets, radii, surfaces, planes, metric and geometric dimensioning and tolerancing.

422 Metallurgy

32-422-310 Metallurgy, Machine Tool/Iron/Steel Alloys (1 cr.)
Introduces the science of metals and alloys. The crystalline structure and microstructure of metals and their effect on the properties of metals are studied. Prime consideration is given to heat treatment operations dealing with ferrous metals.

423 Millwright

31-423-302 Construction Related Equipment (3 cr.)
Focuses on the proper selection, use and maintenance of common hand tools, power tools and equipment used by the construction trades and scaffold erecting. Also covered are the hardware and support systems used in the construction trade. The student will learn the various types of anchors and supports, their applications and how to install them safely. Rigging and lifting techniques are practiced using chains and lever hoists. Safety issues concerning power rigging, using cranes and special lifting equipment are emphasized. Students will practice hands-on exercises while learning appropriate use procedures, maintenance instructions and safety rules. Students will recognize and apply common shapes and measurements used in the construction trades, to include area, angles, volume, reading measurements, metric system and linear measure.
442 Welding

10-442-105 Welding, Applied-Diesel (3 cr.)
Acquaints students with the common welding techniques and procedures for arc and oxyacetylene welding in all positions. Topics include fusion welding, brazing, cutting, metal identification, selection of electrodes and American Welding Society symbols. Students will also develop skills in working with other people.

30-442-332 SMAW Production (1 cr.)
A continuation of SMAW Techniques 1. The primary emphasis will be in the use of E6010, E7018 and E8018 electrodes within the parameters set forth in the various welding codes. The students will enhance skills to standards set forth in AWS, ASME and steel building codes. The testing will incorporate 3G and 4G positions with both carbon steels and stainless steels.

30-442-333 GTAW Production (1 cr.)
A continuation of GTAW Techniques. The primary emphasis will be in the use of the various tungsten electrodes being used in industry. The main focus is skill enhancement to standards set forth in AWS, ASME and API codes. The student will be tested in the 3G and 4G plate positions in steel applications, with the greatest emphasis being in the 5G and 6G positions using thin wall stainless steel pipe and tubing and aluminum plate less than 0.315 inches thick.

31-442-315 Welding, Applied Arc-TIG-MIG-Practice (2 cr.)
Acquaints students with the common welding techniques and procedures for arc and oxyacetylene welding in all positions. Topics include fusion welding, brazing, cutting, metal identification, selection of electrodes and American Welding Society symbols. Students also develop skills needed for working with other people.

443 Building Service

31-443-301 Insulation and Air Sealing Methods (2 cr.)
Provides an overview of weatherizing and energy conservation. Students will be introduced to insulation, ventilation, caulking, weather-stripping and thermography. Students will have the opportunity for classroom discussion and hands-on lab activities.

31-443-302 Carpentry and Restoration (2 cr.)
Provides an overview of the carpentry trade. Students will be introduced to roofing, siding, masonry, windows and doors, drywall and decks. Students will have the opportunity for classroom discussion and hands-on lab activities.

31-443-303 Pipefitting/Plumbing Systems Overview (2 cr.)
Provides an overview of the plumbing trade. Students will be introduced to working with pipe, sinks and faucets, repairs, toilets, tubs and showers, water heaters, sump pumps and wells. Students will have the opportunity for classroom discussion and hands-on lab activities.

31-443-304 Basic Electrical Repair and Servicing (2 cr.)
Provides an overview of the electrical trade. Students will be introduced to basic wiring systems, safety measures, circuit breaker and fuses, receptacles, switches, GFCI's, phone wiring and lighting fixtures. Students will have the opportunity for classroom discussion and hands-on lab activities.

31-443-305 HVAC Principles (2 cr.)
Provides an overview of the heat and cooling trade. Students will be introduced to basic systems, space heaters, stoves & fireplaces, humidifying, A/C, air quality, and thermostats. Students will have the opportunity for classroom discussion and hands-on lab activities.

31-443-306 Specialized Building Equipment (2 cr.)
Provides an overview of the specialized equipment such as sump pumps, door openers, garbage disposals and dishwashers. Students will be introduced to manuals, appliance repair and installation. Students will have the opportunity for classroom discussion and hands-on lab activities.
449 Industrial Safety

10-449-101 Safety Management (3 cr.)
Provides an introduction to occupational health and safety management principles. Topics include a history into safety and health management, ethics, interpersonal dynamics, prevention, response, and promoting safety in the workplace. This course reviews the role a safety and health coordinator has in today's workplace. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-102 Regulatory Compliance (3 cr.)
Provides the student with an introduction of the federal and state standards that apply to safety and health. The focus will be on how to research and respond to regulatory standards. Using on-line and off-line resources, the student will respond to a series of selected questions about regulatory compliance. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-103 Accident Investigation (3 cr.)
Reviews the practices needed to conduct an effective and thorough accident investigation and prepare a comprehensive accident report. The student will learn to interview witnesses, prepare a site drawing, and gather appropriate visual evidence. In a simulated scenario, the student will prepare a comprehensive report on the incident. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-104 Industrial Hygiene, Introduction to (2 cr.)
Focuses on identifying and preventing environmental stressors in the workplace. The student will be involved in predicting, recognizing and assessing exposures that can lead to sickness or injury within the facility. Students will locate and interpret the OSHA 300 logs and compare to current injury/illness data. The student will develop the appropriate written plans to respond to the identified potential exposure. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-105 Audits and Inspections (2 cr.)
Examines the process that takes place during the planning, design, and implementation of an effective audit and inspection program. The student will learn how to conduct the monitoring function in an organization to locate and report existing and potential hazards. Additionally, the student will develop site specific inspection forms in selected topic areas. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-107 Safety Research and Survey (1 cr.)
Examines all aspects of a safety and health program for a specific industry. Students will develop comprehensive recommendations regarding safety and health for a specific industry. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-108 DOT Rules & Regulations (1 cr.)
Designed to provide an overview of the DOT regulations. The course topics include how to prepare for DOT reviews, Federal Motor Carrier Safety Regulations compliance, Safety Performance History requirements and Hazardous Materials requirements. The students will develop a Transportation Security Act plan for a selected facility. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-110DE Principles of Safety Security (2 cr.)
Explains the supervisor's role in developing and implementing safety procedures and accident prevention programs in all types of work environments. Other topics include ergonomics, office safety, health care cost and Occupational Safety and Health Administration (OSHA) standards. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-111DE Specialized Building Protective Systems (3 cr.)
Explains the role that building protective systems have in Life Safety issues. Students will develop and implement building safety procedures for all types of work environments. Other topics include sprinkler systems, dry powder systems, and the Occupational Safety and Health Administration (OSHA) Standards. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-113 Wind Technician Health and Safety (2 cr.)
Familiarizes students with the Federal Safety and Health Regulations (OSHA) related to the wind power generation industry. It introduces the student to proper methods and procedures to eliminate and control hazards related to potential injury/illness in the industry. Students will receive training in first aid, CPR, rigging, and confined space and will receive a 30-hour OSHA for General Industry certification upon completion of the course.
10-449-114 OSHA & Health Care (3 cr.)
Explains the relationship of OSHA to the health care industry. Other topics include ergonomics, hazardous chemicals, electrical, and Occupational Safety and Health Administration (OSHA) standards. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-115 Business Continuity Planning (3 cr.)
Provides the student with the working knowledge of continuity planning. The student will discuss the aspects of preparing a facility for a catastrophic building failure. These include the process of moving a building staff, etc. after an event, the methods used to secure computer records and server operations, and how to get information to staff and customers in a timely manner about recent events. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-116 CAD Safety Applications (2 cr.)
Provides the student with a basic understanding of computer-aided drawing for safety plan development and response. Topics include vehicle flow and movement, fire alarm system mapping, evacuation route design, and process/system mapping. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-117 Intro to Emergency Management (3 cr.)
Explores the comprehensive world of emergency planning. This class introduces the student to both worlds of municipal and industrial emergency planning. Students will review expectations of OSHA, FEMA, and the Department of Homeland Security for emergency preparedness. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-118 OSHA Environmental Technology (2 cr.)
Introduces the student to the concepts of safe aspects of Environmental Technology. Other topics include worker training, hazardous chemicals and waste, and the relationship between the Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) Standards. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-119 Ergonomics (3 cr.)
Provides the student with an understanding of human engineering. The course will cover the methods to control repetitive motion injuries, office design, and the concept of ease and efficiency for industrial workers. Workstation design in the office and assembly line operations are a part of the class. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-120 Safety & Environmental Health (2 cr.)
Explores the things that individuals and society do at result in environmental health hazards. There is an emphasis on energy production and the risk associated with it. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-121 DOT Engineering (2 cr.)
Designed to introduce the student to ever changing regulations of the DOT. The course will cover Federal Motor Carrier Safety Regulations, entry-level driver requirements, drug and alcohol testing and reporting, and handling hazardous materials. The newest requirement, Transportation Safety Plans, are a part of the class. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-122 Introduction to the ISO 14000 Series (3 cr.)
Provides the student with the fundamentals associated with the ISO process. The course will review the general expectations of the process in regards to Safety, Health and Environmental challenges. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-123 Safety Risk & Prevention (3 cr.)
Provides the student with an understanding of federal and state regulations (EPA, OSHA, etc.) that have been developed to control the risk of environmental pollution and the potential for human exposure. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-124 Hazardous Materials & Waste Regulations (2 cr.)
Reviews 29CFR1910, subpart H requirement for hazardous materials and waste in the workplace. The course will also review the safety considerations found in Wisconsin DNR regulations. Focus will be given to emerging technologies. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-131 OSHA & Ethylene Oxide (1 cr.)
Provides the student with an understanding of the hazards presented by ethylene oxide, the requirements that OSHA has for workplace safety, and the expectations of the facility during an unplanned release. This course is designed to be delivered online. Alternate modes of delivery are available upon request.
10-449-178 Safety Internship - 1 Cr (1 cr.)
Incorporates having the student work in a safety role at a local employer. The position will provide support to the student and require a final report. The student will be evaluated by the employer who will provide input into the final grade. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

10-449-179 Safety Internship - 2 Cr (2 cr.)
Incorporates having the student work on a special project in a Safety Office at a local employer. The position will provide support to the project and provide a final report on the project status or completion. The student will be evaluated by the employer who will provide the final grade. This course is designed to be delivered online. Alternate modes of delivery are available upon request.

31-449-301 OSHA Construction Safety-30 Hour Outreach (1 cr.)
Describes OSHA policies, procedures and standards, as well as construction safety and health principles. Students learn skills to help recognize, evaluate and control hazards on the job site using OSHA standards as a guide. Includes how to perform construction tasks safely, and what to do if an accident occurs. OSHA-mandated Lockout/Tagout procedures are introduced. Upon successful completion, the student will receive a Department of Labor OSHA Construction Safety and Health 30-hour completion card.

31-449-304 Powered Industrial Truck Operator Training (2 cr.)
Introduces students to the skills needed to operate the most common powered industrial trucks (PIT) used on construction sites and OSHA standards. OSHA's Forklift Rule requires operators of powered industrial trucks to be trained in their safe operation. Learners will become proficient with the operation, inspection, precautions and maintenance of forklifts (rough terrain straight-mast and extended-reach), aerial work platforms (scissors lifts and boom lifts), skid steers and loaders. Training consists of classroom and hands-on instruction. This course, coupled with individual operator evaluation, meets OSHA standards and upon successful completion, the student will receive a Powered Industrial Truck Operator completion card.

455 Supervision-Management

10-455-101 Site Layout and Construction (CMT) (2 cr.)
Focuses on the materials, methods and equipment used in site construction. Topics include soil characteristics, survey practices, building layout, excavation and shoring, utility placement, engineered fill, and water management. Students learn to interpret codes, prints and specifications pertinent to site construction.

10-455-102 Introduction to Construction Management (CMT) (1 cr.)
Serves as an introduction to the construction management profession and the Construction Management program at FVTC. Provides students with an overview of residential, commercial and industrial construction practice prior to student co-op experience.

10-455-103 Construction Safety Management (CMT) (2 cr.)
Provides training in Occupational Safety and Health Administration (OSHA) standards. Teaches strategies for creating a successful safety management plan. Students receive their OSHA 10-hour Construction Safety card upon successful completion.

10-455-104 Construction Engineering Fundamentals (CMT) (3 cr.)
Covers the principles of statics and strength of materials required to understand basic construction engineering and solve simple design problems. Design problems include wood, steel and reinforced concrete frames.

10-455-105 Foundation System (CMT) (2 cr.)
Focuses on the materials, methods and equipment used in various foundation systems. Students will investigate various types of foundations used in buildings and other structures with an emphasis on concrete properties and principles. Students learn to interpret codes, prints and specifications pertinent to foundation construction.

10-455-106 Construction Estimating (CMT) (2 cr.)
Teaches students the basics of construction estimating with an emphasis on quantity takeoff procedures for both detailed and conceptual estimates. Additional topics include types of estimates, types of contracts and evaluation of subcontractors. Students use Microsoft Excel software to prepare a detailed estimate from a set of working drawings.
10-455-107 Construction Management Co-op 1 (CMT) (2 cr.)
Provides hands-on experience opportunity for the student to work with a residential, commercial or industrial contractor. Each student is responsible for securing his/her own employment with the assistance of the FVTC co-op coordinator. Students currently employed in the construction industry may receive credit for prior learning.

10-455-108 Construction Contracts and Law (CMT) (2 cr.)
Explores the legal aspects of construction. Topics include types of contracts, contract procedures and documents, responsibilities of contractors and owners, reporting requirements, insurance, bonds, and change order management.

10-455-109 Construction Scheduling (CMT) (2 cr.)
Teaches students to plan and schedule construction projects. Provides information on establishing schedule activities, durations and logic. Students will manually draw and calculate CPM (critical path method) schedules. Students are also introduced to computer-aided scheduling.

10-455-110 Structural Systems (CMT) (2 cr.)
Focuses on the materials, methods and equipment used in the frame of a structure. Topics include structural systems built from wood, steel and reinforced concrete. Students learn to interpret codes, prints and specifications pertinent to structural systems.

10-455-112 Exterior Enclosure Systems (CMT) (2 cr.)
Focuses on the materials, methods and equipment used in building enclosures. Topics include masonry, precast, metals, glazing and EIFS (exterior insulation and finish systems). Emphasis is on proper detailing to avoid moisture penetration. Students learn to interpret codes, prints and specifications pertinent to building enclosures.

10-455-113 Construction Project Management (CMT) (2 cr.)
Focuses on the day-to-day activities of managing a construction project emphasizing the importance of communication skills. Topics include progress meetings, submittals, field contract, RFI's (requests for information), change orders and project inspection.

10-455-115 Computer-Integrated-Construction (CMT) (2 cr.)
Introduces students to use of database technologies as a construction management tool. Students prepare estimates, create schedules and perform project controls using leading construction software. In addition, students are exposed to Autodesk’s REVIT software using building information modeling (B.I.M.) examples.

10-455-116 Sustainable Design and Construction (CMT) (2 cr.)
Introduces construction management students to LEED’s (Leadership in Energy and Environmental Design) Green Building Rating System. Information is presented on sustainable building practices which can be incorporated into project design, construction, operation and demolition.

10-455-117 Mechanical, Electrical & Plumbing Systems (CMT) (2 cr.)
Focuses on the materials, methods and equipment used in mechanical, electrical and plumbing systems. Additional topics include fire protection, communications and security systems. Students learn to interpret codes, prints and specifications pertinent to M.E.P. systems.

10-455-118 Interior Building Finishes (CMT) (2 cr.)
Focuses on the material, methods and equipment used to complete a building’s interior. Topics include framed partitions and falsework, masonry partitions, ceiling systems, floor coverings, interior millwork and hardware. Students learn to interpret codes, prints and specifications pertinent to building interiors.

10-455-119 Construction Management Co-op 2 (CMT) (2 cr.)
Provides hands-on experience opportunity for the student to work with a residential, commercial or industrial contractor. Each student is responsible for securing his/her own employment with the assistance of the FVTC co-op coordinator. Students currently employed in the construction industry may receive credit for prior learning.

10-455-120 Revit Architecture (CMT) (2 cr.)
Introduces students to principles of building information modeling through the utilization of Autodesk Revit Architecture. Basic entry level user skills and advanced modeling and documentation techniques will be mastered utilizing Autodesk Revit. Students will model commercial structures by creating a 3-D set of documents inclusive of plan, elevation, and section views including associated schedules and libraries.

10-455-121 Understanding Construction Drawings (CMT) (1 cr.)
Introduces graphic communication methods used in construction. Basic sketching techniques are taught along with basic drafting procedures. Students will use their knowledge in architectural and engineering techniques to interpret construction drawings.
10-455-122 Introduction to AutoCAD, Architecture (CMT) (2 cr.)
Introduces graphical user Interface of AutoCAD used for construction drafting. Basic sketching techniques are taught with CAD drafting procedures. Students will use AutoCAD software to prepare, dimension, annotate, plot and review construction drawings and details.

10-455-123 Construction Financial Management (CMT) (2 cr.)
Introduces the principles of financial management used by construction companies including budget management and cash flow. Emphasis is on the construction manager’s role in project profitability. Analyses of construction economic factors through cost, schedule and productivity management. Topics include project cash flow, billing, budget status reports, true profit and value engineering studies.

457 Metal Fabrication

10-457-103 Manufacturing Processes, Hot-Welding (2 cr.)
Introduces the hot-welding processes used in industry. Students examine the manufacturing of steel, heat treating, foundry work, casting, rolling, forging, extrusion and welding.

10-457-151 Manufacturing Techniques 1 (2 cr.)
Covers punching, shearing, sawing, drilling and cutting. Sub-assembly parts are produced using various types of equipment. The parts may be joined, by welding, to complete an assembly. Students work in a team environment to complete an assignment.

10-457-152 Manufacturing Techniques 2 (2 cr.)
Covers rolling, bending, and forming. Sub-assembly parts are produced using this equipment. The parts may be joined, by welding, to complete an assembly. Students are required to work in a team to complete an assignment. Where applicable, other joining processes are explored. It is recommended that the student have an ACCUPLACER Arithmetic score of 50 or greater or have completed GOAL Math or Math-Technical Basic (10-804-125) or Math Technical 1 (10-804-121) or College Technical Math 1A (10-804-113).

10-457-153 Fabrication Techniques 1 (2 cr.)
Allows students to fabricate a part from a blueprint and weld the assembly with a specified welding process. Cutting and forming may be required prior to assembly. Depending on the size and complexity of the project, students may be asked to work in a team to complete an assignment. It is recommended that students have completed or be enrolled in the following courses: Welding BPR & Symbols (10-621-133); Manufacturing Techniques 1 (10-457-151).

10-457-154 Fabrication Techniques 2 (2 cr.)
Allows students to fabricate and weld parts from a simple sketch that requires mathematical calculations. Cutting and forming may be required prior to assembly. Depending on the project, students may be asked to work in a team to complete an assignment. As time allows, students may also design and fabricate an individual project. It is recommended that students have completed or be enrolled in the following courses: Welding BPR & Symbols (10-621-133); Manufacturing Techniques 2 (10-457-152); Math-Technical Basic (10-804-125) or Math-Technical 1 (10-804-121).

10-457-160 Manufacturing Processes (2 cr.)
Covers punching, shearing, sawing, drilling, rolling, bending and forming. Sub-assembly parts are produced using various types of equipment. The parts may be joined, by welding, to complete an assembly. Students work in a team environment to complete an assignment. It is recommended that the student have an ACCUPLACER Arithmetic score of 65 or greater or successful completion of equivalent Program Prep course or College Technical Math 1A (10-804-113) or College Technical Math 1 (10-804-115).

10-457-161 Cutting Processes (2 cr.)
Covers laser cutting, abrasive water jet cutting, oxy-fuel cutting, plasma arc cutting and air-carbon arc cutting. Individual parts are produced using computerized and manual equipment. The parts may be joined, by welding, to complete an assembly. Students work in a team environment to complete an assignment.

10-457-162 Pattern Drafting Processes (2 cr.)
Covers the fundamentals of parallel line, radial line and triangulation. Both hand drawing pattern development with a computer and software pattern development are emphasized. Students transfer drawings to sheet metal and fabricate fittings. Fittings are joined by welding. When enrolling in this course, it is required that the student has taken or is concurrently taking Cutting Processes (10-457-161) and Welding BPR & Symbols (10-621-133).

10-457-163 Manufacturing Enterprise (2 cr.)
Covers the methods and process involved in manufacturing production parts. The course is set up to operate like a production fabrication facility where the student fabricates a product based on customer's specification. Products that are developed must meet customer's quality expectations. When enrolling in this course, it is required that the student has taken or is concurrently taking Fabrication Techniques 1 (10-457-153) and Manufacturing Processes (10-457-160).
458 Truck Driving - Contracts

30-458-316 CDL Truck Driving Semi A-144 (4 cr.)
This is the first of three courses in the 10-week Truck Driving program. It prepares students for entry-level positions as commercial drivers and focuses on basic information about trucks and their operation. A DOT physical exam and drug test will be required on the first day of class.

30-458-321 CDL Truck Driving Semi B-144 (4 cr.)
Prepares students for entry-level positions as commercial drivers and focuses on basic information about trucks and their operation.

30-458-322 CDL Truck Driving Semi C-144 (4 cr.)
Prepares students for entry-level positions as commercial drivers and focuses on basic information about trucks and their operation.

30-458-340 CDL Straight Truck - 172 HR (5 cr.)
Prepares learners to obtain a Class B commercial driver’s license that enables them to operate such vehicles as delivery trucks, garbage trucks, buses, dump trucks and petroleum trucks. This course focuses on pre-trip vehicle inspections, defensive driving habits, gear shifting, backing skills, industry regulations and safe maneuvering skills.

31-458-305 CDL Truck Driving Semi-2 (2 cr.)
Provides the skills that technicians need to perform on-road testing and diagnostics with straight trucks. Pre-trip inspection procedures, laws, backing exercises, shifting and driving techniques with a straight truck will be covered.

461 Small Engine & Chassis Mechanic

10-461-102 Small Engines, Introduction to (1 cr.)
Provides the student with theory and hands-on experience with gas outdoor power equipment. Fuel, cooling, lubrication and DC electrical systems will be emphasized.

10-461-103 Turf Grass Equipment (2 cr.)
Focuses on the repair and maintenance of the equipment used in turf grass and landscaping. Reel and deck mowers, pulverizers, power rakes and seedling devices are discussed. Safety glasses are required.

10-461-112 OPE Four-Cycle Small Engines (3 cr.)
Gives an in-depth overview of engine design and operational theory. Parts identification, function and repair are incorporated into the disassembly, reconditioning and assembly of small air-cooled engines. Safety glasses are required.

10-461-113 OPE Hydraulics and Drivelines (3 cr.)
Focuses on the equipment used in groundskeeping, landscaping and maintenance of turf grass. Belt, gear, and hydrostatic transaxles and drivelines for lawn mowers, tillers, snowblowers, garden tractors, zero-turn mowers and compact tractors are included in this course. Safety glasses are required.

10-461-114 OPE Operation & Maintenance (2 cr.)
Focuses on maintaining and operating skid steer loads, forklifts, till-handlers, turf mowing equipment and landscape equipment. The course provides operators’ certification. Safety glasses are required.

10-461-115 OPE Handheld Power Units (3 cr.)
Emphasizes the repair of two-cycle and small four-cycle engines used on chainsaws, cutoff saws, line trimmers, backpack blowers, hedge trimmers and other small power units. Students will learn new emission requirements and understand the current laws on product liability. Safety glasses are required.

10-461-116 OPE DC Electrical Systems (3 cr.)
Covers Ohm’s law and electrical theory, operation and troubleshooting methods for batteries, starting circuits, charging circuits and accessories. Safety glasses are required.

10-461-118 OPE Diesel Engine Systems (3 cr.)
Provides technicians with skills and knowledge of gas and diesel engine theory, fuel, electrical, coding and lubrication systems.

10-461-120 OPE-ATV/Utility Vehicle Service & Repair (3 cr.)
Provides technicians with a solid foundation in the field of ATV/Utility vehicle service and repair. It gives a general overview of both theory and repair of all systems used in ATV/Utility vehicles. Curriculum includes engine removal, disassembly and assembly, transmissions, ignition system testing and component replacement, carburetor disassembly and assembly, differentials, gear cases, brakes, and troubleshooting. This course is part of an advantage certificate that requires students to have completed a program in Outdoor Power Equipment, Ag Power Equipment, Automotive Repair, Diesel Technology, or have approval by the instructor.
10-461-121 OPE-Snowmobile Service & Repair (3 cr.)
Provides technicians with a solid foundation in the field of snowmobile service and repair. It gives a general overview of both theory and repair of all systems used in snowmobiles. Curriculum includes engine disassembly and assembly, CDI and 3-D ignition and how they work, EFI troubleshooting and repair, engine timing procedure, drive system theory and troubleshooting, suspension systems, and gas shocks. This course is part of an advantage certificate that requires students to have completed a program in Outdoor Power Equipment, Ag Power Equipment, Automotive Repair, Diesel Technology, or have approval by the instructor.

10-461-122 OPE Customer Service & Sales (2 cr.)
Focuses on the importance of the customer and develops customer service skills. Applies retail sales principles and emphasizes the importance of knowing the product’s features, prospecting clients, presenting the product and closing the sale.

10-461-140 Intro to OPE and Power Sports Technician (3 cr.)
Introduces students to program outcomes and requirements and reviews student handbook and program expectations.

10-461-141 Parts and Service Management (3 cr.)
Utilizes computer software programs such as PartSmart and Web-based programs to learn how to look up parts and create parts invoices. Includes methods of merchandizing products for increased sales, and utilizes a computer software, DealerWin, to develop service orders, invoice repair orders and develop a customer data base.

10-461-142 Internship in OPE and Power Sports (3 cr.)
Prepares students with job-seeking skills and provides students with actual on-the-job training with required outcomes. Gives students hands-on experience in real work places.

480 Renewable Energy-Foundations

10-480-101 Renewable Energies, Overview (2 cr.)
Provides an overview of renewable energy and introduces students to various applications involving solar (thermal and photovoltaic), hydroelectric, wind, geothermal, and energy from biomass-biofuels. Issues relevant to energy management applications are discussed, with an emphasis on energy conservation.

10-480-102 Renewable Energy-Agriculture (3 cr.)
Provides instruction in making, processing, and testing of Biofuels for agricultural diesel applications. Used vegetable fry oil will be processed into Biodiesel and raw oil will be extracted from feedstocks. Fuel standards, safety and handling will be covered. In-class engine performance testing of the fuels will be done.

10-480-105 Sustainability Assessment & Design (2 cr.)
Begins the process of understanding a site and the power uses and losses that exist. The course will review the techniques for determining the power generation, power loss and corrective actions. The student will use that data to prepare a sustainability report that provides an outline of the existing power uses and what corrective actions can improve the situation. After the first session, students set their own attendance and study schedule.

10-480-107 Energy Audit Business (1 cr.)
Provides learners with the tools to begin their careers in the energy auditing business. Topics include business planning and start up, customer relations, employee relations, marketing, defining the work scope, contracts and preparing a customer proposal. Also included are utility bill analysis, financial incentives and tax credits, and industry certifications. Management applications are discussed with an emphasis on energy conservation.

10-480-108 Energy Audit Techniques 2 (3 cr.)
Introduces students to the types of energy audits, including advanced energy audit techniques using blower doors, duct blasting, thermal imaging, software tools, energy management and more. Students practice by conducting labs using the equipment studies and then by taking their skills out to an existing residential dwelling to complete a full energy audit. Common problems, solutions and considerations are also discussed.

10-480-109 Energy Audit Techniques 1 (3 cr.)
Introduces students to the industry overview, Weatherization Assistance Programs and the various certifications available. Reviewing safe work practices, construction math, energy principles and building science will also be covered. The course focuses on building types, materials and tools, common lighting and efficiency, HVAC, appliances, water heaters, insulation, doors and windows.
481 Energy & Environmental Engineering Technology

10-481-102 Carbon Footprint Reduction Management (3 cr.)
Focuses on the ISO standards on Carbon Footprint Development. Many companies use this standard to understand power consumption and usage. The student will develop a carbon footprint report for a simulated facility. After the first session, students set their own attendance and study schedule.

10-481-103 Process Development Application (2 cr.)
Applies the lessons from the earlier courses, Students will develop a Sustainability plan for the emerging technology of their choice. The plan will take into consideration the site, the County, State and Federal regulations that will apply. Lastly, the student will identify the current carbon footprint of the site and determine if the emerging technology is appropriate at the site. After the first session, students set their own attendance and study schedule.

10-481-104 Fundamentals of Energy (2 cr.)
Introduces the learner to the sources of energy, the use of energy in industrialized society and the environmental impact of various energy sources. Reduce, reuse, recycle and renewable are introduced as a prioritization strategy. Students will learn several sources of energy and examine the most cost effective and environmentally friendly application of each to heating, transportation and electricity production.

10-481-105 Sustainability as a Business Strategy (3 cr.)
Teaches students how to gain a competitive advantage through the use of sustainable business practices. This course will cover, but not be limited to, sustainable development, triple bottom line and eco-efficiency. Students will learn how to reduce business risk through using natural materials and allowing natural regeneration. Reduce, reuse, recycle, renewable are key business strategies today, which are responsive to customer, employee and stockholder demands.

10-481-106 Energy Production & Use (3 cr.)
Allows the participants to learn about and quantify many potential sources of energy, their advantages, disadvantages and their environmental impact. The student will then apply the knowledge to develop a comprehensive, sustainable energy strategy for a small business.

10-481-107 Energy & Environmental Conservation (3 cr.)
Focuses on conservation, the most economical and environmentally friendly solution to energy management. Energy audits for home and businesses are explored, and the results are used to prioritize potential energy reduction projects. Building efficiency standards and the conservation of water are analyzed.

10-481-108 Economics & Procurement of Energy (3 cr.)
Teaches the participant to quantify the economic impact of various energy sources, and the payback of various energy projects and approaches. The economics of reduce, reuse, recycle and renewable will be explored and applied to a small business through casework. The economics of energy procurement will be explored, including time of day rates and peak load factors.

482 Renewable Energy-Electricity

10-482-101 Intro to Wind Systems (3 cr.)
Prepares the learner to assess the global energy picture; analyze the causes of wind and wind flow properties; explore small, medium, and large wind turbine designs; assess the environmental effects of wind turbines; perform business and site assessments for a wind turbine project, plan your wind turbine project, evaluate, operation and maintenance of the turbine system, and analyze the future of wind energy.

10-482-102 Photovoltaic Basics & Safety (1 cr.)
Provides detail of photovoltaic (PV) system types, components, batteries, controllers, and inverters. Participants will learn how PV systems work and recognize the best application for each system type. This course is one of a series of three designed to prepare individuals to sit for the North American Board of Certified Energy Practitioners (NABCEP) Entry Level Certificate Program Exam.

10-482-103 Photovoltaics, Intermediate (1 cr.)
Teaches participants design and installation methods, including system layout, sizing, wiring, and connections by assembling a small photovoltaic (PV) system. This course is second in a series of three designed to prepare individuals to sit for the North American Board of Certified Energy Practitioners (NABCEP) Entry Level Certificate Program Exam.
Course Descriptions

10-482-104 Photovoltaic Design & Installation (2 cr.)
Teaches participants to apply National Electrical Code requirements, installation techniques, and safety practices by installing a photovoltaic system on a training roof or residential construction project. This course is third in a series of three designed to prepare individuals to sit for the North American Board of Certified Energy Practitioners (NABCEP) Entry Level Certificate Program Exam.

10-482-120 Wind Technician 1 Lab (1 cr.)
Prepares the learner for work at height. Students will perform equipment maintenance on climbing and fall arrest gear; wear required PFPE, PPE and outdoor apparel when working on a wind energy system; review the causes and results of workplace accidents and injuries; demonstrate adequate health and wellness for climbing and working at height; demonstrate safe climbing methods; demonstrate proper "ground crew" working habits; and tie basic rigging knots.

10-482-122 Wind Technician 2 (1 cr.)
Will give the learner ENSA certification in safe access, rescue, and confined spaces. The learner will review current legislation and requirements for work at height; complete a risk assessment; demonstrate proper rigging techniques for rescue equipment; perform a ladder rescue; perform rescues from a wind turbine nacelle, hub and glade; perform a self-rescue; complete a confined space permit; assemble and test a respirator; and use a monitor to test air quality.

10-482-124 Wind Technician 3 (1 cr.)
Certifies the learner in torque techniques through Snap-On Tools. The student will apply safe and proper technique with use of a click-type torque wrench, dial-type torque wrench, torque screwdriver, torque adapter, and torque extensions; verify appropriate torque techniques on electronic test bench; apply proper technique with the Techangle wrench; and demonstrate safe and proper torque technique using the Hytorc equipment.

10-482-126 Wind Technician 4 (3 cr.)
Strengthens the electromechanical skills of the learner by reviewing arc flash requirements, power quality, power factor correction, transformer calculations, and electrical distribution and transmission systems. Students will explore drive trains used in wind turbines; analyze the causes and results of gear failures; demonstrate proper techniques for gearbox and generator alignment; and compare and contrast synchronous and induction generators.

10-482-128 Wind Technician 5 (2 cr.)
Will have the learner working with data collected from wind energy systems at LTC using Microsoft Excel, wind energy calculators, and MET tower software. Participants will determine energy production, wind speeds, and wind direction; produce power curves; calculate wind shear; analyze rotor wash, estimate availability and capacity factor of a wind system; estimate payback and return on investment for wind systems, and create charts and graphs to summarize the data.

10-482-130 Wind Site Assessment (1 cr.)
Reviews the basics of site assessment covered in Intro to Wind, but adds more details and techniques on doing a thorough site assessment that is the same quality standard used by the MREA and Focus on Energy. Similar Site Assessment requirements are found throughout the United States for those who want to use grant money to install a wind energy system. This course prepares the learner to become a certified site assessor.

10-482-132 Wind (Small) Turbine Maintenance (1 cr.)
Prepares the learner for servicing a variety of small wind turbines. Participants will climb and inspect towers, torque fasteners, check lubrication in gearboxes, add grease to moving and exposed parts, verify good electrical connections, and perform an overall "system check" on a wind energy system as part of routine maintenance. Some work will be done on campus; other turbines are located off site. Travel is required.

501 General Health

10-501-101 Medical Terminology (3 cr.)
Focuses on the component parts of medical terms: prefixes, suffixes and word roots. Students practice formation, analysis and reconstruction of terms. Emphasis on spelling, definition and pronunciation. Introduction to operative, diagnostic, therapeutic and symptomatic terminology of all body systems, as well as systemic and surgical terminology.

10-501-106 Holistic Health for Health Care Providers (1 cr.)
Introduces health care providers to the concept of holistic health practices. Analyzes holism and the holistic model for health care. Relates concepts to the health care provider as an instrument of healing. Explores the dialectic relationship of health-wellness-disease illness. Selected holistic modalities, therapies and healing arts will be explored.
10-501-109 Medical Law, Ethics & Profess (2 cr.)
Prepares students to display professionalism and perform within ethical and legal boundaries in the health care setting. Students maintain confidentiality, examine legal aspects of the medical record, perform risk management procedures, and examine legal and bioethical issues.

10-501-153 Body Structure and Function (2 cr.)
Introduces the basic normal anatomy and physiology of the human body essential for nursing practice. Medical terminology is introduced and plays a significant role in the course. Medical Terminology (10-501-101) is recommended but not required.

10-501-182 Human Diseases for Health Care Professions (3 cr.)
Focuses on the common diseases of each body system as encountered in all types of health care settings by health information professionals. Emphasis is placed on understanding the etiology (cause), signs and symptoms, diagnostic tests, and treatment (including pharmacologic) of each disease.

10-501-190 Health Careers, Introduction to (1 cr.)
Examines health-related careers. Educational preparation, job responsibilities and appropriate personal attributes will be surveyed in order to assist participants in career decision planning. Health career programs which Fox Valley Technical College offers will be highlighted.

31-501-308 Pharmacology for Allied Health (2 cr.)
Introduces students to classifying medications into correct drug categories and applying basic pharmacology principles. Students apply basic pharmacodynamics to identifying common medications, medication preparation, and administration of medications used by the major body systems.

503 Fire Technology

10-503-101 Technical Rescue (4 cr.)
Exposes the student to labor-intensive requirements in team-based technical rescue. Students will be trained in rope rescue, confined space rescue and trench rescue to the technician level.

10-503-103 Hazmat Awareness & Operations (2 cr.)
Identify the classification hazardous materials, determine the nature and extent of the problem, and protect first responders, nearby persons, and the environment from the effects of the release.

10-503-130 Fire Protection Internship (2 cr.)
Provides an opportunity for students to perform the duties of a municipal firefighter while serving the typical 24-hour shift, excluding FVTC class periods, at one of several fire departments. Fire department officers evaluate student performance. Department consent required.

10-503-131 Fire Protection Internship - Extended (2 cr.)
Provides an opportunity for students to perform the duties of a municipal firefighter while serving the typical 24-hour shift, excluding FVTC class periods, at one of several fire departments. Fire department officers evaluate student performance.

10-503-132 Fire Protection Independent Study 1 (1 cr.)
Requires the learner to research and write an 8-10 page report on a topic in the fire protection field. The student reviews the literature, surveys expert opinion, searches the Internet and consults with the instructor. Department consent required.

10-503-133 Fire Protection Independent Study 2 (1 cr.)
Requires the learner to research and write an 8-10 page report on a topic in the fire protection field. The student reviews the literature, surveys expert opinions, searches the Internet and consults with the instructor. Department consent required.

10-503-134 Health and Wellness for Firefighters (1 cr.)
Provides tools to use in making lifestyle choices for health and wellness. Introduces topics such as the concepts of health, stress, common disease, lifestyle choices affecting health and self-care.

10-503-135 Firefighter Fitness (1 cr.)
Assess existing physical fitness abilities; improve upon the existing physical fitness level; and survey requirements for fire department physical agility testing as part of the hiring process.

10-503-139 Principles of Emergency Services (3 cr.)
Provides an overview to fire protection; career opportunities in fire protection and related fields; philosophy and history of fire protection/service; fire loss analysis; organization and function of public and private fire protection services; fire departments as part of local government; laws and regulations affecting the fire service; and fire service nomenclature.
Course Descriptions

10-503-142 Fire Fighting Principles (4 cr.)
Describes basic fire behavior, techniques used to control structural and related fire emergencies, and life safety practices. Students perform all practical evolutions necessary to control and extinguish fires and otherwise meet all requirements for Firefighter I certification with the State of Wisconsin.

10-503-143 Building Construction (3 cr.)
Provides the components of building construction that relate to fire and life safety.

10-503-147 Fire Protection Systems (4 cr.)
Provides information relating to the features of design and operation of fire detection and suppression systems.

10-503-151 Fire Prevention (4 cr.)
Provides fundamental information regarding the history and philosophy of fire prevention, organization and operation of a fire prevention bureau, use of fire codes, and identification and correction of fire hazards. Meets all requirements for Fire Inspector I certification with the State of Wisconsin.

10-503-152 Hazardous Materials (4 cr.)
Examines characteristics relating to hazardous materials including problems of recognition and mitigation. Prepares students to Hazardous Materials Technician Level.

10-503-155 Fire Protection Hydraulics (4 cr.)
Provides a foundation of knowledge in order to understand the principles of the use of water in fire protection. Meets all of the requirements for Driver Operator-Pumper certification with the State of Wisconsin.

10-503-156 Strategies, Tactics, and Incident Management (4 cr.)
Provides an in-depth analysis of the principles of emergency response through utilization of an incident management system. Prepares students to pursue current national ICS training requirements.

10-503-157 Fire Investigation (3 cr.)
Provides learners with the fundamentals and technical knowledge needed for proper fire scene investigations.

504 Criminal Justice - Contracts

10-504-100 Employment Standards (2 cr.)
Designed for students seeking employment in such public or private emergency services as law enforcement, firefighting, security and emergency medical services. This course requires practical application of classroom information pertaining to employment applications and interviews as well as physical fitness.

10-504-102DE Crime Prevention Surveys (2 cr.)
Conduct basic crime prevention surveys on smaller businesses to identify security-related vulnerabilities and recommended solutions. Students will learn the mechanics of completing a survey form and use the form for their surveys. Students will be required to identify 2-3 cooperating business entities to complete the requisite survey work.

10-504-104 Business Crime Prevention (3 cr.)
Addresses security problems that affect commercial business. This course deals with specific problems such as burglary, robbery, shoplifting, check fraud, credit card fraud, safe selection, counterfeiting, and burglar resistant glazing materials.

10-504-104DE Business Crime Prevention (3 cr.)
Addresses security problems that affect commercial business. This course deals with specific problems such as burglary, robbery, shoplifting, check fraud, credit card fraud, safe selection, counterfeiting, and burglar resistant glazing materials.

10-504-107 Security Survey Applications (3 cr.)
Designed to examine the security and risk management applications of a business entity and how they interrelate. Students will be exposed to the analysis of risk and the principles of security surveys, emergency management, and concluding with the planning and management of physical security installations.

10-504-107DE Security Survey Applications (3 cr.)
Designed to examine the security and risk management applications of a business entity and how they interrelate. Students will be exposed to the analysis of risk and the principles of security surveys, emergency management, and concluding with the planning and management of physical security installations.
10-504-108 Physical Security Applications (3 cr.)
Studies the applications of all forms of physical security equipment used in the security profession. Areas of concentration include security lighting, barriers, security design, locks, entry control, cargo security, guard forces and the integration of these forms.

10-504-108DE Physical Security Applications (3 cr.)
Studies the applications of all forms of physical security equipment used in the security profession. Areas of concentration include security lighting, barriers, security design, locks, entry control, cargo security, guard forces and the integration of these forms.

10-504-109 Electronic Security Applications (3 cr.)
Studies the applications of all forms of electronic equipment used in the security profession. Areas of concentration include interior and exterior intrusion sensors, video, access control, contamination sensors, personnel screening devices, voice and data communications, and the integration of such equipment.

10-504-109DE Electronic Security Applications (3 cr.)
Studies the applications of all forms of electronic equipment used in the security profession. Areas of concentration include interior and exterior intrusion sensors, video, access control, contamination sensors, personnel screening devices, voice and data communications, and the integration of such equipment.

10-504-110 Crime Scene Mgmt/Forensic Evidence, Intro to (3 cr.)
Explores the applications of science in the field of crime scene management from the crime scene to the courtroom and beyond. Students will focus on the examination and reconstruction of various crime scenes with the emphasis on the identification, collection, documentation and preservation of physical evidence.

10-504-111DE Professional Security Surveys (2 cr.)
Conduct advanced security surveys on medium to large business entities. Students identify physical security, safety, retail financial, and related procedural issues and vulnerabilities to the business and then create a detailed, written survey making appropriate recommendations for mitigation and/or prevention. Students will complete 1-2 surveys. Student must identify cooperating business entities that will allow a detailed security examination of their company.

10-504-112DE Criminal Investigation Theory (3 cr.)
Presents the study of the fundamentals of criminal investigations, search and recording of the crime scene, and principles involved in collection and preservation of physical evidence. Knowledge, use and function of scientific aids in crime detection, the importance of criminal's modus operandi, development of sources of information, and the place of the criminal informant are described. Criminal investigation procedures for major felony cases are discussed.

10-504-114 Tactical Operations (3 cr.)
Focuses on the patrol officer and procedures. Topics include observation and perception, types of patrol, proper death notification procedures, responding to crimes in progress, the tactical concept response, high-risk stop procedures and OWI traffic stops. This is a law enforcement certification course and attendance is mandatory. Duty belts, holsters and handcuffs are required for the hands-on arrest portion of the course.

10-504-115D1 Criminal Law - National (3 cr.)
Examines the general principles of criminal law and the elements of crime. Students attempt to recognize when a crime has occurred, focusing on statutes that are most often used by a security professional. Students also work with the criminal statutes from the state in which they reside.

10-504-116DE Juvenile Law (Internet) (3 cr.)
Deals with the philosophy, legal concepts, practices and policies of the agencies with which police interact in the justice system.

10-504-117 Professional Police Communication (2 cr.)
Focuses on developing communication skills related to conflict resolution. Instruction is presented in interviewing, interrogating, courts testimony and court decorum.

10-504-118DE Security Life Safety (2 cr.)
Learn those life safety issues that affect physical security hardware recommendations. Apply those principles to settings in the business world as they relate to current and recommended physical security hardware. Students will visit business establishments to view and identify related instructional units.

10-504-120 Law Enforcement Writing (2 cr.)
Teaches the importance of, and how to, prepare a professional law enforcement report. Students are exposed to various reports utilized by Wisconsin law enforcement agencies.
10-504-122 Biological & Trace Evidence (3 cr.)
Provides the student with the knowledge of protecting, recognizing, documenting, collecting, preserving and analysis of biological and trace evidence. Students will learn about the different types of biological evidence and trace evidence that can be used to assist in criminal investigations. This course deals with the real science and myths of DNA along with the identifying suitable types of evidence for DNA analysis.

10-504-123 Security Law (3 cr.)
Examines the legal principles applicable to the security field. Included are the legal topics of negligence, intentional torts, agency and business liability for 3rd party acts. In addition, the student will learn about probable cause, arrest, search and seizure, and interrogation from a private security perspective.

10-504-124 Interview & Interrogation (3 cr.)
Covers legal issues and a working knowledge of interview and interrogation techniques in agreement with current legal stipulations. Learn various forms of communications including verbal and nonverbal, as well as written statement analysis. Students will be instructed in appropriate interview techniques, the interviewing of victims and witnesses and interrogation techniques. Characteristics of the sociopath/psychopathic personality types will be examined. Students will also learn how to prepare for and testify in a court of law.

10-504-126DE Criminal Deviant Behavior (3 cr.)
Designed as a critical examination of the nature and extent of deviant behavior in our societies. Particular attention will be given to the causes and consequences of deviant behavior and to the social relations and processes associated with the more common forms of deviant and criminal expression within American society. In-depth study of sexual abuse of children by situational and preferential molesters. Case examples will be discussed.

10-504-127DE Investigation of Child Abuse (2 cr.)
Examines, studies and researches the different types of child abuse that exist within our society. Pivotal to this course will be the multiple causes of child abuse and identifying the dynamics of child abuse, such as physical abuse, sexual abuse, child neglect, mental harm, child mortality, abducted children and Internet child exploitation. Major emphasis is on identifying the suspect or primary care provider and understanding the implementation of an effective protocol and multidisciplinary team approach that is the basis for an effective investigation of any child abuse case.

10-504-128DE Forensic Application Child Abuse Investigations (2 cr.)
Explores the role of forensics and scientific crime scene investigation of child abuse cases. Emphasis is on identification and detection methods and the collection and gathering of evidence. This course also examines cybercrime and legal considerations facing law enforcement and cyber-security professionals in dealing with discovering, investigating and prosecuting cybercrimes within child abuse.

10-504-130 Law Enforcement Physical Fitness (1 cr.)
Assesses student fitness abilities and provides a fitness program designed to increase students' performance in the physical fitness assessment conducted during agency hiring processes. Instruction related to nutrition, disease, stress and injury prevention will be provided.

10-504-131 Basic Crime Scene Photography (3 cr.)
Designed to develop basic skills in preparing effective crime scene photographs and to instruct the student in the type of photographs necessary, as well as the lighting needed for good crime scene photography. This course will educate the crime scene investigator, homicide detective, sworn law enforcement officer, rape detective, arson investigator, domestic violence investigator, and other law enforcement personnel in the aspects of photography and provide the skills needed to apply this technology in the crime scene investigation field and/or related areas.
10-504-131DE Basic Crime Scene Photography (3 cr.)
Designed to develop basic skills in preparing effective crime scene photographs and to instruct the student in the type of photographs necessary, as well as the lighting needed for good crime scene photography. This course will educate the crime scene investigator, homicide detective, sworn law enforcement officer, rape detective, arson investigator, domestic violence investigator, and other law enforcement personnel in the aspects of photography and provide the skills needed to apply this technology in the crime scene investigation field and/or related areas.

10-504-132DE Principles of Retail Security (3 cr.)
Examines loss prevention issues related to retail business. Students will study the techniques used by shoplifters and employees to steal merchandise from a business and identify related recommendations for prevention. Further examination is made for losses related to vendors, shippers and accounting errors.

10-504-133 Forensic Science Applications (3 cr.)
Explores the applications of science in detecting crimes and in establishing proof in court. This course includes practical lab work. Students work on the following skills: identification, documentation, collection and preservation of physical evidence from the crime scene to the lab and the courtroom.

10-504-133DE Forensic Science Applications (3 cr.)
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10-504-1342 Private Investigations, Introduction to (3 cr.)
A study of investigations in the private and corporate sectors. Topics include investigative techniques relating to open record laws and searches, techniques of surveillance, employee screening, evidence collection, insurance fraud investigations, interviewing techniques, sources of information, and computer and other technology used in research. Applicable state statutes of attendees will be researched, and licensing requirements discussed.

10-504-142DE Private Investigations, Intro (3 cr.)
A study of investigations in the private and corporate sectors. Topics include investigative techniques relating to open record law and searches, techniques of surveillance, employee screening, evidence collection, insurance fraud investigations, interviewing techniques, sources of information, and computer and other technology used in research. Applicable state statutes of attendees will be researched, and licensing requirements discussed.

10-504-143DE CPTED Applications (2 cr.)
Examines the built environment in the study of Crime Prevention Through Environmental Design (CPTED). Students will learn how the physical design of buildings, parking lots, entry ways, streets and even subdivisions can affect the level of crime in the surrounding area. Students will examine their own environment for examples of CPTED, apply it to the proper principles, and identify corrective measures.

10-504-144DE Security Officer Fundamentals (3 cr.)
Focuses on the roles and responsibilities of security officers charged with maintaining the safety of people and property in their employment. Patrol, traffic, searches, observations, reporting procedures, communication issues, ethics, crime response and management, and use of force will be studied for application to the private security world.

10-504-146 Impression Evidence (3 cr.)
Focuses on the many different types of two/three dimensional impression evidence (footwear, fingerprints, tool marks, tire tread, etc.) found at crime scenes, detection/recovery techniques in the field and examinations in the lab and beyond to include the courtroom. Students will have practical hands-on applications (casting, lifts, etc.) with the collection techniques used in the field and lab environment. This will aid the student in developing tools and technologies to enhance their abilities to identify, document, collect and preserve impression evidence.

10-504-148 Loss Prevention, Principles of (3 cr.)
Studies issues relating to workplace violence, sexual harassment, employee theft, computer security, consumer fraud, business disaster recovery, substance abuse, negligent hiring and other relevant issues.

10-504-148DE Loss Prevention, Principles of (3 cr.)
Studies issues relating to workplace violence, sexual harassment, employee theft, computer security, consumer fraud, business disaster recovery, substance abuse, negligent hiring and other relevant issues.
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10-504-149 Law Enforcement Issues (2 cr.)
Covers the latest developments in criminal justice employment. This course is designed to give prospective law enforcement officers a realistic view of related occupations. Topics include liability, affirmative action, organized unions, statutes relating to employment in various agencies, stress factors, agency policies, civil rights of employees, ethics, and automation and technology.

10-504-150 Defensive Tactics (2 cr.)
Present the proper use of physical tactics in controlling an individual. Topics include verbalization skills, empty-hand prisoner control, handcuffing and appropriate use of equipment.

10-504-151 Firearms (2 cr.)
Demonstrates a law enforcement officer’s application of a firearm. Firearm techniques, tactics and the use of deadly force are discussed. Successful completion of this course satisfies the basic requirements of the Wisconsin Department of Justice for law enforcement certification.

10-504-152 Terrorism and Emergency Planning (3 cr.)
Provides the security professional with the necessary knowledge to give information, direction and guidance in the areas of threat identification, natural and man-made emergency operations planning, and counter-terrorism response.

10-504-159 Crash Scene Investigation (3 cr.)
Teaches the importance of crash scene management as a crime scene management application. Students are exposed to response, recognition, documentation, collection and preservation of evidence techniques. Topics include reports, legal aspects, manual and laser measuring techniques, plotting methods, manual and computer-aided diagramming, evidence collection, approach speed, approach angle, crush evaluation, departure angle, drag factor, percent braking, post-collision speed, scrape, skid, test skids, etc.

10-504-160 CJEDI: Management Principles and Leadership (2 cr.)
Designed for law enforcement personnel pursuing a career as a management executive in the field. This course satisfies the basic requirements of the Wisconsin Department of Justice for law enforcement certification.

10-504-161 CJEDI: Professional Growth and Development (2 cr.)
Is designed for law enforcement personnel pursuing a career as a management executive in the field. This course covers the importance of personal and professional growth and development of managers and the people they lead. Areas included are managing by priority, the Seven Habits of Highly Effective People, team leadership and team building, and personal and professional ethics.

10-504-162 CJEDI: Managing the Planning Process (2 cr.)
Designed for law enforcement personnel pursuing a career as a management executive in the field. This course will cover strategic planning for law enforcement agencies, team building, project management, and effective research and business writing techniques.

10-504-163 CJEDI: Human Resource Development (2 cr.)
Designed for law enforcement personnel pursuing a career as a management executive in the field. This course will cover labor issues in the employee selection process, employee disciplinary process procedures, discipline in policing, safeguarding management’s rights, and management’s role in the labor relation’s process.

10-504-164 CJEDI: Resource Allocation and Budgeting (2 cr.)
Designed for law enforcement personnel pursuing a career as a management executive in the field. This course covers general and specific budgeting principles, as well as strategic and operational planning related to law enforcement.

10-504-165 CJEDI: Management of Operations (2 cr.)
Designed for law enforcement personnel pursuing a career as a management executive in the field. This course will cover operational structures of local, state and national law enforcement agencies as well as the operational management of each entity.

10-504-166 CJEDI: Building Community Support (2 cr.)
Designed for law enforcement personnel pursuing a career as a management executive in the field. This course will cover managing community/problem oriented policing and will focus on comprehensive strategies in juvenile operations and community policing. In addition, media relations and the power, politics and the law enforcement administrator will be covered.
10-504-167 CJEDI: The Future of Law Enforcement (2 cr.)
Designed for law enforcement personnel pursuing a career as a management executive in the field. This course will cover technology and futuristics including the use of the Internet in law enforcement. This course will highlight the 21st Century Policing Project.

10-504-168 Property/Evidence Management (2 cr.)
Focuses on the applications of all forms of property and evidence management systems that include a number of key stages from the piece of property/evidence's acquisition to its eventual disposal. Students will learn versatile time saving tools for managing property, evidence, and equipment through warehousing and inventory control. Develop formal standards for the management, administration, handling of property/evidence and benchmark references specific to the initial property/evidence handling procedures and life time standards for an organization.

10-504-169 Forensic Science Internship (1 cr.)
Exposes the student to on-the-job situations and experiences in the forensic science arena that is dedicated to the education, enrichment and development of emerging forensic scientists and future leaders of the field. This provides an avenue for new forensic technicians to interact with and become part of the established forensic science community through placement locations in private; state and federal crime labs; and with local, state and federal law enforcement and corrections agencies.

10-504-170DE Correctional Administration (3 cr.)
Teaches students the basics of the role of the administrator in a correctional facility. Topics include the role of the correctional supervisor, human resource management, strategic planning, policy development and inmate management.

10-504-171DE Correctional Institutions (3 cr.)
Teaches students about the history and present practice of the correctional institution. Topics include the development of prisons, the penal system, inmate profiles and special groups, as well as prison programs and services.

10-504-172DE Correctional Sociology (3 cr.)
Teaches students the sociology of the correctional institution's inmate population & staffing. Topics include the admission process, adjustment to confinement, formal and informal organizations, violence and suicide prevention and the supervision of special offenders. The course covers both adult and juvenile populations.

10-504-173DE Correctional Law (3 cr.)
Teaches students the laws and regulations affecting the correctional institution. Topics include understanding the Federal and State Court System, criminal and civil actions, sentencing and plea bargains, and prisoner rights and inmate litigation.

10-504-175DE Correctional Security (3 cr.)
Teaches students the basics of correctional security. Topics include inmate security control, inspections, movements, counts, privacy and safety, contraband, and equipment and building security. Personal protection, hostage negotiations and pad subduing techniques will also be discussed.

10-504-176 CCI: Computer Crime Investigation (2 cr.)
Provides students with the skills, knowledge and ability to conduct computer crime investigations. Students will learn investigative protocols that can be applied to various types of computer crimes, focusing on the collection of evidence to initiate a criminal prosecution.

10-504-176DE CCI: Computer Crime Investigation (2 cr.)
Provides students with the skills, knowledge and ability to conduct computer crime investigations. Students will learn investigative protocols that can be applied to various types of computer crimes, focusing on the collection of evidence to initiate a criminal prosecution.

10-504-177 CCI: Computer Crime Law (3 cr.)
Provides students with an understanding of the nature and application of laws related to computer crime. Students will learn and apply state and federal laws regarding criminal violations, the search and seizure of electronic evidence, and presenting computer crime evidence in court.

10-504-178 CCI: Investigating Internet Crime (2 cr.)
Provides students with an understanding of the nature of crimes being committed on the Internet and the skills necessary to successfully investigate Internet-related crime. Students will learn various investigative techniques, protocols and technical tools necessary to identify offenders and acquire evidence to build a prosecutable case.

10-504-179 CCI: Basic Data Recovery (2 cr.)
Provides students with a basic understanding of how forensic evidence is recovered from a computer or similar device. Students will learn the necessary steps involved in preserving, authenticating, and analyzing data stored on computing devices, while maintaining the integrity of evidence found on these devices.
10-504-190DE Community Crime Prevention (1 cr.)
Instructs subject areas that are frequently requested by neighborhood watch, service club and related community groups. Topics include consumer fraud, identity theft, sexual assault prevention, Internet safety, auto theft and travel safety.

10-504-192DE Crime Prevention Planning (3 cr.)
Learn techniques to solve crime-related challenges in the community and create partnerships in crime prevention. Techniques for problem solving, engaging community members, building cohesiveness and dealing with diversity will be addressed.

10-504-193 Introduction to Digital Video Evidence (3 cr.)
Provides an in-depth analysis of how video works, including the uses and evidentiary value of digital video evidence. The latest freeware video analysis technologies will be explored in detail. Students will receive comprehensive information on freeware video imaging and analysis tools available for handling digital video evidence files from the field into the technician and analytical levels of analysis. Students will develop skills to recover reliable detail from their digital video evidence.

10-504-194 Forensic Anthropology, Intro to (3 cr.)
Provides the student with information regarding forensic anthropology as it applies to the science of physical anthropology and the legal process. Students will learn how forensic anthropologists apply standard scientific techniques developed in physical anthropology to identify human remains, and to assist in the detection of crime. Students will be exposed to how the forensic anthropologists assist in locating and recovering suspicious remains, establish if the bones are human, how to determine the sex, race, age, stature, weight, and any pathology of the newly acquired skeleton, determine manner and cause of death and, if homicide, identify the murderer.

10-504-195 Forensic Entomology, Intro to (3 cr.)
Provides the student with the applications and the study of insect and other arthropod biology to criminal matters. Defines how it is primarily associated with death investigations, how it can be used to detect drugs and poisons, determine the location of an incident, detect the length of a period of neglect in the elderly or children, and find the presence and time of the infliction of wounds. Students will be introduced to the structure and biology of insects and other similar creatures associated with entomology. Students will be led through standard death scene investigative procedures, the collection and field processing of entomological evidence, at the scene or at autopsy, and the lab processing and analysis of this evidence.

10-504-196 Quality Assurance, Evidence (3 cr.)
Provides an in-depth analysis of the quality assurance goals of agencies involved in all aspects crime scene evidence management activities to include law enforcement agencies, laboratories and related others. Students will be exposed to developing, maintaining and monitoring policies and procedures developed to produce the best quality standards and controls to accomplish an atmosphere with the highest quality of work. The course emphasizes validation of scientific methods prior to implementation, and delivering quality and safe services in a cost effective manner and provide directions for making decisions for services without compromising quality and safety.

10-504-900 Introduction to Criminal Justice (3 cr.)
Distinguish the roles of courts and law enforcement agencies; identify the role of law enforcement in American society; describe how professionalism and ethics relate to law enforcement; apply principles of critical thinking, decision-making, and problem solving; defend the importance of written agency policies; and distinguish between ministerial and discretionary duties.

10-504-901 Constitutional Law (3 cr.)
Diagram the structure of the criminal justice system; identify when constitutional rules apply; identify the elements of a lawful arrest; identify the requirements for search warrants, and when warrantless searches are permitted; identify the requirements governing confessions and statements; and analyze the requirements for evidence to be admissible in court.
10-504-902 Criminal Law (3 cr.)
Identify basic concepts of criminal law; analyze facts, circumstances, and situations and determine which crimes against persons have been committed; analyze facts, circumstances, and situations and determine which crimes against property have been committed; and analyze facts, circumstances, and situations and determine which crimes involving drugs, alcohol or other criminal activity have been committed.

10-504-903 Professional Communications (3 cr.)
Apply knowledge of the communication process, communication techniques, integrate verbal and physical intervention skills, develop strategies to obtain information in a variety of situations, differentiate between an interview and an interrogation, and analyze information for consideration as corroborative evidence.

10-504-904 Juvenile Law (3 cr.)
Describe the juvenile justice system; describe how juveniles in need of protection or services or delinquent are handled; identify constitutional law issues relevant to juveniles; analyze the role of law enforcement and other agencies in responding to and investigating child maltreatment; and recognize the unique investigative issues for missing children.

10-504-905 Report Writing (3 cr.)
Explain the context of report writing, take effective field notes, organize information in reports, write narratives, describe what information should be included in certain types of reports, prepare for court, describe how to be an effective witness, and testify as a witness in court.

10-504-906 Criminal Investigation Theory (3 cr.)
Describe the role of evidence in criminal investigations and prosecutions; locate and package evidence and document crime scenes; recognize the dynamics of victimization; apply appropriate interview techniques with adult or child victims; analyze the role of law enforcement in responding to domestic abuse; officer-involved domestic violence; and sexual abuse cases.

10-504-906DE Criminal Investigation Theory (3 cr.)
Describe the role of evidence in criminal investigations and prosecutions; locate and package evidence and document crime scenes; recognize the dynamics of victimization; apply appropriate interview techniques with adult or child victims; analyze the role of law enforcement in responding to domestic abuse; officer-involved domestic violence; and sexual abuse cases.

10-504-907 Community Policing Strategies (3 cr.)
Identify available community resources; explain the rewards and challenges of a diverse society; evaluate communication barriers with the public; respond to hate crimes; apply statutory requirements for emergency detentions and emergency protective placements of persons; apply crisis intervention principles and techniques; describe policing strategies; and apply principles of crime prevention.

10-504-908 Traffic Theory (3 cr.)
Enforce traffic laws; detect traffic violations; issue traffic citations; direct traffic; conduct an initial investigation at a crash scene; measure and document traffic crash scenes, including photographically; complete the Wisconsin Motor Vehicle Accident Report; take appropriate enforcement action based on information gathered; and recognize and interpret indicators of impaired driving.

30-504-330 Policing in America (1 cr.)
Learn the rules and procedures of the academy and how the various elements of the criminal justice system relate as well as the importance of professionalism. Explore the role of law enforcement officers play in a democracy and apply this knowledge in classroom exercises, including role-plays and other scenario-based training. Belief systems, social pressures, moral problems, decision-making and the consequences of decisions are discussed. Identify the resources available in communities to assist law enforcement officers. Discuss issues involved in policing in a diverse society and identify strategies for working effectively with a diverse community. Course covers Wisconsin requirements for written law enforcement agency policies and procedures.

30-504-331 The Legal Context (2 cr.)
Covers the structure of the criminal justice system, including criminal procedure. Learn the legal bases for law enforcement action such as arrest, use of force and search and seizure, as well as the limits on law enforcement activity. Learn the classifications of crimes and other violations including felonies, misdemeanors, and ordinance violations, and the elements of crimes listed in the criminal code. Laws and procedures that affect juveniles, including those related to taking a juvenile into custody, are discussed.
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30-504-332 Tactical Skills (3 cr.)
Learn the basis for and limits to use of force by Wisconsin officers including specific techniques for intervention covered in the Wisconsin system of Defense and Arrest Tactics. Learn the necessary weapons handling skills and how to care for and maintain their duty handguns. Learn to shoot quickly and accurately under a variety of conditions including under low light, while moving and from behind cover. Also learn the basics of room clearing, tactical movement, use of cover and concealment, and application to emergency situations.

30-504-333 Relational Skills (3 cr.)
Learn how to write a wide variety of law enforcement reports to accurately and fairly convey necessary information for use by investigators, prosecutors and the public. Explore the role of communication in law enforcement and develop and apply specific professional communication skills and strategies in a variety of simulated situations. The course covers principles, guidelines and techniques for proper law enforcement response to persons with possible mental disorders, alcohol or drug problems and/or developmental disabilities and the legal bases, requirements and practical guidelines for conducting emergency detentions and protective placements of persons. The basics of presenting effective court testimony also are discussed. Explore evolving police strategies, activities and attitudes that build effective law enforcement and community relationships, as well as problem-oriented policing strategies.

30-504-334 Patrol Procedures (4 cr.)
Become familiar with Wisconsin's traffic laws and ordinances, including those related to operator licensing and vehicle registration and equipment. Learn to enforce these laws, complete Wisconsin Uniform Traffic Citations and (as needed) to direct and control traffic effectively. Material covered includes steps taken as first-in officer to stabilize and manage a complex scene, investigate traffic accidents, take appropriate enforcement actions and prepare accident reports. Learn emergency vehicle operation including basic patrol operation, emergency vehicle response and pursuit driving. Understand the legal bases for making vehicle contacts, how to conduct a threat assessment and how to conduct different types of vehicle contact, including how to administer and interpret the Operating a Motor Vehicle While Intoxicated/Standardized Field Sobriety Test (OMVWI/SFST).

30-504-335 Investigations (2 cr.)
Provides techniques and procedures necessary to interview or interrogate adult and juvenile witnesses, suspects and victims. Learn how to recognize, process and preserve physical evidence and how to respond to crime victims. Explore the dynamics of victimization and victim's rights. Learn the statutory elements of each of the sensitive crimes and the dynamics, impacts and investigative strategies unique to these crimes.

506 Lab Science Tech

10-506-101 Beginning Laboratory Science (3 cr.)
Introduces the learner to beginning laboratory concepts and procedures. Emphasis will be on general laboratory safety, basic laboratory equipment utilization and calibration techniques. An introduction to scientific inquiry will be addressed. Proper techniques in documentation as it relates to quality control in verification of a quality system will be introduced. Concepts in data analysis will be reviewed as it relates to creation of a laboratory notebook.

10-506-103 Advanced Laboratory Science (3 cr.)
Gives the learner the opportunity to explore more complex laboratory procedures encountered in the environmental, medical, biotech, or forensic laboratory to include PCR, spectrophotometry and filtration as it relates to environmental microbiological and chemical analysis. The learner will conduct research, studies and experiments specific to their area of focus.

10-506-105 Environmental Lab Science Theory (2 cr.)
Learner will begin to apply scientific principles and information to the analysis of air, water and other environmental testing. The learner will learn principles to deal with biohazardous materials.

10-506-106 Environmental Lab Science Lab (1 cr.)
Learner will begin to apply laboratory procedures and the scientific method to the analysis of samples and the performance of simple experiments. Lab techniques: BOD, calibration, dissolved oxygen, dissolved solids, water testing, pathogen testing.

10-506-112 Paper and Packaging Testing Procedures (2 cr.)
Covers testing done in paper and packaging industries including basis weight, caliper, brightness, color, burst strength, tensile strength, stress, strain, modulus, elasticity/plasticity and poison behavior. Also introduces chemical testing, measurement techniques, data collection and safety procedures.
10-506-113 Instrumentation (2 cr.)
Focuses on the principles, use and care of laboratory instruments. Students will learn how various instruments are used to measure physical and chemical properties, and they will be introduced to calibration, maintenance and troubleshooting for various types of laboratory instruments.

10-506-121 Food Laboratory Science Theory (2 cr.)
Learn principles of laboratory work unique to food processing and food safety. HACCP and biosecurity principles will also be covered.

10-506-125 Food Laboratory Science Lab (1 cr.)
Perform experiments unique to food processing and food safety. Techniques currently used in the food industry to measure food characteristics or food properties will be done in the laboratory.

10-506-135 Lab Science Internship (3 cr.)
Integrates previous classroom study with specific off campus occupational experiences at selected training sites. An organized plan of experiences built around occupational competencies are planned, supervised and evaluated by the instructor and cooperating business trainer. Instructor consent required.

508 Dental

10-508-101 Dental Health Safety (1 cr.)
Prepares dental auxiliary students to respond proactively to dental emergencies, control infection, prevent disease, adhere to OSHA Standards, and safely manage hazardous materials. Students also take patient vital signs and collect patient medical/dental histories. CPR certification is a prerequisite; students will be required to show proof of certification before beginning the course. This course is aligned to serve students in the Dental Hygienist and Dental Assistant programs.

10-508-102 Oral Anatomy, Embry, Histology (4 cr.)
Prepares Dental Hygienist students to apply detailed knowledge about oral anatomy to planning, implementation, assessment and evaluation of patient care. Students identify distinguishing characteristics of normal and abnormal dental, head and neck anatomy and its relationship to tooth development, eruption and health.

10-508-103 Dental Radiography (2 cr.)
Prepares students to operate x-ray units and expose bitewing, periapical, extra oral, and occlusal radiographs. Emphasis is placed on protection against x-ray hazards. Students process, mount, and evaluate radiographs for diagnostic value. In this course students demonstrate competency on a manikin. In addition, students expose bitewing radiographs on a peer, role-play patient. This course is aligned to serve students in the Dental Hygienist and Dental Assistant programs.

10-508-105 Dental Hygiene Process 1 (4 cr.)
Introduces students to the basic technical/clinical skills required of practicing dental hygienists including use of basic dental equipment, examination of patients and procedures within the dental unit. Under direct supervision of an instructor, students integrate hands-on skills with entry-level critical thinking and problem-solving skills. Reinforces the application of dental safety skills.

10-508-106 Dental Hygiene Process 2 (4 cr.)
Builds on and expands the technical/clinical skills student began developing Dental Hygiene Process 1. Introduces the application of fluoride and desensitizing agents, whole mouth assessments, comprehensive periodontal examinations, application of sealants and patient classification. Students begin performing removal of supragingival stain, dental plaque, calcified accretions and deposits.

10-508-107 Dental Hygiene Ethics & Professionalism (1 cr.)
Helps student dental hygienists develop and apply high professional and ethical standards. Students apply the laws that govern the practice of dental hygiene to their work with patients, other members of a dental team and the community. Emphasis is placed on maintaining confidentiality and obtaining informed consent. Students enhance their ability to present a professional appearance.

10-508-108 Periodontology (3 cr.)
Prepares student to assess the periodontal health of patients, plan prevention and treatment of periodontal disease, and to evaluate the effectiveness of periodontal treatment plans. Emphasis is placed on the recognition of the signs and causes of periodontal disease and on selection of treatments modalities that minimize risk and restore periodontal health.

10-508-109 Cariology (1 cr.)
Focuses on the characteristics and contributing factors of dental decay. Dental Hygiene students help patients minimize caries risk by developing treatment plans, communicating methods to patients, and evaluating treatment results.
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**10-508-110 Nutrition and Dental Health (2 cr.)**
Prepares student dental hygienists to counsel patients about diet and its impact on oral health. Students learn to distinguish between balanced and unbalanced diets and to construct diets that meet the needs of patients with compromised dental/oral health. Students also learn to counsel patients about the effect of eating disorders on dental health.

**10-508-111 General & Oral Pathology (3 cr.)**
Prepares the student to determine when to consult, treat or refer clients with various disease, infection or physiological conditions. Students learn to recognize the signs, causes, and implications of common pathological conditions including inflammatory responses, immune disorders, genetic disorders, developmental disorders of tissues and cysts, oral tissue trauma, and neoplasm of the oral cavity.

**10-508-112 Dental Hygiene Process 3 (5 cr.)**
This clinical course builds on and expands the technical/clinical skills student dental hygienists developed in Dental Hygiene Process 2. In consultation with the instructor, students apply independent problem-solving skills in the course of providing comprehensive care for calculus case type 1, 2 and 3 patients and perio case type 0, I, II and III patients. Dental Hygiene Process 3 also introduces root detoxification using hand and ultra-sonic instruments, manipulation of files, use of oral irrigators, selection of dental implant prophylaxis treatment options and administration of chemotherapeutic agents. Students also adapt care plans in order to accommodate patients with special needs.

**10-508-113 Dental Materials (2 cr.)**
Prepares students to handle and prepare dental materials such as liners, bases, cements, amalgam, resin restorative materials, gypsum products, and impression materials. They also learn to take alginate impressions on manikins and clean removable appliances. This course is aligned to serve students in the Dental Hygienist and Dental Assistant programs.

**10-508-114 Dental Pharmacology (2 cr.)**
Prepares student dental hygienists to select safe and effective patient pre-medication, local anesthetic, chemotherapeutic and anti-microbial agents within the scope of dental hygiene practice. Students learn to recognize potential pharmacological contraindications for specific patients and to take measures to avoid negative impact or alert other members of the dental team to possible negative impact.

**10-508-115 Community Dental Health (2 cr.)**
Prepares the Dental Hygienist student to play a proactive role in improving the dental health of community members of all ages. Students perform and interpret dental health research to determine community dental health needs. They also participate in the development, implementation and evaluation of a community dental health program.

**10-508-116 Dental Pain Management (1 cr.)**
Prepares the student dental hygienist to work within the scope of dental hygiene practice to manage pain for dental patients. Students learn to prevent and manage common emergencies related to administration of local anesthesia, prepare the armamentarium, and administer local anesthesia. The course also addresses the recommendation of alternative pain control measures.

**10-508-117 Dental Hygiene Process 4 (4 cr.)**
Builds on and expands the technical/clinical skills developed in Dental Hygiene Process 3. With feedback from the instructor, students manage all aspects of cases in the course of providing comprehensive care for calculus case type 0, 1, 2 and 3 patients and for perio case type 0, I, II and III patients.

**10-508-119 Dental Hygiene National Board Review (2 cr.)**
Designed for Dental Hygienist graduates preparing for the Dental Hygiene National Board Examination. Students work independently and online, with access to material from fifteen courses which comprise the Dental Hygienist core curriculum. Usage is limited to school computer lab. Student must be a graduate or enrolled in the last semester of the Dental Hygienist program.

**10-508-120 Dental Office Management (2 cr.)**
Prepares dental auxiliary students to manage telephones, appointments, recall systems and inventory. Students also develop the skills needed to process accounts receivable and payable, collections, and third-party reimbursements. This course is aligned to serve students in the Dental Hygienist and Dental Assistant programs.

**10-508-130 Dental Hygiene, Transition into Practice (1 cr.)**
Prepares students for the written licensing and clinical practice examinations. It includes simulated, written and practical exams; an individualized study plan; stress/test anxiety management strategies; and dental hygiene licensing.

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10-508-149 Success Strategies for Dental Hygienists (2 cr.)
Provides students with the tools needed for success in the vital, realistic, and practical methods of critical thinking skills for dental hygienists. Decision making, problem solving, analysis of ideas, troubleshooting, creativity, setting goals and objectives are highlights of the course.

10-508-150 Dental Hygiene Independent Study (1 cr.)
Enables the dental hygiene students to select a topic of their choice and, with instructor approval and guidance, conduct advanced study of the topic.

31-508-302 Dental Chairside (5 cr.)
Prepares dental assistant students to chart oral cavity structures, dental pathology, and restorations and to assist a dentist with basic dental procedures including examinations, pain control, amalgam restoration, and cosmetic restoration. Students will also develop the ability to educate patients about preventive dentistry, brushing and flossing techniques, and dental procedures, using lay terminology. Throughout the course, students will apply decoding strategies to the correct use and interpretation of dental terminology.

31-508-304 Dental & General Anatomy (2 cr.)
Prepares dental assistant students to apply fundamentals of general and dental anatomy to informed decision-making and to professional communication with colleagues and patients.

31-508-306 Dental Assistant Clinical (3 cr.)
Emphasizes integration of core abilities and basic occupational skills. Students apply skills developed in Dental and General Anatomy, Dental Health Safety, Dental Chairside, Dental Materials, Dental Radiography and Dental Assistant Professionalism in a clinical setting with patients.

31-508-307 Dental Assistant Professional (1 cr.)
Prepares students for professional success in a dental practice or another dental health care environment. Students develop professional appearance and image. More importantly, they learn to work within ethical guidelines and legal frameworks. In preparation for entering the work force, dental assistants customize or develop their portfolios and lay out an on-going professional development plan.

31-508-308 Dental Chairside Advanced (5 cr.)
Prepares Dental Assistant students to adapt chairside skills to assisting with dental specialties as they are performed in general practice. Focuses on pediatric dentistry, orthodontics, oral maxillofacial surgery, endodontics, periodontics and prosthodontics. Students will also develop the ability to assist with sealants, perform coronal polishing, and apply topical fluoride and topical anesthetics.

31-508-309 Dental Laboratory Procedures (4 cr.)
Prepares Dental Assistant students to produce alginate impressions and fabricate diagnostic models, oral appliances, temporary restorations and custom trays. Students also polish oral appliances.

31-508-310 Dental Radiography - Advanced (1 cr.)
Builds on principles and skills developed in Dental Radiography. Dental Assistant students expose full mouth series, extra-oral and specialized radiographs on adult and child patients. Emphasis is on protection against X-ray hazards. Students will also process, mount and evaluate radiographs for diagnostic value. In addition, they will use radiographs to explain dental health and treatment plans to patients.

31-508-311 Dental Assistant Clinical-Adv (2 cr.)
Emphasizes integration of core abilities and basic and advanced occupational skills. Dental assistant students apply skills developed in Dental Chairside-Advanced, Dental Lab Procedures, Dental Radiography-Advanced and Dental Office Management in a clinical setting with patients.

509 Medical Assistant

10-509-102 Human Body in Health and Disease (3 cr.)
Focuses on diseases that are frequently first diagnosed and treated in the medical office setting. Students learn to recognize human anatomy and the causes, signs, and symptoms of diseases of the major body systems as well as the diagnostic procedures, usual treatment, prognosis and prevention of common diseases.

31-509-301 Medical Asst Admin Procedures (2 cr.)
Introduces medical assistant students to office management, business administration, and the electronic medical record (EMR) in the medical office. Students learn to schedule appointments, perform filing, record keeping, telephone and reception duties, communicate effectively with patients and other medical office staff, and keep an inventory of supplies.

31-509-303 Medical Asst Lab Procedures 1 (2 cr.)
Introduces medical assistant students to laboratory procedures commonly performed by medical assistants in a medical office setting. Students perform CLIA waived routine laboratory procedures commonly performed in the ambulatory care setting. Students follow laboratory safety requirements and federal regulations while performing specimen collection and processing, microbiology and urinalysis testing.
31-509-304 Medical Asst Clin Procedures 1 (4 cr.)
Introduces medical assistant students to clinical procedures performed in the medical office setting. Students perform basic examining room skills including screening, vital signs, patient history, minor surgery and patient preparation for routine and specialty exams in the ambulatory care setting.

31-509-305 Med Asst Lab Procedures 2 (2 cr.)
Prepares students to perform laboratory procedures commonly performed by medical assistants in the ambulatory care setting under the supervision of a physician. Students perform phlebotomy, immunology, hematology and chemistry laboratory procedures.

31-509-306 Med Asst Clin Procedures 2 (3 cr.)
Prepares medical assistant students to perform patient care skills in the medical office setting. Students perform clinical procedures including administering medications, performing an electrocardiogram, assisting with respiratory testing, educating patients/community, assisting with emergency preparedness in an ambulatory care setting.

31-509-307 Med Office Insurance & Finance (2 cr.)
Introduces medical assistant students to health insurance and finance in the medical office. Students perform bookkeeping procedures, apply managed care guidelines, and complete insurance claim forms. Students use medical coding and managed care terminology to perform insurance-related duties.

31-509-309 Medical Law, Ethics & Professionalism (2 cr.)
Prepares students to display professionalism and perform within ethical and legal boundaries in the health care setting. Students maintain confidentiality, examine legal aspects of the medical record, perform risk management procedures, and examine legal and bioethical issues.

31-509-310 Medical Assistant Practicum (3 cr.)
Requires medical assistant students to integrate and apply knowledge and skills from all previous medical assistant courses in actual ambulatory health care settings. Learners perform medical assistant administrative, clinical, and laboratory duties under the supervision of trained mentors to effectively transition to the role of a medical assistant. This is a supervised, unpaid, clinical experience. AAMA required Practicum - 160 minimum hours (AAMA minimum) up to 216 hours.

510 Personal Care Worker

10-510-116 People Skills for Health Professionals (1 cr.)
Explores professional/social interaction skills required for healthcare workers. Investigates values, ethical dilemmas, helping roles, assertiveness skills, communications with special populations, death/dying issues and stress management interventions. Participate in reflective self-study group discussions and service learning experiences. Develop a professional portfolio for future employment use.

31-510-302 Body Structure and Function (2 cr.)
Introduces the basic normal anatomy and physiology of the human body essential for nursing practice. Medical terminology is introduced and plays a significant role in the course. Medical Terminology (10-501-101) is recommended but not required.

514 Occupational Therapy Assistant

10-514-171 Introduction to Occupational Therapy (3 cr.)
Provides an overview of history, philosophy, ethics and scope of occupational therapy practice. Examines legal responsibilities, professional resources and organization. Students practice basic skills related to therapeutic relationships and determine their own suitability to a career in occupational therapy.

10-514-172 Medical and Psychosocial Conditions (3 cr.)
Introduces medical and psychosocial conditions as they relate to occupational therapy practice. Topics include etiology, symptomology, treatment and contraindications.

10-514-173 Activity Analysis and Applications (2 cr.)
Provides instruction in activity analysis with hands-on experience in activities across the lifespan. Students apply the teaching/learning process and adhere to safety regulations.

10-514-174 OT Performance Skills (4 cr.)
Emphasis on the development of skills related to assessment and intervention in the areas of sensory, motor, cognition and communication.

10-514-175 Psychosocial Practice (3 cr.)
Examines the role of the OT in the service delivery to individuals affected by mental health conditions. Provides opportunity for development of skills related to the assessment and interventions of psychosocial needs.

10-514-176 OT Theory and Practice (3 cr.)
Examines the theoretical foundations that guide OT practice. Apply group dynamics and demonstrate leadership skills.
10-514-177 Assistive Technology and Adaptations (2 cr.)
Explores technologies that support delivery of OT services. Emphasis on competency related to computer skills, ergonomics, adaptive devices and environments.

10-514-178 Geriatric Practice (3 cr.)
Examines the role of the OT in the service delivery to elders in a variety of settings. Includes analysis of the impact of age-related changes and disease processes on the function of the elderly.

10-514-179 Community Practice (2 cr.)
Explores practice options and interventions for occupation-based community practice. Students articulate the unique role of occupational therapy within the community.

10-514-182 Physical Rehabilitation Practice (3 cr.)
Explores interventions relative to major physical disability diagnoses seen in OT practice. Evaluation, treatment interventions and documentation are emphasized relative to the biomechanical, neurodevelopmental and rehabilitative approaches to practice.

10-514-183 Pediatric Practice (3 cr.)
Explores interventions relative to major pediatric diagnoses seen in OT practice. Evaluation, treatment interventions and documentation are emphasized within the context of the child's occupations.

10-514-184 OTA Fieldwork I (2 cr.)
Integrate classroom theory and practice into a Fieldwork Level 1 experience. Provides experiences to assist in the development of communication, professional and observational skills.

10-514-184A OTA Fieldwork I - Part A (1 cr.)
Integrate classroom theory and practice into a Fieldwork Level 1 experience. Provides experiences to assist in the development of communication, professional and observational skills.

10-514-184B OTA Fieldwork I - Part B (1 cr.)
Integrate classroom theory and practice into a Fieldwork Level 1 experience. Provides experiences to assist in the development of communication, professional and observational skills.

10-514-185 OTA Practice and Management (2 cr.)
Provides opportunities to practice clinical management skills, continuous quality improvement measurement, and administrative concepts and procedures. Students create a professional development plan.

10-514-186 OTA Fieldwork II A (5 cr.)
Develop skills and behaviors necessary for entry-level occupational therapy assistant practice. Provides a different clinical practice setting than OTA Fieldwork II B.

10-514-187 OTA Fieldwork II B (5 cr.)
Develop skills and behaviors necessary for entry-level occupational therapy assistant practice. Provides a different clinical practice setting than OTA Fieldwork II A.

520 Social Services

10-520-100 Human Assertiveness (1 cr.)
Assists individuals to cope effectively with the conflicts experienced in daily living. Topics include fight/flight assertiveness, human rights, manipulation, assertive persistence, authority situations, equal relationships, social assertiveness, and work effectiveness and assertiveness.

10-520-103 Stress Management (1 cr.)
Focuses on the awareness of stress and how people respond to stress physically, emotionally and intellectually. Lifestyle stressors and prevention strategies are identified. Participants design a personal plan to assist in their stress-coping skills.

10-520-105 Personal/Professional Development (1 cr.)
Introduces personal and professional characteristics and qualities expected of a person in the helping professions. Students clarify personal beliefs, values and principles and assess their strengths and weaknesses. They examine how the principles of interdependent cooperation impact them personally and professionally.

10-520-110 AODA Sexual and Physical Abuse Issues (1 cr.)
Examines the emotional, intellectual and physical aspect of individuals affected by sexual and physical abuse. Both the short- and long-term implications of this abuse and the role that drugs and alcohol play in compounding the issues related to effective treatment are emphasized.

10-520-111 AODA Relapse Prevention (1 cr.)
Covers relapse dynamics, the types and process of relapse, and how to treat those in relapse. The warning signs and how to assess the risk factors associated with relapse are discussed. Emphasizes recovery factors, interrupting the relapse process, and the wanting vs. craving factors for alcohol.

10-520-160 Health and Aging (1 cr.)
Provides an overview of wellness, exercise, sexuality, spirituality and nutrition as they relate to health and aging.
10-520-161 Physical Aspects of Aging (1 cr.)
Focuses on understanding the physical aspects of the aging process that are associated with elderly populations. Topics include hearing loss, visual impairments, mobility issues and specific diseases such as Parkinson’s disease, stroke, arthritis and diabetes.

10-520-162 Psychosocial Issues and Aging (2 cr.)
Examines the factors and relationships that affect the older adult. Participants explore a variety of topics such as Alzheimer’s, depression and dealing with losses. It also covers elder abuse and drug and alcohol concerns.

10-520-163 Public Policy and Aging (1 cr.)
Introduces such concepts as elder law, advanced directives and funding sources including Medicare and Social Security. Students review federal, state and professional rights and responsibilities associated with working with an elderly population.

10-520-164 Community Resources for the Elderly (1 cr.)
Explores available community options and partnerships that serve the aging population. Access to transportation, housing, work and leisure activities is included.

10-520-165 Prevention/Safety Concerns for the Elderly (1 cr.)
Introduces environmental concerns such as protection from fire, prevention of falls, and medical concerns such as medication management and care provider issues. This is designed for people who are addressing the safety concerns of older adults.

530 Health Information

10-530-160 Healthcare Informatics (4 cr.)
Emphasizes the role of information technology in healthcare through an investigation of the electronic health record (EHR), business and health information software applications. Learners will develop skills to assist in information systems design and implementation.

10-530-161 Health Quality Management (3 cr.)
Explores the programs and processes used to manage and improve healthcare quality. Addresses regulatory requirements as related to performance measurement, assessment, and improvement, required monitoring activities, risk management and patient safety, utilization management, and medical staff credentialing. Emphasizes the use of critical thinking and data analysis skills in the management and reporting of data.

10-530-167 Health Data Management (2 cr.)
Introduces the use and structure of health care data elements, data sets, data standards, their relationships to primary and secondary record systems and health information processing.

10-530-166 Healthcare Statistics & Research (2 cr.)
Explores the management of medical data for statistical purposes. Focuses on descriptive statistics, including definitions, collection, calculation, compilation and display of numerical data. Vital statistics, registries and research are examined.

10-530-168 Healthcare Law & Ethics (2 cr.)
Examines regulations for the content, use, confidentiality, disclosure and retention of health information. An overview of the legal system and ethical issues are addressed.

10-530-169 Introduction to the Health Record (1 cr.)
Prepares learners to illustrate the flow of health information in various health care delivery systems and within the health information department. Prepares learners to retrieve data from health records. Professional ethics, confidentiality and security of information are emphasized.

10-530-170 Human Disease for the Health Professions (3 cr.)
Prepares learners to interpret clinical documentation that they will encounter in a variety of healthcare settings. Emphasis is placed on understanding the common disorders and diseases of each body system to include the etiology (cause), signs and symptoms, diagnostic tests and results, and medical treatments and surgical procedures.

10-530-171 CPT Coding (3 cr.)
Prepares learners to assign CPT codes, supported by medical documentation, with entry level proficiency. Learners apply CPT instructional notations, conventions, rules, and official coding guidelines when assigning CPT codes to case studies and actual medical record documentation.

10-530-172 Healthcare Reimbursement (2 cr.)
Prepares learners to compare and contrast health care payers, illustrate the reimbursement cycle, and to comply with regulations related to fraud and abuse. Learners assign Diagnosis Related Groups (DRGs), Ambulatory Payment Classifications (APCs) and Resource Utilization Groups (RUGs) with entry-level proficiency using computerized encoding and grouping software.

10-530-173 HIM Organizational Resources (2 cr.)
Examines the principles of management to include planning, organizing, human resource management, directing, and controlling as related to the health information department.
10-530-195 Applied Coding (2 cr.)
Prepares students to assign ICD and CPT/HCPCS codes supported by medical documentation with intermediate level of proficiency. Students will prepare appropriate physician queries in accordance with compliance guidelines and will assign codes to optimize appropriate reimbursement.

10-530-196 Professional Practice 1 (3 cr.)
Applies previously acquired skills and knowledge by means of clinical experiences in the technical procedures of health record systems and discussion of clinical situations. This is the first of a two-semester sequence of supervised clinical experiences in health care facilities.

10-530-197 ICD Diagnosis Coding (3 cr.)
Prepares students to assign ICD diagnosis codes supported by medical documentation with entry level proficiency. Students apply instructional notations, conventions, rules, and official coding guidelines when assigning ICD diagnosis codes to case studies and actual medical record documentation.

10-530-198 Professional Practice 2 (3 cr.)
Applies previously acquired skills and knowledge and discussion of clinical situations. Prepares for the certification examination and pre-graduation activities. This is the second of a two-semester sequence of supervised technical and managerial clinical experiences in health care facilities.

10-530-199 ICD Procedure Coding (2 cr.)
Prepares students to assign ICD procedure codes supported by medical documentation with entry level proficiency. Students apply instructional notations, conventions, rules and official coding guidelines when assigning ICD procedure codes to case studies and actual medical documentation.

531 Emergency Medical Service

10-531-101 First Aid/CPR, Principles and Practices (1 cr.)
Prepares and evaluates basic first aid skills necessary to care for the ill and injured until medical help arrives. Covers the use of an Automated External Defibrillator (AED), as well as CPR for all ages and the recognition and care of cardiac emergencies. Students receive an AHA Healthcare CPR card and a FVTC First Aid certificate upon course completion.

10-531-101B 1st Aid/CPR-Principle & Practice-Wood Tech (1 cr.)
Prepares and evaluates basic first aid skills necessary to care for the ill and injured until medical help arrives. Covers the use of an Automated External Defibrillator (AED), as well as CPR for all ages and the recognition and care of cardiac emergencies. Students receive an AHA Heartsaver CPR card and a FVTC First Aid certificate upon course completion.

10-531-102 Emergency Medical Technician - Basic (3 cr.)
Prepares and evaluates the knowledge and skills needed by ambulance personnel to respond to and treat cardiac arrest and critical medical and trauma situations. Extrication and ambulance operations are also covered. Department consent required.

10-531-104 Emergency Medical Responder (2 cr.)
Teaches and evaluates the knowledge/skills needed to respond to medical or trauma situations. It includes AED, Combitube, Epi-Pen, Spinal Immobilization, CPR and skills needed to assist the ambulance crew. This course meets Wisconsin and National licensure guidelines. Students receive an AHA Healthcare CPR card and FVTC Emergency Medical Responder certificate.

10-531-151 Paramedic Fundamentals (5 cr.)
Provides basic knowledge of the EMS system, roles and responsibilities, well-being of the paramedic, illness and injury prevention, medical/legal aspects, ethics, general principles, pathophysiology, therapeutic communication, history taking, physical exam techniques, patient assessment, clinical decision making, verbal communication and documentation. The student will gain an understanding of the basic principles of shock management.

10-531-152 Paramedic Pharmacology (4 cr.)
Provides the opportunity for the student to develop knowledge of basic pharmacodynamics. The student will gain the knowledge and skills required to safely and precisely access the venous circulation, and to select, prepare and administer appropriate medications used in the treatment of disorders of the major body systems.

10-531-155 Respiratory Management (2 cr.)
Provides the student with the knowledge and skills to establish and/or maintain a patent airway, oxygenate and ventilate a patient.
10-531-156 Cardiology I (3 cr.)
Provides the student with the basic knowledge and skills to integrate pathophysiological principles and assessment findings, with ECG interpretation, in order to formulate a field impression and implement the treatment for the patient with cardiovascular disease.

10-531-157 Clinical I - EMT/Paramedic (4 cr.)
Requires the student to complete 288 hours of documented practical skills application and observation at the beginning EMT-Paramedic level. The student will perform required skill competencies at a variety of clinical and field internship sites under the direct supervision of an approved preceptor.

10-531-158 Cardiology II (3 cr.)
Provides the student with the knowledge and skills to integrate a field impression and implement a treatment plan for a patient with Acute Coronary Syndromes (ACS) and includes Advanced Cardiac Life Support Certification. The student will gain an understanding of basic 12 lead ECG interpretation as it applies to the treatment for a patient with ACS.

10-531-159 Medical Emergencies (3 cr.)
Provides the student with the knowledge and skills to integrate pathophysiological principles and assessment findings to formulate a field impression and implement a treatment plan for patients experiencing neurology, endocrine, allergic or anaphylactic emergencies, gastroenterology, renal/urology, toxicology, hematology, environmental emergencies, infectious and communicable diseases, and behavioral and psychiatric disorders.

10-531-164 Trauma (3 cr.)
Provides the student with the knowledge and skills to integrate the principles of kinematics to enhance the patient assessment and predict the likelihood of injuries based on the patient’s mechanism of injury. This course includes the following traumas: soft tissue, burns, head and facial, spinal, abdominal, thoracic and mechanism of injury trauma systems. Course includes PHTLS Certification.

10-531-165 Emergency Care for Specialists (3 cr.)
Provides the knowledge and skills to formulate a field impression and implement a treatment management plan for the patient experiencing a gynecology, obstetrical, neonatal, pediatric or geriatric emergency. Includes victim of abuse or assault, patients with special challenges, acute interventions in the home care patient and life span development. Pediatric Advanced Life Support (PALS) and Neonatal (NALS) Certification.

10-531-166 EMS Operations (3 cr.)
Includes ambulance operations, medical incident command, rescue awareness, weapons of mass destruction, assessment based management and NREMT-P prep.

10-531-167 Clinical II - EMT/Paramedic (3 cr.)
Requires the student to complete 216 hours of documented practical skills application and observation at the beginning EMT-Paramedic level. The student will perform required skill competencies at a variety of clinical and field internship sites under the direct supervision of an approved preceptor.

10-531-168 Basic Electrocardiogram Interpretation (1 cr.)
Provides learner with a general understanding of the heart and some of the dysrhythmias associated with cardiac problems. Explores topics as cardiac anatomy and physiology, electrophysiology of cardiac cells, an introduction to electrocardiograms, basic cardiac rhythms and dysrhythmias, treatment protocols and cardiac drugs. Provides a basic introduction for registered nurses, paramedics, respiratory therapists and other health professionals who will care for patients with dysrhythmias.

30-531-306 Intermediate Technician (2 cr.)
Teaches and evaluates the licensed EMT’s knowledge and advanced skills including IV therapy, Subq., injections and pharmacology. This course meets state Intermediate Technician licensure requirements. Students must have a current Wisconsin EMT-Basic license, updated immunizations, current AHA BLS CPR and criminal background checks. Department consent is required to register.

30-531-331 Law Enforcement Emergency Response (1 cr.)
Learn how to perform an initial medical assessment for injury or medical condition, how to provide immediate treatment for a variety of injuries and conditions, and how to perform CPR and use an automatic emergency defibrillator.

31-531-301 First Aid/CPR (1 cr.)
Presents and evaluates basic first aid skills necessary to care for the ill/injured until medical help arrives. Covers use of Automated External Defibrillator (AED) and CPR for all ages. Students receive an AHA Heartsaver CPR card and an FVTC First Aid certificate upon course completion.

536 Pharmacy
10-536-110 Pharmaceutical Calculations (3 cr.)
Prepares the learner to enlarge and reduce formulas and solve proportions, dilutions, allegations, and other calculations pertinent to the preparation of pharmaceuticals using metric, apothecary, avoirdupois and household measuring systems.
10-536-112 Pharmacy Business Applications (4 cr.)
Prepares the learner to utilize pharmaceutical business terminology, procedures, customer service, record keeping, purchasing procedures, inventory control systems, pricing, merchandising, reference materials, ethics, roles, responsibilities, and relationships with patients and coworkers.

10-536-115 Pharmacy Law (2 cr.)
Introduces the learner to federal and state regulations that apply to pharmacy practice.

10-536-120 Fundamentals of Reading Prescriptions (1 cr.)
Prepares the learner to work in a community or hospital pharmacy by exploring the role of a pharmacy technician within the healthcare team; examining each step in the prescription filling process; and identifying the top 200 drugs by brand and generic name and therapeutic class.

10-536-122 Pharmacology (3 cr.)
Enhances the learner’s ability to act and react appropriately in the pharmacy by learning how drugs work through examination of the anatomy, physiology, pathophysiology, and drug therapy for each of the major systems.

10-536-124 Pharmacy Drug Distribution Systems (1 cr.)
Is an introductory level laboratory study of the unit-dose medication dispensing systems and institutional pharmacy practice. Emphasis is on exposure to and accuracy in performing the activities of a pharmacy technician in an institutional setting.

10-536-126 Pharmacy Parenteral Admixtures (3 cr.)
Provides the learner with the skills to utilize aseptic technique in vertical and horizontal laminar flow hoods for preparation of solutions and medications to be administered intravenously, intramuscularly, subcutaneously, and intradermally to patients.

10-536-134 Pharmacy Benefits - Managing (3 cr.)
Introduces the learner to the concept of third-party payment for prescriptions.

10-536-138 Pharmacy Community Clinical (2 cr.)
Provides hands-on experience in a community pharmacy for 108 hours during quarter two. Areas of instruction include interpretation of prescriptions, entering prescriptions on computer, patient profiles, correctly filling and labeling prescriptions, billing patient and third parties, customer service, over-the-counter medications, purchasing, checking in deliveries, and inventory control, compounding and patient confidentiality.

10-536-140 Pharmacy Hospital Clinical (3 cr.)
Provides the learner with the skills to prepare parenteral admixtures, fill medication carts and unit-dose drawers, control inventory, package medications, and maintain patient records in the hospital setting.

10-536-141 Hospital Clinical Lab (2 cr.)
Provides the learner with the skills to utilize aseptic technique in vertical and horizontal laminar flow hoods for preparation of solutions and medications to be administered intravenously, intramuscularly, subcutaneously, and intradermally to patients and provides experience with institutional drug delivery systems including the unit-dose system. Completion of Pharmacy Community Clinical is required. Completion of or concurrent enrollment in Pharmacy Hospital Clinical, Pharmacy Parenteral Admixtures and Pharmacy Drug Distribution Systems is also required.

543 Nursing-Assoc Degree/Practical

30-543-300 Nursing Assistant (3 cr.)
Prepares learners for entry-level employment as assistants to a licensed nurse in a hospital, nursing home, home health agency or community-based residential facility. Covers simple nursing tasks such as bathing and feeding patients, making beds and taking vital signs.

31-543-309 Body Structure and Function (2 cr.)
Introduces the basic normal anatomy and physiology of the human body essential for nursing practice. Medical terminology is introduced and plays a significant role in the course. Medical Terminology (10-501-101) is recommended but not required.

47-543-402 LPN Refresher-Skills & Theory Review (4 cr.)
Provides the LPN refresher student time to practice and refresh on basic nursing skills utilized. An independent theory review will include the nursing process, infection control, medication update, recent trends, the aging population, communication, documentation and reporting, and scope of practice. A valid Wisconsin LPN license or temporary permit for educational purposes; current CPR for licensed professional which must remain current until completion of the course; health requirement must be met; copy of caregiver background check required.
47-543-403 LPN Refresher-Precepted Clinical (3 cr.)
LPN refresher students will complete 108 hours of precepted clinical experience. Students must complete 47-543-402 prior to starting this course. A valid Wisconsin LPN license or temporary permit for educational purposes; current CPR for licensed professional which must remain current until completion of the course; health requirement must be met; and a copy of caregiver background check required.

47-543-404 RN Refresher-Skills & Theory Review (4 cr.)
Provides the RN refresher student time to practice and refresh on basic nursing skills utilized. An independent theory review will include the nursing process, infection control, medication update, recent trends, the aging population, communication, documentation and reporting, and scope of practice. A valid Wisconsin RN license or temporary permit for educational purposes; current CPR for licensed professional which must remain current until completion of the course; health requirement must be met and a copy of caregiver background check required.

47-543-405 RN Refresher-Precepted Clinical (3 cr.)
RN refresher students will complete 108 hours of precepted clinical experience. Students must complete 47-543-404 prior to starting this course. A valid Wisconsin RN license or temporary permit for educational purposes; current CPR for licensed professional which must remain current until completion of the course; health requirement must be met and a copy of caregiver background check required.

545 Developmental Disabilities Services
10-545-116 Deaf, Communicating with (3 cr.)
Provides a foundation in sign language skills to facilitate communication with the deaf and hard of hearing. Pertinent issues are discussed to broaden an understanding of the deaf culture.

550 Alcohol & Other Drug Abuse Services
10-550-100 Substance Abuse Services, Overview of (2 cr.)
Provides an overall picture of substance abuse services. Topics include the continuum of care, modalities of treatment, referral and assessment services, and federal, state and local agencies. A historical perspective on alcohol and drug use and prevention is also provided.

10-550-101 Alcohol and Drugs, Risk Reduction (1 cr.)
Provides a comprehensive, systematic approach to reduce the risk of people of any age developing problems related to alcohol and drug abuse. The health, social, legal, occupational and family problems that result from alcohol and drug abuse are examined.

10-550-106 Understanding Addiction (3 cr.)
Explores the physical, psychological and sociocultural dynamics of addiction. Treatment theories, screening criteria, environmental considerations, related complications, perinatal concerns and nontraditional alternatives are introduced.

10-550-109 Clients' Rights and Clinical Ethics (2 cr.)
Explores the statutes, regulations and judicial decisions that govern the professional practice of alcohol and drug counseling. Standards, code of ethics, clients' rights and confidentiality are emphasized.

10-550-118 Psychopharmacology (3 cr.)
Provides a historical and cultural perspective on alcohol and drug use and abuse, and abuse preventions. It incorporates an overview of drugs including their actions, effects, abuse, and psychopharmacology.

10-550-120 Assessment and Diagnosis of Substance Abuse (4 cr.)
Provides skills needed to prepare a focused, well-organized client interview. Enables participants to collect information needed to develop and formulate a psychosocial and treatment plan. Various types and uses of diagnostic instruments are addressed. Topics also include differential diagnoses.

10-550-125 Counseling Skills and Practices, Basic (2 cr.)
Prepares students to use the counseling techniques of attending, paraphrasing, reflecting, summarizing, probing, self-disclosure, interpreting and confrontation.

10-550-126 Counseling Theory 1 (2 cr.)
Explores four theories of psychotherapy: psychoanalytic, Adlerian, existential and person-centered. Presents a basic understanding of each theory's philosophy, concepts, therapy goals and techniques, as well as their historical impact on psychotherapy and AODA counseling.
10-550-130 Counseling Theory 2 (2 cr.)
Introduces the psychotherapy theories of gestalt, reality therapy, behavior therapy, cognitive-behavior therapy and transactional analysis. Presents a basic understanding of each theory’s philosophy, concepts, therapy goals and techniques as well as their historical impact on psychotherapy and AODA counseling.

10-550-132 Counseling Skills Lab (1 cr.)
Prepares learners for their internship experience. Students practice assessment and counseling skills and develop personal and clinical evaluation techniques. Students also identify the counseling theories and techniques they use in their clinical practice sessions.

10-550-134 Mental Disorders, Overview of (3 cr.)
Provides an overview to the diagnosis and treatment strategies of mental disorders. Focus is on understanding the mental disorders that co-exist with substance disorders. Examines individual and family crisis intervention processes.

10-550-136 AODA Case and Records Management (2 cr.)
Introduces the health care system and discusses continuous improvement concepts and the information systems and documentation requirements of clinical agencies. The client case management model is emphasized.

10-550-137 Pre-Internship Seminar (1 cr.)
Prepares the learner for the internship experience. Students develop resumes and participate in mock interviews. This course reviews AODA counseling core functions and record keeping practices.

10-550-138 Cross-Cultural Counseling (3 cr.)
Provides specific treatment alternatives for a variety of clients and their effectiveness. Develops the skills to value and understand the context and world views of people different from themselves. Categories of diverse populations discussed include gender, minority/ethnic cultures, gay and lesbian clients, differently abled clients, and clients in the criminal justice system.

10-550-139 AODA Advanced Internship (2 cr.)
Provides the learner with the opportunity to assume greater responsibility and more of the duties of a substance abuse counselor in actual clinical practice. The course provides the learner with opportunities to strengthen skills and to experience the full range of responsibilities assumed by an AODA counselor while being supervised by an experienced substance abuse professional.

10-550-141 Group Facilitation (2 cr.)
Provides an experiential and participatory setting to develop the skills and principles necessary for facilitating a group. Basic issues in group work, group practice in specific groups, and stages of development in group process will be emphasized.

10-550-149 AODA Independent Study (1 cr.)
Provides the learner with the opportunity to research and develop an addictions study area of special interest. Objectives are mutually developed by the student and the instructor.

10-550-150 Family Systems and AODA (2 cr.)
Looks at the effects of substance abuse on the family. A multigenerational family systems approach is used, which includes an examination of how each family member develops his/her coping mechanisms. Students consider the issues of codependency, adult children of alcoholic parents and the dynamics of family intervention.

10-550-160 AODA Internship (4 cr.)
An on-site experience during which the learner is oriented to the environment of substance abuse treatment. Supervised practice in the 12 core functions of counseling including assessment, group and individual counseling, case management, and consultation is offered.

10-550-161 AODA Internship Seminar (1 cr.)
Provides case study presentations, discussions of current issues and research in AODA and planning for continued professional development and certification.

602 Automotive Technology

10-602-103 Engine Repair 1 (2 cr.)
Focuses on developing the skills needed to diagnose, service and repair internal combustion engines. Emphasis is placed on in-vehicle repairs including engine cooling and lubrication systems.

10-602-104 Brake Systems (3 cr.)
Focuses on developing the skills needed to diagnose, service and repair vehicle braking systems with an introduction to ABS. (ABS diagnosis, service and repair will be addressed in the Advanced Chassis course.)

10-602-106 Automotive Internship (2 cr.)
This course will provide students with work experience on actual vehicles in area shops.
Course Descriptions

**10-602-107 Automotive Service Fundamentals (2 cr.)**
Focuses on developing skills in professionalism, safety, and the use of basic and power tools in accordance with industry standards. Students are introduced to the automotive service industry and learn to use both comprehensive and manufacturer’s service information to perform basic under-hood and under-car services.

**10-602-109 Automatic Transmission/Transaxle (4 cr.)**
Focuses on developing the skills needed to diagnose, service, and repair automatic transmissions/transaxles including overhaul procedures.

**10-602-112 Global Automotive Market (1 cr.)**
Provides the opportunity for the learner to develop the knowledge and understanding of Automobiles that are sold worldwide. Study similar/differences in regards to state regulation as well as the EPA rulings. Learner will also develop a mindset of service and diagnostic procedures that are used in specific areas and ones that are used worldwide. The learner will have electronic assignments pertaining to the subject matter on line using service called Blackboard.

**10-602-115 Electrical 1 - ASEP (3 cr.)**
Designed to provide the ASEP student with basic knowledge of automotive electrical applications. Including basic electrical theory, meters, servicing and repair of General Motors starting and charging systems. Students will also learn to use test equipment for the starting and charging systems diagnosis.

**10-602-116 Electrical 2 - ASEP (3 cr.)**
Is designed to provide the ASEP student with the knowledge of automotive electrical applications. General Motors electrical components, terminology, controls and operation of the basic computer controlled devices are emphasized.

**10-602-120 Fuel Systems - ASEP (3 cr.)**
Focuses on the entire General Motors fuel system, including fuel tanks, gauges, fuel pump modules and fuel injection. It also will cover the operation of all fuel-related components and their operation as it relates to fuel delivery and emission systems.

**10-602-122 Driveline/Manual Transmission - ASEP (3 cr.)**
Designed to give an ASEP student the basic knowledge and skills needed to service General Motors manual transmissions, drivelines, differentials and axles. The ASEP student receives hands-on practice in the repair of these units.

**10-602-123 Engine Repair 2 (3 cr.)**
Focuses on developing the skills needed to diagnose, service, and repair internal combustion engines. Emphasis is placed on out-of-vehicle engine repair including overhaul procedures.

**10-602-124 Steering & Suspension Systems (3 cr.)**
Focuses on developing the skills needed to diagnose, service and repair steering and suspension systems including wheel alignment procedures.

**10-602-125 Electrical & Electronic Systems 1 (2 cr.)**
Focuses on developing the skills needed to diagnose, service and repair electrical and electronic systems. Learners apply Ohm’s Law to basic electrical circuit diagnosis.

**10-602-127 Electrical & Electronic Systems 2 (3 cr.)**
Focuses on developing the skills needed to diagnose, service, and repair electrical and electronic systems, including batteries, starting, charging, and lighting systems, and computer control systems.

**10-602-128 Electrical & Electronic Systems 3 (3 cr.)**
Focuses on developing the skills needed to diagnose, service, and repair electrical and electronic systems, including driver information, horn, wiper/washer, power accessories, cruise control, air bag, anti-theft, and radio systems.

**10-602-134 Automotive Engines Measuring - ASEP (3 cr.)**
Focuses on General Motors automotive engine design and construction. All engine parts such as pistons, connecting rods, camshafts and crank shafts are studied and measured in a lab setting. The use of micrometers, plastic gauge and other measuring equipment will be demonstrated and then used by the student.

**10-602-135 Dealership Co-op 2 - ASEP (2 cr.)**
Emphasizes a period of involved employment at a General Motors Dealership carried out through an organized student learning plan. Its purpose is to allow students to gain meaningful occupational experience in the automotive field.

**10-602-137 Dealership Co-op 3 - ASEP (2 cr.)**
Emphasizes a period of involved employment at a General Motors Dealership carried out through an organized student learning plan. Its purpose is to allow students to gain meaningful occupational experience in the automotive field.

**10-602-139 Dealership Co-op 4 - ASEP (2 cr.)**
Emphasizes a period of involved employment at a General Motors Dealership carried out through an organized student learning plan. Its purpose is to allow students to gain meaningful occupational experience in the automotive field.
10-602-141 Dealership Co-op 1 - ASEP (2 cr.)
Provides a period of employment at a General Motors dealership that follows a student learning plan. It is designed to give students occupational experience in the automotive field.

10-602-149 Manual Drive Train and Axles (4 cr.)
Focuses on developing the skills needed to diagnose, service, and repair clutches, manual transmissions/transaxle, differentials, four wheel drive/all wheel drive, and drive axles.

10-602-150 Automotive Internship-ASEP/Co-op (3 cr.)
Provides ASEP & Co-op students with work experience on actual customer vehicles in their sponsoring dealership or worksite.

10-602-152 Automotive Service Consulting (3 cr.)
Examines the responsibilities and procedures associated with the multi-faceted role of an automotive service consultant. It provides an understanding of how service techniques are used to maximize customer satisfaction and profitability. Content follows guidelines established by ASE for Automotive Service Consultant (C1) certification, and integration with Oral/Interpersonal Comm reinforces the students' communication skills.

10-602-153 Automotive Service Management (3 cr.)
Explores the duties and practices assigned to service managers in the successful operation of an automotive service facility. The success of any organization most often depends on the execution and management of such strategic issues as business development, personnel and fiscal operations. Integration with Psychology of Human Relations (10-809-199) provides a unique perspective on the personnel processes from recruitment of employees to supervision and performance assessment.

10-602-160 Welding for Automotive Technology (1 cr.)
Focuses on developing skills in welding and cutting used in automotive mechanical repair facilities. Methods of welding and cutting include oxy-fuel and gas metal arc welding (MIG). Students will learn to set up equipment and weld in various positions using a variety of materials typically found in automotive technologies.

10-602-161 Engines Machining 1 (1 cr.)
Focuses on developing fundamental skills used in rebuilding automotive engines. An emphasis is placed on an introduction to the theory and operation of equipment used in refurbishing engine blocks and cylinder heads.

10-602-162 Engines Machining 2 (2 cr.)
Focuses on further developing skills used in rebuilding automotive engines. An emphasis is placed on refurbishing engine blocks and cylinder heads to factory specifications.

10-602-163 Engines Machining 3 (1 cr.)
A simulated occupational experience designed to hone students' advanced-level skills used in modifying or rebuilding automotive engines. An emphasis is placed on customized rebuilding of engine blocks and cylinder heads meeting or exceeding factory specifications as needed for high demand or high performance applications.

10-602-164 Automotive HVAC-ASEP (2 cr.)
Focuses on developing the skills needed to diagnose, service, and repair General Motors climate control systems including heating, cooling, and air distribution. Upon successful completion of the Mobile Refrigerant Handling unit (ATCP-136), a state certificate will be issued.

10-602-165 Advanced Chassis Systems-ASEP (2 cr.)
Focuses on developing the skills needed to diagnose, service, and repair General Motors antilock brake, vehicle stability enhancement, and electronic steering and suspension systems.

10-602-166 Engine/Powertrain Diagnostics-ASEP (1 cr.)
Focuses on developing the GM ASEP students' ability to diagnose engine concerns as they relate to mechanical, electrical, fuel or auxiliary systems. Then, following the GM Service information they will repair the system back to OEM specifications.

10-602-167 Automatic Transmission/Transaxle-ASEP (3 cr.)
Designed to give an ASEP student the basic knowledge and skills needed to service General Motors automatic transmissions/transaxles. Principles of hydraulics and electronic controls applied to GM automatic transmissions are covered. Students overhaul a variety of GM units.

10-602-177 Import Electrical Systems (2 cr.)
Provides the student with the knowledge of import automotive starting and charging systems. Service and repair of import starting and charging systems, along with the usage of test equipment for diagnosis will also be covered.

10-602-178 Import Electronic Controls (3 cr.)
Provides students with the knowledge of import electronic components. Electronic terminology, computer networking, usage of lab scopes and operation of computer controlled devices are emphasized.
## Course Descriptions

**10-602-181 Import Heating/Ventilation/Air Conditioning (3 cr.)**
Provides the student with the basic knowledge and skills needed to service and repair heating, cooling and air conditioning systems specific to import vehicles. Import automatic and dual zone climate control systems will also be covered. Students will learn and practice proper handling of R12/R134a refrigerants and will also become state certified to perform automotive refrigerant repairs.

**10-602-182 Import Engine Repair (4 cr.)**
Teaches students to diagnose and repair engine mechanical failures with a focus on import automotive engine design and construction. Students will disassemble import engines, clean, inspect, measure and recondition internal engine components. On-vehicle diagnosis will include the usage of compression, vacuum and cylinder leakage testers.

**10-602-183 Import Engine Performance 1 (3 cr.)**
Gives students the knowledge required to diagnose and service import ignition and fuel systems and introduces emission control systems.

**10-602-185 Import Manual Drivetrain (3 cr.)**
Is designed to give students the basic knowledge and skills needed to service import manual transmissions, drivelines, differentials and axles. The students receive hands-on practice in diagnosing and repairing of these units.

**10-602-186 Import Automatic Transmissions (4 cr.)**
Designed to give students the basic knowledge and skills needed to service import automatic transmissions/transaxles. Principles of hydraulics and electronic controls applied to import automatic transmissions are covered. Students overhaul a variety of import units.

**10-602-187 Import Hybrid Vehicle Systems (2 cr.)**
Gives students the knowledge and skills needed to service the growing number of import vehicles. Emphasis is on safety precautions and consistently variable transmissions.

**10-602-188 Import Engine Performance 2 - 4 Cr (4 cr.)**
Teaches students to troubleshoot and repair drivability concerns with import automobiles. This course will focus on computerized engine controls, enhanced emissions and engine control sensors.

**10-602-189 Import Advanced Chassis Systems (2 cr.)**
Focuses on developing the skills needed to diagnose, service, and repair antilock brake, vehicle stability enhancement, and electronic steering and suspension systems.

**10-602-195 Advanced Chassis Systems (2 cr.)**
Focuses on developing the skills needed to diagnose, service, and repair antilock brake, vehicle stability enhancement, and electronic steering and suspension systems.

**10-602-196 Automotive Climate Control Systems (3 cr.)**
Focuses on developing the skills needed to diagnose, service, and repair climate control systems including heating, cooling, and air distribution. Upon successful completion of the Mobile Refrigerant Handling unit (ATCP-136), a state certificate will be issued.

**10-602-197 Engine Performance 1 (3 cr.)**
Focuses on developing the skills needed to diagnose, service, and repair powertrain control and ignition systems. Emphasis is placed on diagnostic procedures and the problem-solving techniques associated with automotive engine performance and drivability.

**10-602-198 Engine Performance 2 (4 cr.)**
Focuses on developing the skills needed to diagnose, service, and repair fuel and emission control systems. Emphasis is placed on diagnostic procedures and the problem-solving techniques associated with automotive engine performance and drivability.

### 605 Electronic Technology

**10-605-100 Applied Human Biology for BMET (3 cr.)**
Introduces essential human biology, anatomy, physiology and medical terminology for biomedical equipment technicians. The course will focus on the vocabulary necessary for effective communication in the hospital environment as part of the health care team.

**10-605-105 Introduction to Radiography Equipment (3 cr.)**
Explores the fundamentals of diagnostic radiography equipment. The principles of an x-ray system will be explained including the x-ray generation, image formation and film processing. Focus will be on both safety and quality.

**10-605-107 Introduction to Medical Electronics (3 cr.)**
An introduction to the field of Biomedical Electronics Technology. It is an introduction to physiologic measurements, including cardiovascular, pulmonary, and applicable pressure and temperature measurements. Operation of common biomedical electronic equipment is discussed. Hospital departments and safety regulations are explained.
10-605-111 AC Circuits 2-Electronics/EET (1 cr.)
Covers the application of basic theory to AC circuits. Topics include sine-wave description, reactance, phase and fundamental AC power concepts. RC, RL and RLC circuits using complex numbers are analyzed. Laboratory and computer analysis activities are performed to enhance the theory.

10-605-112 DC Circuits 3 - Electronics/EET (1 cr.)
Examines the theory, application and design of series/parallel circuits such as loaded and unloaded voltage dividers and Wheatstone bridge. Specific resistor characteristics are covered. Instantaneous voltage and current values for RC and RL circuits are introduced. This course includes in-depth theory of inductors, capacitors with series and parallel applications and various types of each component. Laboratory activities are performed to verify the theory.

10-605-113 DC Circuits 4 - Electronics/EET (1 cr.)
Introduces circuit network theorems. Superposition, Thevenin, Norton, Kirchhoff’s Voltage (KVL) and current (KCL) laws, and delta-wye conversions are used to solve advanced circuits. Computer analysis and laboratory activities are performed to verify the theory.

10-605-116 AC Circuits 3 - Electronics/EET (1 cr.)
Examines circuit analysis techniques for solving complex AC series-parallel circuits. Complex numbers combined with the circuit theorems learned in DC Circuits 4 are applied to solve AC circuits. Computer analysis and laboratory activities are performed to enhance the theory.

10-605-117 AC Circuits 4 - Electronics/EET (1 cr.)
Introduces series and parallel RLC circuits and resonance. Passive filters are also introduced. This course also covers transformers and their applications, resonance and filter circuits. Circuit analysis software packages are used to evaluate circuit operation. Laboratory activities are performed to verify the theory.

10-605-118 Solid State 3 (1 cr.)
Covers DC and AC analysis of amplifiers. Bypass and coupling capacitor functions, along with circuit limitations due to circuit configuration, are also examined.

10-605-119 Solid State 4 (1 cr.)
Covers Field Effective Transistor (FET) characteristics along with switching and amplification operations. Students also do circuit analysis of amplifier configurations.

10-605-120 Power Control Devices (1 cr.)
Covers operating characteristics of SCR, TRIAC and IGBTs. Amplitude and phase control applications are presented. Opto device characteristics and applications are also topics of this course. Current Hoggling and reverse recovery details are explored. Various amplifier classifications are applied such as Push-Pull.

10-605-121 Power Control Applications (1 cr.)
Covers various methods of power control to include pulse width modulation, skip cycle and zero-cross. H-bridge function and application are covered. Also covered are microprocessor-based power control applications to include usage of SCR, TRIAC, IGBT, FET, H-Bridge, PID and robot control. Energy efficient circuits, noise reduction techniques, EMI, shielding, grounding, signal cross-talk and power line disruptions are examined.

10-605-122 PC Hardware/Operating Systems (1 cr.)
Trains students to work with a critical tool for technicians and become familiar with computer repair (A+ Prep). Students will experience all through hands-on laboratory activities. They will also learn to understand fundamental computer hardware/software concepts, configuration and troubleshooting.

10-605-123 Digital Electronics 2 - Electronics/EET (1 cr.)
Examines data manual usage. This course introduces programmable logic devices and Karnaugh mapping. It also covers encoders, decoders, multiplexers, binary adders and parity circuits. Laboratory activities are performed to verify the theory.

10-605-124 Digital Electronics 3 (1 cr.)
Examines the operation of various shift registers, flip-flops, arithmetic circuits, numbering systems and practical digital devices. Mono-stable and a-stable multi-vibrators as well as glitch-free clocks are covered. Laboratory activities are performed to verify the theory.
10-605-133 Digital Electronics 4 (1 cr.)
Covers counters, reviews Sum-of-Products and Product of Sums and more in-depth coverage of Karnaugh maps. This course utilizes a group based final project.

10-605-134 Digital Electronics 1-Electronics/EET (1 cr.)
Introduces digital electronics including Boolean, the operation of logic gates, and the theory of combination logic circuits. Laboratory activities are performed to verify the theory.

10-605-138 Op Amps and Active Filters (2 cr.)
Emphasizes modern linear integrated circuits (ICs). Covered in depth are the operational amplifier IC and its circuit applications: amplifying, comparing, summing, wave shaping and filtering. Laboratory time is spent simulating and constructing circuits and evaluating and troubleshooting circuitry.

10-605-140 Microprocessors/Micro-controllers (4 cr.)
Discusses embedded computer systems. This course emphasizes the architecture, programming and operation of these computers. It covers machine and assembly language concepts as well as basic interfacing. Laboratory activities are performed to verify the theory. Students should have completed through Digital Electronics 3 (10-605-132).

10-605-142 LabVIEW and Data Acquisition (DAQ) (1 cr.)
Introduces LabVIEW, which is used to write programs using the computer’s serial port and computer-based data acquisition cards. Projects introduce new features of the acquisition boards and the software package. Students write programs for data acquisition applications involving digital input and output, analog input and output, and serial input and output. A working knowledge of solid-state electronics is required.

10-605-143 Embedded Controllers & SCADA (1 cr.)
Expands upon the micro-controller used in the Microprocessor/Micro-controllers course. Student projects introduce new components of the micro-controller. Digital I/O, analog input, and serial communications are important components of the projects. The use of wireless communication devices is discussed. LabVIEW is used to integrate the micro-controllers with DAQ cards.

10-605-150 Computer Programming for Technicians (3 cr.)
Introduces structured programming using the Turbo C++ programming language. Emphasis is on the Turbo C++ development system and structured programming techniques including data fundamentals, decisions, loops, function, arrays, structures and file I/O. Theory will be applied in the computer laboratory with students writing applications relative to electronics.

10-605-151 Automated Testing - GPIB & LabVIEW (1 cr.)
Introduces students to the automated testing field with an emphasis on the graphical programming language G used in LabVIEW programming. Programming techniques are related to Turbo C++ and applied to the general purpose instrumentation bus (GPIB), serial bus and the control of communications-capable test instruments. Lab work includes the design, programming and testing of electronic test procedures.

10-605-154 Embedded C Programming (2 cr.)
Teaches students to program PCs and microcontrollers using the C language. They will apply fundamental programming skills like branching and repetition on both analog and digital Input-Output in the lab.

10-605-156 CAD for Electronics (1 cr.)
Introduces students to computer-aided design (CAD) techniques used in the electronics field. Students learn the basics of the AutoCAD software, including the draw, modify, dimension and plotting sets of commands. Students acquire the skills needed to create an electronics symbols library and to draw electronic schematics.

10-605-163 Electronic Construction Techniques (1 cr.)
Introduces the use of common tools for constructing electronic devices. The safe use and application of hand and power tools is practiced through construction projects. Soldering techniques, both through-hole and surface mount, are studied in detail.

10-605-164 Circuit Design and Fabrication (2 cr.)
Emphasizes modern circuit fabrication techniques through a student-centered research project. Techniques include prototyping, component and trace layout, circuit board etching and troubleshooting. The research project includes both oral and written technical reports.

10-605-170 Digital Communications (1 cr.)
Focuses on communication protocol and bus structures such as RS232, 420, 485, IEEE 488 (GPIB), IEEE 1492 (Firewire) and 12C. PCM, PAM, FSK, time, space and frequency division multiplexing are also covered. Synchronous and asynchronous characteristics and applications, data compression and encryption, and error checking schemes are introduced, and industrial networking topics are discussed.
10-605-174 Programmable Logic Controllers & Drive Applications (1 cr.)
Focuses on advanced PLC topics such as BCD I/O and A/D I/O. PLC to Drive communication and remote I/O are also covered. Lab projects focus on networking and communication between the PLC and Drive as found in typical applications.

10-605-178 Data Comm Cabling-Copper Based Systems (2 cr.)
Prepares the student to become an entry-level technician working with data cabling. Tool use and construction techniques are emphasized along with industry standards, troubleshooting and repair. Nationally recognized tests may be attempted to earn a certificate.

10-605-182 Wireless Communications (2 cr.)
Provides an in-depth study of radio communication circuits. Topics include AM, SSB, FM, phase modulations, receivers, transmitters, transmission lines and antennas. Students construct several projects following industry safety procedures.

10-605-183 Wireless Communications 2 (1 cr.)
Covers digital radio, feed lines and transmission in line Z, antennas, microwave, digital TV, composite video and video data. ISDN, ATM, Packet Switching, Cellular and PCS technology is covered as well. ISDN, DS-1, DS-3, OC-3 through 192 as applied to data and telecommunications. Voice over IP, IP H.323 standards, IP tunneling and Gigabit Ethernet topics are covered as well. Other topics covered include ATM passive optical networking (APON), Broadband passive optical networking (BPON), Switched virtual circuits (SVC), Private virtual circuits (PVC), Class of Service (CoS), and encoding and transport schemes to include IP, MPEG - 1,2,4 H.324. Labs support the theory topics to the extent possible.

10-605-184 Photonic Devices & Fiber Optics (1 cr.)
Covers operating characteristics and applications of photonic devices and fiber optics. Due to the dynamic nature of this area, photonic devices which may be covered include optical transmitter and receiver devices, imaging devices and devices used in fiber optics applications.

10-605-190 Electronic Certification Review (1 cr.)
Provides an individualized review of basic electronic theory in preparation for the Certified Electronics Technician test from ISCET, the state employment test for electronic technicians. An initial pretest guides independent study.

10-605-196 Product Testing/Systems (1 cr.)
Focuses programming on Test and Measurement with the graphical programming language LabVIEW. Students will create electronic product testing, instrumentation, data acquisition and data analysis.

606 Mechanical Technology

10-606-102 CATIA V5 - Basic (2 cr.)
Introduces methods for creating three-dimensional models using CATIA V5 software. Topics include product structure, sketcher, solid modeling, drafting, assembly, surface modeling and sheet metal design. Basic computer skills are required.

10-606-107 CATIA V5 - Advanced (2 cr.)
Covers the advanced features of three-dimensional modeling, analysis and simulation. This course was created for designers with a CATIA V5 background. It focuses on solid, surface, sheet metal, mold tooling, systems design, stress analysis and kinematics.

10-606-109 Geometric Dimensioning and Tolerancing (2 cr.)
Provides fundamentals of geometric dimensioning and tolerancing (GD&T) per the ASME Y14.5M–1994 standard. The development of the technical knowledge and skills required for application and interpretation of GD&T is the focus of the course. Design requirements for functional gages and other methods used to verify GD&T specifications are also presented.

10-606-111 Design Problems (4 cr.)
Applies the principles and methods used to solve basic design problems. Students prepare preliminary layouts, assembly drawings and detail drawings. CAD experience is required.

10-606-112 AutoCAD 3D (2 cr.)
Utilizes AutoCAD software to allow learners to enter into the world of 3D design. Topics include 3D coordinate systems, surface and solid model creation, solid model editing, rendering and an introduction to visualization and animation.

10-606-113 Technical Drafting 1 (5 cr.)
Covers concepts from the initial design process to the generation of Computer Aided Drafting (CAD) documents that precisely and graphically describes a part. Students will learn common industry drafting practices as well as CAD standards and guidelines. The course will lay down the proper groundwork for the Technical Drafting 2 course.
10-606-113A Technical Drafting 1A (3 cr.)
Emphasizes current industrial practices. Topics include instrument usage, applied geometry, technical sketching, multi-view projection and sections.

10-606-113B Technical Drafting 1B (2 cr.)
A continuation of Technical Drafting 1A, which emphasizes current industrial practices. Dimensioning and tolerancing, threads and fasteners, and auxiliary views are covered.

10-606-114 AutoCAD, Introduction to (1 cr.)
Covers the very basics of AutoCAD - introduction to the user interface, basic drawing commands, basic editing commands, and basic viewing commands. This course will give the student a comfort level for working within the AutoCAD environment and the knowledge needed for more advanced CAD courses offered within the various degree programs.

10-606-115 Design of Tooling (4 cr.)
Provides a background in the fundamentals of design and the application of jigs, fixtures, gauging devices and stamping dies in the manufacturing process. Students prepare general assembly and detail drawings of tool designs that use commercial tooling components. CAD experience is required.

10-606-117 Technical Drafting 2 (4 cr.)
A continuation of Technical Drafting 1. Topics include descriptive geometry, intersections and developments, and working drawings. CAD experience is required.

10-606-117A Technical Drafting 2A (1 cr.)
A continuation of Technical Drafting 1A and 1B. Topics include working drawings such as detail and general assemblies.

10-606-117B Technical Drafting 2B (3 cr.)
A continuation of Technical Drafting 2A. Topics include descriptive geometry and intersections and developments.

10-606-119 Statics and Strength of Materials (3 cr.)
Uses mathematical concepts to determine how forces are distributed through trusses and other rigid structures. Friction and applications of direct stress, strain, thermal expansion and thermal stress are covered.

10-606-121 Elements of Machine Design (3 cr.)
Examines a variety of problems involving the principles of design. Topics include centroids, moments of inertia, beam selection, bending moments, torsion, Mohr’s circle, combined stress and beam deflection. Algebra and other applications of mathematics are used extensively.

10-606-123 Kinematics (4 cr.)
Emphasizes motion analysis of existing mechanisms. Motion characteristics are examined through the use of skeleton diagrams and graphical techniques. Topics include application of skeleton diagrams, angular velocity, linear velocity, velocity polygons, cams, gears and gear trains. CAD experience is required.

10-606-124 Intro to Product Design & Rapid Prototyping (2 cr.)
Introduces students to additional solid modeling software, the design process, and rapid prototyping of models. Previous solid modeling experience required.

10-606-125 3D Modeling and Materials (2 cr.)
Familiarizes the learner with methods of modeling and material creation to build realistic-looking scenes for output to print, Web, animation or video. The student will end the class with a final project of their own choosing, demonstrating their knowledge of the skills learned in this class.

10-606-126 3D Rendering and Animation (2 cr.)
Focuses on the creation of an animation project (video) that incorporates everything you have learned in 3D Modeling and Materials and the new topics in 3D Rendering and Animation. Techniques for rendering, special effects, character movement, and particle systems will be explored.

10-606-127 Intermediate AutoCAD (1 cr.)
Builds upon the groundwork laid down in either Intro to AutoCAD or Technical Drafting 1. Students will learn more about drawing commands, editing commands, properties of objects, dimensioning and printing.

10-606-128 Advanced AutoCAD (2 cr.)
Suitable for students comfortable with the basics of creating an AutoCAD drawing, as taught in Intro to AutoCAD and Intermediate AutoCAD. This course focuses on using efficiency tools including grips and tool palettes, drawing with complex objects including polylines, regions and advanced text objects, defining blocks and attributes, using external reference files and image files, using layouts and advanced plotting features, creating sheet sets, and enhancing productivity with simple customization of AutoCAD. It is recommended that students have completed Intro to AutoCAD and Intermediate AutoCAD, or have appropriate industry experience in AutoCAD.
10-606-130 CAD Standards (3 cr.)
CAD standards is an often overlooked concept within a CAD department. Efficiency and consistency can be optimized with well thought out and documented CAD standards. Standards and how they apply to layers, dimensions, text, titleblocks, plotting, as well as other objects, will be covered. Students will be allowed to work with the CAD program of their choice (AutoCAD, Inventor, SolidWorks or Catia). The course assumes familiarity and a comfort level with at least one of those software packages.

10-606-131 AutoCAD Customization (2 cr.)
Will introduce the student to the various objects that can be customized within AutoCAD’s graphical user interface. AutoCAD’s macro language and DIESEL language will be applied to the ribbon, toolbars, tool palettes and other interface objects. Other customizable objects will also be covered. The course assumes familiarity and a comfort level with AutoCAD and will use the latest release of the software, however, backward compatibility will be discussed.

10-606-132 Intro to Visual LISP Programming (3 cr.)
Teaches the non-programmer how to program AutoCAD to automate common and not so common tasks. Information can be gathered and used over and over again. Terminology, storage functions, logic, looping and branching functions are all covered. You will be amazed at the power you can build into your programs! The course assumes familiarity and a comfort level with AutoCAD and will use the latest release of the software, however, backward compatibility will be discussed.

10-606-133 Advanced Visual LISP Programming (3 cr.)
Builds on the concepts taught in the Introduction to Visual LISP course. Entity manipulation, working with selection sets and symbol table access are some of the topics to be covered. The course assumes familiarity and a comfort level with AutoCAD and will use the latest release of the software, however, backward compatibility will be discussed.

10-606-134 DCL Programming (3 cr.)
Takes Visual LISP to the next level. Dialog Control Language allows students to create a dialog box interface for their programs. Tools such as buttons, toggles, radio buttons, lists, sliders and image tiles are all covered in this course. The course assumes previous Visual LISP programming experience.

10-606-135 VBA Programming (3 cr.)
Introduces Visual Basic for Applications, which is a programming interface for many computer applications. In this course, the basics of the language will be examined. Students will be allowed to use the CAD program of their choice (AutoCAD, Inventor, SolidWorks or Catia) and apply the principles of VBA to automate the tasks of the CAD software. The course assumes a very high comfort level with AutoCAD, Inventor, SolidWorks or Catia.

10-606-136 Document Management - Autodesk Vault (2 cr.)
Focuses on the use of Autodesk Vault for setting up a safe and secure file sharing environment for companies that are using Autodesk Inventor or AutoCAD. The course assumes familiarity with AutoCAD or Inventor. Knowledge of Product Life Management (PLM) helpful but not required.

10-606-137 Document Management - SmartTeam (2 cr.)
Focuses on the use of SmartTeam for setting up a safe and secure file sharing environment for companies that are using SolidWorks or Catia. The course assumes familiarity with SolidWorks or Catia. Knowledge of Product Life Management (PLM) helpful but not required.

10-606-138 Document Management - PDMWorks (2 cr.)
Focuses on the use of PDMWorks for setting up a safe and secure file sharing environment for companies that are using SolidWorks or Catia. The course assumes familiarity with SolidWorks or Catia. Knowledge of Product Life Management (PLM) helpful but not required.

10-606-139 Introduction to Autodesk Inventor (2 cr.)
Will introduce the student to the basics of Autodesk’s Inventor software. Close attention will be paid to properly navigating the interface. Sketching, dimensional and geometric constraints, part modeling, drawing creation, and assembly modeling will all be examined.

10-606-140 Advanced Autodesk Inventor (2 cr.)
Is a continuation of the Introduction to Inventor course. Surface modeling, sheet metal, creating part libraries, weldments and managing large assemblies are the major topics to be covered. The course assumes at least entry-level familiarity with Autodesk Inventor.

10-606-141 Introduction to SolidWorks (2 cr.)
Will introduce the student to the basics of the SolidWorks software. Close attention will be paid to properly navigating the interface. Sketching, dimensional and geometric constraints, part modeling, drawing creation, and assembly modeling will all be examined.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-606-142</td>
<td>Advanced SolidWorks (2 cr.)</td>
<td>Is a continuation of the Introduction to SolidWorks course. Surface modeling, sheet metal, creating part libraries, weldments and managing large assemblies are the major topics to be covered. The course assumes at least entry-level familiarity with SolidWorks.</td>
</tr>
<tr>
<td>10-606-143</td>
<td>SolidWorks Customization (2 cr.)</td>
<td>Will introduce the student to the various objects that can be customized within SolidWorks' graphical user interface. Its macro language will be covered and applied to toolbars and other input mechanisms. The course assumes familiarity and a comfort level with SolidWorks.</td>
</tr>
<tr>
<td>10-606-144</td>
<td>Inventor Customization (2 cr.)</td>
<td>Will introduce the student to the various objects that can be customized within Inventor's graphical user interface. Its macro language will be covered and applied to toolbars and other input mechanisms. The course assumes familiarity and a comfort level with Inventor.</td>
</tr>
<tr>
<td>10-606-145</td>
<td>Catia Customization (2 cr.)</td>
<td>Will introduce the student to the various objects that can be customized within Catia's graphical user interface. Its macro language will be covered and applied to toolbars and other input mechanisms. The course assumes familiarity and a comfort level with Catia.</td>
</tr>
<tr>
<td>10-606-190</td>
<td>Mechanical Design Occupational Experience (2 cr.)</td>
<td>Provides a working relationship with the student, employer and the FVTC Mechanical Design department. Students employed in industry apply their training and acquire skills not available in the classroom. The ability to take this course is subject to job site availability, appropriateness of available training, scheduling and travel. Department consent is required.</td>
</tr>
<tr>
<td>609-101</td>
<td>Electrical Safety, Industry (1 cr.)</td>
<td>Describes hazards of electrical work and basic approaches to working safely. Students learn skills to recognize, evaluate and control electrical hazards. Includes personnel protective equipment and how to perform construction tasks safely. Introduces OSHA mandated Lockout/Tagout procedures and prepares learners for additional safety training. Upon successful completion, the student will receive a Department of Labor OSHA General Industry Safety and Health 10-hour completion card.</td>
</tr>
<tr>
<td>609-170</td>
<td>Ladder Logic and Control Devices (1 cr.)</td>
<td>Introduces ladder logic diagrams used to document power control networks. Discrete industrial devices are also studied including switches, contactors, relays, timers, and motor starters. Students will design, construct, and troubleshoot ladder logic circuitry following safe working procedures. Memory addressing schemes and PLC hardware of an Allen-Bradley SLC-500 is introduced. Students taking this course should have a working knowledge of DC and AC circuits.</td>
</tr>
<tr>
<td>609-171</td>
<td>Electrical Motors (1 cr.)</td>
<td>Evaluates the operation of AC motors and DC motors such as the series, shunt and compound motors. Various types of servo motors are also examined. Laboratory activities reinforce the theory. A working knowledge of electronics is recommended.</td>
</tr>
<tr>
<td>609-172</td>
<td>DC/AC Variable Speed Drives (1 cr.)</td>
<td>Covers operational controls, characteristics and drive functionality. Laboratory activities involve drive setup and wiring as well as safe troubleshooting and testing practices. A working knowledge of electronics is recommended.</td>
</tr>
<tr>
<td>609-173</td>
<td>Programmable Logic Controllers 1 (1 cr.)</td>
<td>Covers PLC I/O configuration, ladder diagram networks, latches, timers, counters, comparing and forcing concepts. Hands-on labs use the Allen Bradley SLC-500 series controllers.</td>
</tr>
<tr>
<td>620-103</td>
<td>DC Circuits 3 - Aircraft/Electromechanical (1 cr.)</td>
<td>Examines the theory and application of series/parallel circuits such as loaded and unloaded voltage dividers, the Wheatstone bridge, and analog ammeter and voltmeter design.</td>
</tr>
<tr>
<td>620-152</td>
<td>Industrial Solid State 1 (1 cr.)</td>
<td>Examines the theory of the 555 integrated circuit timer and the 741 operational amplifier. Laboratory activities are performed to verify the theory.</td>
</tr>
</tbody>
</table>
10-620-153 Industrial Solid State 2 (1 cr.)
Studies the operation of semiconductor power devices that drive industrial actuators such as the UJT, SCR and TRIAC. Amplitude, phase control and pulse-width modulation applications are presented. Laboratory activities are performed to verify the theory.

10-620-154 Hydraulics 1 (1 cr.)
Introduces the fundamental principles and laws of fluid power. Laboratory activities reinforce the theory.

10-620-155 Hydraulics 2 (1 cr.)
Examines the theory of pumps, actuators and various types of valves. Laboratory activities are performed to verify the theory.

10-620-156 Hydraulics 3 (1 cr.)
Examines accessory components of a hydraulic system. This course concludes with the analysis of several hydraulic circuits. Laboratory activities are performed to verify the theory.

10-620-159 Mechanical Linkages 1 (1 cr.)
Covers the mechanical theory of various linkages such as levers, four-bar mechanisms, shaft couplings and alignment. Laboratory activities are performed to verify the theory.

10-620-161 Mechanical Linkages 2 (1 cr.)
Covers the theory and application of lubrication principles, plain bearings and roller element bearings. Laboratory activities are performed to verify the theory.

10-620-162 Pneumatics 1 (1 cr.)
Introduces the principles of compressed air and studies various control operations such as speed, force and direction. Laboratory activities are performed to verify the theory.

10-620-163 Pneumatics 2 (1 cr.)
Covers the different types of valves and pilot devices. This course concludes by analyzing how actuators and components control various types of pneumatic circuits. Laboratory activities are performed to verify the theory.

10-620-169 Electronic Shop Practices (1 cr.)
Introduces various aspects of the electronic shop such as basic soldering principles, surface mount technology, troubleshooting, repairing and circuit protection devices and performing panel-wiring exercises. Customer relations is also discussed.

10-620-170 Electrical Generators & Power Dist Systems (1 cr.)
Examines the construction and operation of generators and covers power distribution systems such as the single-phase Edison and three-phase delta and wye configurations. The theory is reinforced by laboratory activities.

10-620-171 Electrical Motors-DC (1 cr.)
Evaluates the operation of DC motors such as the series, shunt, and compound motors. Various types of servo motors are also examined. Laboratory activities reinforce the theory. A working knowledge of electronics is recommended.

10-620-172 Electrical Motors-AC (1 cr.)
Covers the operation of single-phase and three-phase AC motors. Laboratory activities are performed to reinforce the theory.

10-620-173 Servomechanisms 1 (1 cr.)
Introduces the servomechanism systems used to operate many types of automated systems. The concepts and elements of open and closed-loop systems are covered. On/off and PID control modes are also presented. Laboratory activities are performed to verify the theory.

10-620-174 Servomechanisms 2 (1 cr.)
Feedback sensing devices are introduced, and the operation of position and velocity control systems is studied. Laboratory activities are performed to verify the theory.

10-620-177 Mechanical Drives 1 (1 cr.)
Covers the principles, operation, maintenance and configurations of belt and chain drives. Laboratory activities are performed to verify the theory.

10-620-178 Mechanical Drives 2 (1 cr.)
Covers the principles, operation, maintenance and configuration of gears, gearing and power transmission. Laboratory activities are performed to verify the theory.

10-620-182 Programmable Logic Controllers 2 (1 cr.)
Covers sequencers, jumps, arithmetic operations and analog operations of the Allen-Bradley SLC-500 programmable controller. Sensor interfacing is included. Programming exercises verify the theory.

10-620-183 Process Variables and Measurements 1 (1 cr.)
Covers the properties and characteristics of pressure and temperature variables associated with process control. Instruments that measure these variables are calibrated and used to determine the condition of the variables. Completion of Pneumatics 1 and Solid State 2 is recommended before taking this course.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>10-620-184</td>
<td>Process Variables and Measurements 2 (1 cr.)</td>
</tr>
<tr>
<td></td>
<td>Covers the properties and characteristics of level, flow and analytical variables associated with process control. Instruments that measure these variables are calibrated and used to determine the condition of the variables.</td>
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<tr>
<td>10-620-185</td>
<td>Instrumentation and Process Control 1 (1 cr.)</td>
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<td></td>
<td>Describes the instrument devices used in open- and closed-loop process control systems, illustrates the P&amp;ID symbols to which they are assigned, and performs calibration techniques. Laboratory activities are performed to verify the theory.</td>
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<tr>
<td>10-620-186</td>
<td>Instrumentation and Process Control 2 (1 cr.)</td>
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<tr>
<td></td>
<td>Describes the various production methods used in process industries and provides a background of PID control strategies and controller tuning to accommodate the dynamics of various systems. Laboratory activities are performed to verify the theory.</td>
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<tr>
<td>10-620-187</td>
<td>Sensors (1 cr.)</td>
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<tr>
<td></td>
<td>Covers various types of sensors used in industrial operations such as inductive and capacitive proximity detectors, Hall-effect devices and various optical sensing modes. Laboratory activities are performed to verify the theory.</td>
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<tr>
<td>10-620-188</td>
<td>System Troubleshooting (1 cr.)</td>
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<td></td>
<td>Develops troubleshooting skills by using several closed-loop systems on a level and flow process trainer. Students identify faults electrically inserted into this trainer by recognizing symptoms, creating and using flow charts for analysis, and finding the problem with test instruments.</td>
</tr>
<tr>
<td>10-620-189</td>
<td>Electromechanical Systems 1 (1 cr.)</td>
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<tr>
<td></td>
<td>Capstone course that uses the competencies learned throughout the Electromechanical program to operate various systems that interface with each other such as digital, servomechanisms, electro-hydraulic and gear mechanisms. Laboratory activities are performed to verify the theory.</td>
</tr>
<tr>
<td>10-620-190</td>
<td>Advanced AC/DC Variable Speed Drives (1 cr.)</td>
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<tr>
<td></td>
<td>Covers graphical programming and various communication techniques of current and vector drives. A multifunctional trainer is configured to demonstrate complex master/slave drive functions, on-line monitoring of drive performance, and to build troubleshooting skills.</td>
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<tr>
<td>10-620-191</td>
<td>Advanced Systems Control (1 cr.)</td>
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<tr>
<td></td>
<td>Capstone course that uses the Allen-Bradley SLC-500 programmable controller to operate servomechanism systems and a pneumatic robot. Laboratory activities are performed to verify the programs written by the student.</td>
</tr>
<tr>
<td>10-620-192</td>
<td>Advanced Programmable Logic Controllers 1 (1 cr.)</td>
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<tr>
<td></td>
<td>An introduction to the Siemens S7-200 Programmable Controller. Course work will include controller start-up procedures, examination of data types and memory modes, the basic instruction set for programming ladder logic, and hands-on activities used to reinforce the areas studied.</td>
</tr>
<tr>
<td>10-620-193</td>
<td>Advanced Programmable Logic Controllers 2 (1 cr.)</td>
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<tr>
<td></td>
<td>A continuation of the study of the Siemens S7-200 Programmable Controller. Examination of advanced ladder diagram instructions and industrial PLC applications is the emphasis of the course. Hands-on activities programming the PLC for specific industrial applications are used to reinforce the areas studied.</td>
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<tr>
<td>10-620-194</td>
<td>Industrial Operations 1 (1 cr.)</td>
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<td></td>
<td>Theory-based course primarily designed for students who have had little or no industrial experience. The organizational structure and departmental responsibilities of a typical manufacturing company are discussed. Plant layout, material handling, production and inventory strategies are also covered.</td>
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<tr>
<td>10-620-195</td>
<td>Industrial Operations 2 (1 cr.)</td>
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<td></td>
<td>Theory-based course that introduces the student to the fields of industrial engineering such as time and motion study, quality control and engineering economy.</td>
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<tr>
<td>10-620-196</td>
<td>Robotics 1 (1 cr.)</td>
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<td></td>
<td>Introduces the terminology, movements and the physical construction of the robot and the applications for which they are used. Basic programming is also covered. Students become familiar with the equipment in laboratory activities. Instructor permission required.</td>
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<tr>
<td>10-620-197</td>
<td>Robotics 2 (1 cr.)</td>
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<tr>
<td></td>
<td>Requires students to write programs that enable a robot to perform various operations. Laboratory activities are completed to verify the programs.</td>
</tr>
<tr>
<td>621 Industrial Welding Technology</td>
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<tr>
<td>10-621-101</td>
<td>Welding Codes &amp; Testing (2 cr.)</td>
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<tr>
<td></td>
<td>Begins by providing an overview of welding codes and inspector’s responsibilities. The focus then moves to the study of a specific welding code book. The course culminates with the student cutting, polishing, and testing weldments in accordance with the welding code previously studied.</td>
</tr>
</tbody>
</table>
10-621-111 Welding NDE (2 cr.)
Focuses on nondestructive testing (NDE). Emphasis will be placed on Visual Examination, Liquid Penetrant, Magnetic Particle and Ultrasonic Testing. Emphasis will also be placed on both the theoretical and hands-on use of equipment used in nondestructive testing.

10-621-113 Robotic Arc Welding (2 cr.)
An overview of robots used in industry. Automatic welding principles, including material handling, jigs and fixtures, are evaluated. Students program a robot to weld fixtured parts using the GMAW process.

10-621-115 Welding Processes, Design & Costs (2 cr.)
Studies such processes as plasma, submerged, thermit and electron beam welding. Also emphasizes design concepts and rules of design as well as estimating costs of welding.

10-621-116 Welding Metallurgy (3 cr.)
Introduces students to basic metallurgy including the location of ore deposits, derivation of metals from their ores, refinement and purification, and admixture and alloying. The classification of ferrous and nonferrous metals and the study of basic metallurgical diagrams is also discussed. Students focus on the behavior of metal during welding and the effects of welding on the properties of metals.

10-621-117 Weldability of Materials (3 cr.)
Focuses on problems and solutions encountered when welding similar and dissimilar metals. Students will learn to determine the capacity of a metal to be welded and perform satisfactorily under fabrication conditions imposed. Emphasis is on porosity in welds, hydrogen problems, heat treatments in welding, corrosion in stainless steel welds, hot and cold cracking and their solutions.

10-621-119 Forging, the Blacksmith’s Art (2 cr.)
Expands on the science of metallurgy, combining the learning of hot and cold forming skills at the manual level that brings the student to a more intimate understanding of metal fabrication. Students will learn and demonstrate metal forming skills to create tools and decorative steel shapes. Students must have previous experience in welding, forging or hot manufacturing processes.

10-621-121 SMAW Techniques 1 (2 cr.)
Covers the process commonly known as stick welding. Upon completion of this course, the student will be able to weld in all positions, read some basic weld symbols, and have a basic understanding of written welding procedures.

10-621-122 SMAW Techniques 2 (2 cr.)
A continuation of SMAW Techniques 1. Students will complete lab exercises from SMAW Techniques 1. The student will be able to thoroughly understand a written welding procedure. Emphasis will be placed on the AWS D1.1 welding code. Upon completion of this course, the student will be able to weld in all positions without a backing plate on both V-Groove plate and pipe.

10-621-123 GMAW Techniques 1 (2 cr.)
Demonstrates welding on steel sheet metals and plates. Emphasis is placed on axial spray, pulse spray and short circuit mode of transfer. Upon completion of this course, the student will be able to weld in all positions, read basic weld symbols, and have an understanding of written welding procedures.

10-621-124 GMAW Techniques 2 (2 cr.)
Teaches students to weld on stainless steel and aluminum sheet metal and plate. The student will be able to differentiate, select proper electrodes, shielding gases, and properly adjust parameters. Emphasis is placed on axial spray, pulse spray and short circuit mode of transfer depending on base metal. Upon completion of this course, the student will be able to weld in all positions, read some basic weld symbols, and have a basic understanding of written welding procedures.

10-621-125 FCAW Techniques (2 cr.)
A study and operation of primarily flux cored arc welding. The student will learn about the different types of electrodes, fluxes and shielding gases used in these processes. Students will be able to weld in all positions, read some basic weld symbols, and have a basic understanding of written welding procedures.

10-621-126 GTAW Techniques (2 cr.)
A study and operation of primarily gas tungsten arc welding on some mild steel, with the majority of work on stainless steel and aluminum. The student will learn about the different types of electrodes and shielding gases used in these processes. Students will be able to weld in all positions, read some basic weld symbols, and have a basic understanding of written welding procedures.

10-621-133 Welding BPR & Symbols (2 cr.)
Provides practice in reading blueprints. Topics include orthographic projection, auxiliary views, revolved sections, surface and centerline relationships, scale drawing and tolerances. The student interprets detailed weld symbols using the American Welding Society standard. The course culminates with each student developing a detail drawing on the CAD system complete with weld symbols.
10-621-150 Electrical Theory & Maintenance for Welders (3 cr.)
Covers electrical theory of electrical circuits and components. Students will use this knowledge to design and build relay ladder logic and programmable logic circuits to simulate an automated welding cell. Emphasis is on electrical safety and the use of safety devices in a welding cell. Students will also use their acquired electrical theory knowledge to troubleshoot welding power sources and accessories. Maintenance and care of equipment will be stressed. This knowledge will enable the student to reduce or eliminate future downtime caused by lack of maintenance and failure.

623 Industrial Engineering

10-623-100 Fundamentals of SPC (2 cr.)
Introduces basic statistical tools and fundamental concepts needed to improve and control processes. Topics include the definition of statistics, the meaning of statistical process control, defining problems and setting priorities, predicting outcomes and estimating populations, and determining the causes of quality problems.

10-623-102 Engineering Internship - 2 Cr (2 cr.)
Incorporates having the student work on a special project in an engineering office at a local employer. The position will provide support to the project and provide a final report on the project status or completion. The student will be evaluated by the employer who will provide the final grade.

10-623-106 Interpretation of Engineering Drawings (2 cr.)
Teaches students how to visualize a three-dimensional part from a drawing, interpret dimensions and tolerances, identify symbols commonly used in engineering drawings, and use engineering drawings for comparison, analysis and problem-solving purposes. This is a self-paced, independent study course.

10-623-107 IE/ME-Work Measurement (3 cr.)
Helps the learner to develop skills in designing work stations, developing better work methods, establishing work standards, balancing assembly lines, and estimating labor costs. The time study techniques the learner will use include predetermined time standard systems, stopwatch, and work sampling. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-109 Introduction to Project Management (1 cr.)
Presents skills and information needed for project management, specifically how to get the job done on time and on budget. Topics include the project plan and organization, creating the project task network, managing resources, project tracking/monitoring/control, and project closedown and evaluation. This is a self-paced, independent study course.

10-623-110F Internal Auditing for ISO 9000 (3 cr.)
Covers the principles and practices of effective quality assurance auditing in accordance with ISO 9000 standards. Cases and examples using both manufacturing and service industry applications are presented. This is a self-paced, independent study course designed for students with previous knowledge of quality assurance.

10-623-110G Writing a Quality Manual (3 cr.)
Focuses on quality manuals, which are the compilation of documents that state a company’s policies and document the procedures to be used in its quality system. It is designed for students with previous knowledge of quality assurance. This is a self-paced, independent study course.

10-623-110H Intro. to Quality Functional Deployment (1 cr.)
Explains quality functional deployment, which stresses doing the right things correctly, beginning with the customer and ending with delivery and service of a product. Introduces the process of how QFD is used to translate requirements through planning matrices. This is a self-paced, independent study course.

10-623-110K Introduction to TQM (1 cr.)
Stresses the importance of having a business strategy driven by total quality management. Definitions and perspectives of the concept in manufacturing and service are evaluated, and the importance of quality from an economic and competitive viewpoint is presented. This is a self-paced, independent study course. After the first class session, students set their own attendance and study schedule.

10-623-110L Using Quality Tools (1 cr.)
Provides students with both knowledge and skill in the application of problem-solving and planning tools in an effort to achieve higher levels of quality and customer recognition. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.
10-623-111 IE/ME-Ergonomics & Workplace Safety (2 cr.)
Teaches students to be able to identify, analyze, and recommend improvements to work areas to minimize the opportunity for workplace injuries. They will become familiar with the ergonomics guidelines, analyze the costs and benefits of ergonomic improvements, and investigate accidents to identify possible causes or problem areas. This is a self-paced, independent study course. After the first class session, students set their own attendance and study schedule.

10-623-112 IE/ME-Facility Planning & Material Handling (3 cr.)
Provides the student with a practical means to use data to develop and improve plant and facility layouts and improve material handling methods that will yield higher production, lower costs, and/or improve the quality and customer service. This is a self-paced, independent study course. After the first class session, students set their own attendance and study schedule.

10-623-116 IE/ME-Fundamentals & Interactions (2 cr.)
Provides a broad, horizontal-based introduction to the activities of the IE/ME within the manufacturing environment, and the responsibilities, attitudes and skills needed by IEs/MEs in their interactions with the various intra- and inter-company departments throughout the process of bringing a product from concept to consumer. This is a self-paced, independent study course. After the first class session, students set their own attendance and study schedule.

10-623-122 MPC-Basics of Supply Chain Management (3 cr.)
Explores the basic concepts in managing the complete flow of materials in a supply chain along with a complete overview of material flow from internal and external suppliers to and from organizations. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-124 MPC-Detailed Scheduling & Planning (3 cr.)
Focuses on the various techniques for material and capacity scheduling including detailed descriptions of material requirements planning (MRP), capacity requirements planning (CRP), inventory management practices, and procurement and supplier training. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-125 MPC-Execution & Control of Operations (3 cr.)
Focuses on the areas of prioritizing and sequencing work, executing work plans and implementing controls, reporting activity results, and providing evaluating feedback on performance. The course explains techniques for scheduling and controlling production processes, the execution of quality initiatives and continuous improvement plans, and the control and handling of inventories. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-126 MPC-Strategic Management of Resources (3 cr.)
Studies the relationship of existing and emerging processes and technologies to manufacturing strategy and supply chain-related functions. Aligning resources with the strategic plan, configuring and integrating operating processes to support the strategic plan, and implementing change are covered. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-130 Product Lifecycle Management (PLM) Concepts & Applications (3 cr.)
Examines the leading-edge tools, technologies and best practices of Product Lifecycle Management (PLM) in an industrial enterprise. Current or aspiring engineering professionals gain an understanding of how PLM integrates people and processes across a company’s product lifecycle via authoring and visualization tools (traditional CAD/CAM/CAE), digital product definitions organized in a data vault, workflow management, rapid collaboration with innovation and configuration management. It explores the requirements, success factors and feasibility of PLM implementation or careers through development of a portfolio. Some familiarity with engineering practices and technologies is preferred.

10-623-137 ISO 9000, Introduction to (1 cr.)
Provides a basic explanation of ISO 9000. The rationale, standards and certification process are outlined. Topics include guidelines for quality management, production-oriented elements and the audit process. After the first session, students set their own attendance and study schedule.

10-623-137A Preparing for ISO Audit (1 cr.)
Builds on students’ knowledge of ISO 9000 and helps them prepare for an ISO registration audit. Topics include understanding the importance of ISO 9000 registration; how to locate, interview and select an ISO auditor; audit preparation; and the stages and measurement criteria involved in the audit process. This is a self-paced, independent study course.
10-623-138 Statistical Process Control, Introduction (1 cr.)
Introduces basic statistical tools and fundamental concepts needed to improve and control processes. Topics include defining problems and setting priorities, predicting outcomes and estimating populations, and determining the causes of quality problems. After the first session, students set their own attendance and study schedule.

10-623-139 Purchasing - Fundamentals (1 cr.)
Introduces the basic concepts and techniques of modern purchasing. This course is designed for students who plan to pursue the Purchasing and Procurement Technician specialization of the Applied Engineering Technology (AET) associate degree program. This is a self-paced, independent study course; after the first session, students set their own attendance and study schedule.

10-623-140 Purchasing - Supply Management Process (4 cr.)
Focuses on the purchasing process from the recognition of a need through contract closeout. Emphasis is on the four key areas of the purchasing process: identifying requirements, preparing solicitations, analyzing suppliers and executing a contract. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-141 Purchasing-Supply Mgmt Leadership Process (2 cr.)
Presents key general management issues specifically applied to purchasing activities such as strategic planning, the budgeting process, operating policies and procedures, tools to manage work flow, performance monitoring, and reporting of purchasing outcomes to upper management and peer groups. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-142 Purchasing - Supply Mgmt Environment (4 cr.)
Provides an overview of the purchasing department’s strategy and looks at how such trends as globalization, lean manufacturing, and customization affect purchasing. It also explores issues related to negotiations, quality, re-engineering, supply chain management and information technology. This is a self-paced, independent study course. After the first class session, students set their own attendance and study schedule.

10-623-143 Purchasing - Value Enhancement Strategies (4 cr.)
Explores a number of traditional and leading-edge approaches for increasing the purchasing department’s contributions to organizational success. Specific value enhancement methods such as standardization, value analysis, early supplier involvement and target costing are presented. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-144 IRM - Enterprise Concepts and Fundamentals (3 cr.)
Introduces the strategic fundamentals of the value-driven enterprise, the management concepts of organizational design and structure, the four basic functions of quality, human resources, finance and accounting, and information systems. This is a self-paced, independent study course.

10-623-145 IRM - Identifying and Creating Demand (3 cr.)
Examines the business processes that define the marketplace including strategies and tactics that identify, define and quantify customer wants and needs. This is a self-paced, independent study course. After the first class session, students set their own attendance and study schedule.

10-623-146 IRM - Designing Products and Processes (3 cr.)
Examines the systems, approaches and strategies used by an enterprise to convert a need or innovation into a product, process or service. Emphasis will be on identifying work to be done, anticipating output, doing the work and measuring the results. After the first session of this course, students set their own attendance and study schedule.

10-623-147 IRM - Delivering Products and Services (3 cr.)
Examines the methods that companies use to produce and deliver goods and services. Emphasis is on the integrated planning and control of resources and the business processes in the supply chain. Students also study the strategic value of ongoing support to the consumer. After the first session of this independent study course, students set their own schedule.

10-623-148 Manufacturing Processes (3 cr.)
Presents a comprehensive overview of the fundamental manufacturing process families. Learners focus first on how the processes move from a primary process of operation to the secondary process; then examine the tools and tooling used in manufacturing, forming, and casting techniques and their application, as well as material removal processes.
10-623-149 IE/ME-Fundamentals of Mfg Engineering (3 cr.)
Provides a broad overview to the activities of Manufacturing Engineering. Manufacturing Engineering was once thought of as converting raw material into product for profit; this course discusses selection of equipment, plant design, production control, operations planning and process analysis.

10-623-150 Quality Concepts (3 cr.)
Introduces ISO 9000, which is an international quality standard that helps define and document their own quality procedures for production and/or services. Learners will explore the path to an ISO quality system, including the benefits of an ISO quality system, documentation standards, project planning and quality policies.

10-623-158 Digital Fabrication (3 cr.)
Applies the lessons from the earlier courses. Students will develop a model of an approved layout. The layout will take into consideration the manufacturing materials and capability of the FabLab network. Lastly, the student will identify the current carbon footprint of a manufacturing site for the product selected.

10-623-162 QAT-Quality Concepts & Tools (3 cr.)
Focuses on the following body-of-knowledge topics: Quality Concepts-customers and suppliers, basic quality principles, quality standards, requirements, and specifications; Plan-Do-Check-Act (PDCA)-define and apply; Effective Team Function-conflict resolution, consensus, brainstorming, meeting management, stages of team development; 7 Quality Control Tools-cause and effect diagrams, flow charts (process maps), check sheets, Pareto diagrams, scatter diagrams, control charts, and histograms. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-163 QAT-Metrology (3 cr.)
Focuses on the science of weights and measures through description, selection and understanding of the use of, and evaluation of measurement results of: hand tools, gages, optical tools, coordinate measuring machines (CMM), electronic measuring equipment (e.g., digital displays and output), weights-balance-scales, hardness testing equipment, surface plate methods and equipment, surface analyzers (e.g., roughness profile), force measurement (e.g., tension, torque, compression), angle measurements (e.g., protractors, sine bar, angle blocks). This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-164 QAT-Calibration (1 cr.)
Focuses on Calibration Procedures, specifically: gage traceability, calibration status, the effect of calibration error on product acceptance, gage correlation, and reporting calibration discrepancies. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-165 QAT-Inspection & Testing (2 cr.)
Focuses on the following topics: Measurement Terms and Definitions; Geometric Dimensioning and Tolerancing (GD&T); Classification of Characteristics and Defects; Inspection Planning, Inspection Points; Inspection Techniques and Processes—nondestructive testing (NDT) techniques, accuracy and precision (reproducibility and repeatability), rounding rules, inspection error, gage selection, types of measurements, measurement scales, product traceability; and, sampling. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-166 QAT-Quality Audits (2 cr.)
Teaches students to use Auditing Techniques to identify the basic components of an industrial audit including preparation, performance, record keeping, and closure. They will be able to describe and apply various auditing tools and techniques such as checklists, interview techniques, record/document review, and tracing. And, also use Audit Types to define and use basic audit descriptors such as internal, external, system, product, and process. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-167 QAT-Preventive & Corrective Action (2 cr.)
Teaches students to use Continuous Improvement Techniques to determine and select areas for improvement using various quality tools; Nonconforming Material Identification to determine conformance status and apply various methods of identifying and segregating nonconforming material; Nonconforming Material Review Process to explain the purpose of the material review process and identify the steps in making decisions about fitness-for-use and product disposition; and, Investigation of Root Causes to distinguish between actual and apparent root causes using basic and sophisticated quality tools. This is a self-paced, independent study course. After the first session students set their own attendance and study schedule.
10-623-168 QAT-Statistical Techniques (2 cr.)
Focuses on the following body-of-knowledge topics: Basic Statistics, Objectives of Statistical Quality Control, Elementary Concepts of Probability, Frequency Distributions, Statistical Inference, and Control Charts. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-170 Intro to Lean Manufacturing (2 cr.)
Examines the principles of lean manufacturing, value versus non-value added activities, waste, 5S, value stream mapping, set-up reduction, cellular flow, building a lean culture, total productive maintenance, pull Kanban systems and value/supply chain management. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-172 Introduction to Supply Chain Management (2 cr.)
Introduces the key concepts of supply chain management. Learn tips, techniques and best practices in supply chain operations. Students will stay up to date on the newest thinking, strategies, developments and technologies in supply chain management. This in an independent study course.

10-623-174 Industrial Problem Solving (2 cr.)
Examines a variety of manufacturing scenarios posed as problems and uses the scientific method of identifying root causes and common analysis and solution tools to generate change. The philosophy, theory, and why major companies (GE, Honeywell, Motorola, etc.) use and are advocates of Six Sigma will also be presented. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-177 Industrial Standards & Regulations (1 cr.)
Focuses on providing an overview of the state and federal standards and regulations that govern workplace safety, in particular, OSHA. Emphasis is placed on locating standards in the Code of Regulations, applying safety and environmental standards to the factory, and interpreting material safety data sheets (MSDS). From this base of knowledge, the learner will be able to recognize hazards and determine the standards and regulations that apply to an actual work site. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-178 MPC-Master Planning of Resources (3 cr.)
Explores the processes used to develop sales and operations plans and identify and assess internal and external demand and forecasting requirements. The course focuses on the importance of producing achievable master schedules that are consistent with business policies, objectives and resource constraints. This is a self-paced, independent study course. After the first session, students set their own attendance and study schedule.

10-623-179 Construction/Engineering Productivity (2 cr.)
Introduces the student to the concepts of productivity as they apply to engineering. The student will review the methods for tracking and identifying production shortfalls. Also, the student will develop a detailed project schedule and track a fictional site through the process.

10-623-185 Independent Project Application (1 cr.)
Will have the students develop a job application packet. The packet will be a compilation of the work completed during the degree coursework. It will include a resume and cover letter describing the student and the materials. The final product will be submitted in a binder appropriate to give to a potential employer.

10-623-186 IE/ME-Intro to Engineering Economy (2 cr.)
Introduces the basic concepts and techniques of engineering economy. Profits don’t just happen, they are planned. Introduction to Engineering Economy is planning for profit and budgetary control. Major course topics include basic accounting concepts, cost estimating and budgeting.

10-623-194 Introduction to Six Sigma (3 cr.)
Explores the basic concepts needed to implement a Six Sigma approach in an organization. Major course topics include Six Sigma definition; impact of quality on cost, project selection, and definition; and process performance measures and Six Sigma roles.

10-623-195 Lean Tools (2 cr.)
Introduces useful tools to use when implementing Lean in your organization. Major course topics include team building, lean tools and project management. It is highly recommended that students take Intro to Lean Manufacturing (10-623-170) before taking this course.

10-623-196 Statistics for Six Sigma (3 cr.)
Covers a variety of tools needed in the measure, analyze and control phases of Define, Measure, Analyze, Improve and Control (DMAIC). Confidence intervals, hypothesis testing, statistical inferences and measurement system analysis are examples.
10-623-197 Advanced Statistical Tools for Six Sigma (3 cr.)
Covers a variety of tools needed in the analyze and improve phases of Define, Measure, Analyze, Improve and Control (DMAIC). Design of experiments, regression analysis and design for Six Sigma are examples.

10-623-198 Lean Six Sigma Project Application (4 cr.)
Covers the final phase of Six Sigma green belt certification. The project must demonstrate the mastery of all phases of the Define, Measure, Analyze, Improve and Control (DMAIC) process and completion of a project in the workplace.

628 Automated Manufacturing

10-628-107 ControlLogix 1 (1 cr.)
Covers the fundamentals of ControlLogix addressing and ladder logic programming. Projects, tasks and routine organization will be examined. ControlLogix hardware, including I/O, communication and special purpose modules will be examined. Students will also learn to write and document ladder ControlLogix programs.

10-628-112 Robotics (2 cr.)
Establishes a firm foundation in industrial robotics. The major electronics and mechanics of common robots are studied. Robot types, typical applications and end-of-arm tooling is presented as well as the programming of pick and place servo robots.

10-628-113 Electronic Construction Applications (1 cr.)
Demonstrates how to lay out, install and mount industrial electronic equipment on electrical panels. Students create wiring diagrams of each electronic device and eventually wire all devices in a cabinet. Quality workmanship and craftsmanship are emphasized.

10-628-117 ControlLogix 2 (1 cr.)
Covers ladder logic and structured text languages. Students will develop programs in each language and create programs that integrate ladder logic and structured text. Students will develop programs in the sequential function chart language as well as programs that integrate ladder logic, structured text and sequential function chart.

10-628-123 Controls and PLCs (2 cr.)
Covers the fundamentals of programmable logic controllers (PLCs). This course emphasizes programming, I/O modules, wiring, digital sensors, troubleshooting and operation of PLCs. Students also learn about networking PLCs.

10-628-124 Industrial Electronics (2 cr.)
Emphasizes the application of solid-state devices to industrial applications. Semiconductor theory is followed by diodes, transistors, thyristors and op-amps. Thermistors, photosensitive devices and hall effect is included. Solid-state devices applied to power switching is emphasized. Transistor amplifiers and op-amps are applied to drives, servos, sensors and I/O.

10-628-126 Blueprint Reading, Computer-Assisted Design (2 cr.)
Focuses on the symbols used on industrial blueprints and introduces computer-assisted design (CAD). Students examine the basic principles, use and application of CAD.

10-628-127 ControlLogix 3 (1 cr.)
Covers function block programming. Students will develop programs in function block language. Students will also develop programs that integrate all of the ControlLogix languages.

10-628-131 Instrumentation and Process Control (3 cr.)
Examines servo and process control with an emphasis in instrumentation. Students learn to control temperature, level, flow, position and velocity, as well as PID tuning and calibration of systems. The basics of statistical process control are emphasized. Students develop programs and perform control, tuning and calibration.

10-628-132 Controls and PLCs 2 (2 cr.)
Focuses on advanced programming of PLCs as well as analog I/O. Step logic, used to control motor position and control, and vision system programming are covered. Students develop and troubleshoot several vision applications involving inspection of lettering, size, location and electronic circuitry.

10-628-133 Visual BASIC for Industrial Applications (2 cr.)
Introduces computer programming using the Microsoft Visual Basic program. Students design and construct industrial VB programs that are used in industrial applications.

10-628-134 Industrial Automation Internship (3 cr.)
An elective credit earned by working in related technologies in industry. Work experience must show diversity in duties and learning opportunities and must relate directly to program content. Prior approval of instructor is required.

10-628-135 Visual Basic Industrial Advanced (2 cr.)
Introduces participants to sequential access files, array's, structures, functions, sub procedures and industrial programming.
Course Descriptions

10-628-136 Automated Systems Design (2 cr.)
Provides the student with the parameters under which a system must function. Based upon these parameters, the student will design, build and test a system to satisfy the requirements.

10-628-137 ControlLogix 4 (1 cr.)
Emphasizes motion control programming with ControlLogix's motion control. Students will develop programs for motion control applications using function block languages, as well as all of the ControlLogix languages. Students will develop a motion control program for a 2-axis machine.

10-628-138 Operator Input/Output (1 cr.)
Focuses on programming and integrating color touch screens for I/O and operator information and control. Rockwell Automation SLC's and color touch panels are used.

10-628-141 Cell Integration (3 cr.)
Focuses on integration of a complete manufacturing cell. Typical components include programmable controllers, robot, sensors, drives, conveyors, pneumatics, hard automation, control wiring and vision. Students plan, wire, program, troubleshoot and develop documentation for the whole system.

10-628-142 Elements of Machines (2 cr.)
Emphasizes the mechanical elements of industrial machines. Principles of power transmission, belt drives, pipefitting, seals, bearings, couplings and fasteners are covered. Terminology, selection and proper installation and maintenance are stressed.

10-628-143 Enterprise Integration (2 cr.)
Covers enterprise integration and communication. Students learn control and communication networks such as Ethernet, DeviceNet and ControlNet. Students integrate an enterprise from the plant floor devices to the business systems. Wonderware Intouch and RSView are used to develop SCADA applications that utilize SQL into the business systems. Students develop graphical operator, maintenance and management information, and I/O screens.

10-628-144 Electrical Power Systems (2 cr.)
Requires students to work with industrial power distribution systems. This course focuses on in-plant distribution of single- and three-phase systems as applied to automated manufacturing systems. Safe working practices are stressed.

10-628-179 Industrial Networking & Cabling (1 cr.)
Introduces the basics of networking hardware, such as routers and hubs, as well as industrial cabling. Students will gain an understanding of how information is routed from user to user. Protocols, IP's and network configurations are also covered. Students will learn the properties of cabling and assemble telecommunications cables.

660 Electronics Foundation

10-660-110 DC Circuits 1 (1 cr.)
Introduces electrical safety and program procedures. The course covers Ohm's Law, power law, series circuits, and voltmeter, ammeter and ohmmeter applications. Number powers, electronic notations, circuit component recognition and diagrams, resistor power ratings, color code, Kirchhoff's voltage law and atomic structure are also included.

10-660-111 DC Circuits 2 (1 cr.)
Covers basic parallel and series/parallel circuits and their properties. Magnetism and devices such as relays and solenoids are also presented. Laboratory activities are performed to verify the theory.

10-660-114 AC Circuits 1 (1 cr.)
Covers AC waveforms and different voltage values including Peak, RMS, Average and Peak to Peak. The operations of inductors, capacitors, time constants and transformers are included. Laboratory activities using the oscilloscope are performed to verify the theory.

10-660-115 AC Circuits 2 (1 cr.)
Covers reactive properties of series and parallel RC, RL and RLC circuits. Topics include reactance, phase angle and fundamental AC power concepts such as power triangle and power factor. Circuit quantities are determined using triangular analysis. Laboratory activities are performed to verify the theory.

10-660-120 Solid State 1 (1 cr.)
Introduces semiconductor materials, the operation of diodes, Zener diodes and the construction of rectifier and filter circuits. Laboratory experiments are performed to verify the theory.

10-660-121 Solid State 2 (1 cr.)
Examines the operation and theory of transistors and the construction of amplifiers. Laboratory experiments are performed to verify the theory.
10-660-126 Electronic Power Devices (1 cr.)
Provides the opportunity to experiment with power control devices used in the electronics industry today. Students discover how these semiconductor switches (from MOSFET to IGBT and SCR to TRIAC) are used in everything from a hand drill to an electric car. They will learn about component operation, device characteristics and safe troubleshooting techniques in the lab environment.

10-660-130 Digital Electronics Tech 1 (1 cr.)
Introduces digital electronics, the operation of logic gates, and the theory of combination logic devices such as encoders, decoders, multiplexers, binary adders and parity circuits. Laboratory activities are performed to verify the theory.

10-660-131 Digital Electronics Tech 2 (1 cr.)
Examines flip-flops, various types of shift registers and counters, arithmetic circuits, and practical application digital devices. Laboratory activities are performed to verify the theory.

10-660-180 Computer Hardware & Assembly (1 cr.)
Introduces hardware components located on the inside of a computer. Students develop an understanding of how the components relate to each other. They will assemble a PC and install necessary drivers and operating system to make the PC operational.

10-660-181 Technical Software Essentials (1 cr.)
Covers Microsoft related software. This will include word processing with Microsoft Word, spreadsheets with Microsoft Excel, presentation software with Microsoft PowerPoint and databases with Microsoft Access.

10-660-182 Operating Systems (1 cr.)

10-660-187 Logic & Semiconductor Concepts (1 cr.)
Emphasizes two fundamental areas of electronics. One is Logic Concepts, including numbering systems, gates, flip-flops, counter, timers and encoders. The other is Semiconductor Concepts, including PN junction principles, diodes, rectifiers, transistors and amplifiers. The emphasis is on component operation, device characteristics and troubleshooting techniques. Lab work culminates with three larger circuits, a timer driven counter with display, a complete DC power supply and an audio amplifier circuit.

10-660-188 Intro to Electronic Careers (3 cr.)
Provides an overview of the different careers available in the electronic-related fields. FVTC program offerings that support these types of careers are covered, as well as an introduction to some of the topics required to be successful in these electronic-related fields.

10-660-189 Electronic Applications (3 cr.)
Provides a hands-on opportunity to work with some of the topics required to be successful in electronic-related fields.

662 Electrical Engineering Technology

10-662-112 Advanced Circuit Analysis 1 (3 cr.)
Explores ideal transformers, mesh and nodal analysis, Thévenin’s and Norton’s theorems, power transfer and delta-wye. Laboratory experiments illustrate the principles presented and computer software is used in report preparation.

10-662-124 Advanced Circuit Analysis 2 (3 cr.)
Focuses on circuit analysis with frequency as a variable, Bode plots of circuit responses, resonant circuits, semiconductors, various pn junction diodes and diode circuit applications. Laboratory activities are performed to verify the theory.

663 Computer Control Engineering Technology

10-663-100 A+ Essentials Certification (2 cr.)
Prepares students for the A+ Essentials test covering the following areas of knowledge: installation, configuring and upgrading, diagnosis and troubleshooting, preventive maintenance, motherboard, processors and memory, printers, basic networking, networks and professionalism.

10-663-101 A+ IT Technologies Certification (2 cr.)
Prepares students for the A+ IT Technologies test covering the following areas of knowledge: installation, configuring and upgrading, diagnosis and troubleshooting, preventive maintenance, motherboard, processors and memory, printers, basic networking, OS fundamentals, security, system management and networks.
10-663-102 Engineering Tech Network+ Certification Prep (2 cr.)
Helps students develop a strong skill set pertaining to network topics commonly found in industry, along with an understanding of implementing them. Successful completion should prepare individuals to pass Network+ certification tests. Network+ certification validates your technical abilities in networking administration and support. It focuses on your knowledge of media and topologies, protocols and standards, network implementation, and network support. Network+ is designed to measure the equivalent of nine months of network administration and support experience.

10-663-103 Engineering Tech Security+ Certification Prep (3 cr.)
Helps students to develop a strong skill set pertaining to network topics commonly found in industry, along with an understanding of implementing them. Network security concerns will be addressed. Successful completion should prepare individuals to pass Security+ certification tests. The CompTIA Security+ certification tests for security knowledge mastery of an individual with two years on-the-job experience, with emphasis on security. The exam covers industry-wide topics, including communication security, infrastructure security, cryptography, access control, authentication, external attack, and operational and organization security.

10-663-104 Network Devices, Operation & Applications for Engineering Techs (4 cr.)
Helps students develop a strong skill set pertaining to network topics commonly found in industry, along with an understanding of implementing them. This course prepares individuals to install, configure and operate LAN, WAN and dial access services for small networks (100 nodes or fewer), including but limited to use of these protocols: IP, IGRP, Serial, Frame Relay, IP RIP, VLANs, RIP, Ethernet, Access Lists. Students are also prepared for the Cisco Certified Network Associates or CCNA certified professionals test.

10-663-111 Electrical System Components & Protection (4 cr.)
Studies the electrical systems from the main generator through the switchyard including the various relay and protection schemes and zones. Safety aspects and operational checks in regards to placing electrical systems and components in and out of service will also be covered.

10-663-112 Energy Sources & Conversion (2 cr.)
Studies the various forms of energy and the processes used to convert chemical and potential energy into thermal, mechanical, and in some instances, electrical energy. Energy sources that will be studied include fossil fuels (coal, oil and natural gas), hydro, wind, fuel cells, solar, derived fuel, geothermal and nuclear. Combustion and reaction will be discussed in detail for those energy sources that require combustion to convert from one energy form to another.

10-663-113 Gas Turbines & Combined Cycle Ops (4 cr.)
Studies all the elements that make up a gas turbine and a combined cycle unit. This course also covers the safe and efficient operation of gas turbines and heat recovery steam generators and their different applications as used in combined cycle and cogeneration configurations.

10-663-114 Introduction to the Electric Industry (3 cr.)
Provides students with an overview of the electrical power industry, including its history, development and regulatory environment. Students will learn about the transmission of electricity and the development of regional and national energy grids, including changes in the regulation of the power industry.

10-663-115 P & ID Diagrams (1 cr.)
Covers schematics, prints, piping and instrument diagrams used in the energy industry. Students will learn how to interpret simple block and single-line diagrams, which will prepare them for the logic and electrical schematics included in this course.

10-663-116 Plant Operations & Troubleshooting (3 cr.)
Provides students with the knowledge necessary to comprehend overall power plant operations and respond to abnormal operating conditions. Students will also participate in root cause analysis exercises while troubleshooting different operating scenarios.

10-663-117 Power Generation (2 cr.)
Studies the design and construction of large industrial generators used in the production of electricity. Students will study the various exciter designs and operation, and various auxiliary equipment that supports generator operation.

10-663-118 Power Plant Equipment (3 cr.)
Covers the various types of equipment used in the production of electricity, including pumps, valves, air compressors, coal pulverizers, fans, cooling towers, condensers and heat exchangers. Students will also study some basic power plant systems and learn where certain types of equipment are used and why.
10-663-119 Power Plant Practical (2 cr.)
Involves students’ participation in hands-on lab activities, internships or job shadowing to gain entry-level job competencies.

10-663-120 Voice, Data, and Video Comm (2 cr.)
Covers telecommunication transmission methods used in the cable industry, telephone industry and data communications field. An overview of the individual areas will be presented and then pulled together in the makeup of a comprehensive system incorporating all of the above aspects in telecommunications. Transmission techniques, cabling methods, proper cable termination and testing will be introduced.

10-663-121 Communication Signals 2 (1 cr.)
Covers the communication signals used in the Telecommunications industry. Signal analysis will be covered on voice, data, radio frequency, video and fiber communication systems. Theory and transmission mediums will be covered in order for the students to better understand signal transmission concepts. Methods for signal testing and troubleshooting will be covered.

10-663-122 Communication Signals (1 cr.)
Covers the basics on communication signals used in the Telecommunications industry. Signal analysis will be covered on voice, data, RF and video signals in order for the students to better understand signal transmission concepts. Methods for signal use and display will be covered.

10-663-124 Fiber-Optic Theory & Installations (2 cr.)
Takes an in-depth look into the makeup of signals run over fiber-optic installations. Photonic, signal paths, transmission methods, and telecommunication trunks, Passive Optical Networks (PON), with an emphasis on inside plant installations, will be covered. Course content will focus on commercial, industrial and small business applications. Concepts on Fiber to the Home (FTTH) and Fiber to the Desktop (FTTD) and outside plant installations will also be covered.

10-663-125 Telecommunication Systems (2 cr.)
Covers telecommunication transmission methods used in the cable industry, telephone industry and data communications field. An overview of the individual areas will be presented and then pulled together in the makeup of a comprehensive system incorporating all of the above aspects in telecommunications. Transmission techniques, cabling methods, proper cable termination and testing will be introduced.

10-663-126 Home Wiring & Termination Practices (3 cr.)
Covers safety, installation tools, cables, connectors and methods for installing cables into residential dwellings. Customer service concepts will also be covered. Both aerial and underground installation practices will be covered. A heavy emphasis on hands-on applications will be presented.

10-663-127 Telephone & Data Networking 2 (2 cr.)
Covers the development of telephone and data infrastructures used in residential and small business applications. Cabling specifications, installation, grounding and bonding, and troubleshooting methods will be covered so the student understands the theory of operation and maintenance of telephone and data network services. Course content will focus on residential, commercial, and industrial installations and applications.

10-663-128 Telephone and Data Networking (2 cr.)
Covers the development of telephone infrastructures used in residential and small business applications. Cabling specifications, installation and testing methods will be covered so the student understands the theory of operation and maintenance of telephone service. Course content will focus on residential and small business installation and applications.

10-663-129 Home Display Systems (1 cr.)
Covers the methods for installation and troubleshooting of home theater systems and Internet access. Cabling specifications, installation and testing methods will be covered so the student understands the theory of operation and installation practices. Course content will focus on residential installations.

10-663-130 Steam Turbines & Auxiliaries (3 cr.)
Covers basic steam turbine construction and design and associated auxiliary systems. Students will learn how thermal energy is converted to mechanical energy as the steam passes through a typical industry steam turbine. Students will also study the auxiliary systems associated with steam turbine operation, including extraction steam systems, gland steam sealing systems, turbine lube oil systems, seal oil systems, instrumentation and control devices, and protective schemes used during abnormal operating conditions. Steam turbine start-up and shut-down procedures will also be studied.

10-663-131 Water Purification & Treatment (2 cr.)
Covers industrial water treatment processes. Students will study boiler water treatment, raw water treatment, and the design and operation of ion exchangers. The course also covers cooling water treatment equipment and waste water treatment equipment and systems.
10-663-132 Auxiliary Systems & Refrigeration (3 cr.)
Provides a comprehensive study of industrial manufacturing plant auxiliary systems, including fluid power, piping and piping systems, pumps and pump drive systems, compressors and fan systems, refrigeration, and hydraulic systems, but not restricted to these components. This course will introduce students to the operation, design and maintenance of auxiliary systems equipment.

10-663-133 Distillation & Refinery Operations (4 cr.)
Provides a comprehensive study of processes associated with refining and petrochemical distillation. This course will also focus on equipment designs, operation requirements and technician responsibilities associated with the operation of typical distillation facilities.

10-663-134 Ethanol & Bio-fuels Production (4 cr.)
Studies the design, operation, equipment and process flows of ethanol plants and biofuels facilities, including biodiesel plants. The student will have the ability to interpret basic flow diagrams and understand related terminology. The equipment design and operation used in these facilities will be a focus, as well as safety considerations, typical maintenance and startup/shutdown procedures.

10-663-135 Gas Processing (3 cr.)
Provides a comprehensive study of the processing technologies associated with the production of natural gas and other gases found within natural gas fields. Students will study gas laws, molecular structure, process theory, terminology, equipment and the auxiliary systems which support the production and processing of gases.

10-663-136 Hydrocarbon Chemistry (3 cr.)
Provides a fundamental study of the organic chemistry of hydrocarbons associated with crude oil. This course will also focus on process chemistry, chemistry fundamentals, typical process reactions and process solubility theory.

10-663-137 Voice/Data/RF Signal Analysis (2 cr.)
Delves deeper into the makeup of various telecommunications signals including voice, data, video and RF signals. Specifications, installation and testing methods will be covered so the student understands the theory of operation and maintenance. Course content will focus on residential and small business applications.

10-663-138 Introduction to Process Technology (3 cr.)
Designed to provide an introduction to process plant operations including ethanol plants, chemical and refinery plants, natural gas facilities, gasification operations, combined cycle and food processing operations. Student is required to complete a tour of a process facility during this course. Equipment overviews and the initiation/maintenance of a career portfolio are components of this course.

10-663-139 Process Equipment (3 cr.)
Designed to provide the basic operating principles of equipment used in the process technology industry such as valves, piping, pumps, compressors, generators, motors, lubrication systems, heat exchangers, furnaces, boilers, cooling towers, separators, reactors and distillation columns. The mechanical design characteristics, scientific principles and the interactions of the various pieces of plant equipment will be explored.

10-663-141 Supervisory Control & Data Acquisition 1 (2 cr.)
A capstone course using embedded controller, DAQ and SCADA knowledge acquired from previous courses. Students work in small teams to complete tasks for larger projects. Advanced DAQ, DDC, SCADA and interactive remote network and single point access topics are included. Students should have completed or take 10-605-143 Embedded Controllers concurrently.

10-663-143 LabVIEW Intermediate (1 cr.)
Continuation of 10-605-142, LabVIEW and DAQ. Topics covered include string manipulation, application control, state machines, exception handling, shared variables, .Net, ActiveX, and COM, multithreading and object oriented programming in LabVIEW. This course will be project-based.

10-663-145 LabVIEW for Communications (1 cr.)
Focuses on communication topics utilizing LabVIEW as the programming tool. Topics covered include serial, Data Socket, UDP, TCP, Internet and common wireless protocol-based device usage. This course will be project based.

10-663-146 Supervisory Control & Data Acquisition 2 (1 cr.)
A continuation of Supervisory Control & Data Acquisition 1. Advanced data acquisition, direct digital control and typical data sharing networking applications are covered. Topics include recipes, trending of historical data, bridging data and WEB enabled applications.

10-663-149 CET Project (2 cr.)
Utilizes previous course skills to implement capstone projects.
10-663-150 Voice over Internet Protocol (VoIP) (1 cr.)
Introduces the student to the selection, installation, configuration, security, troubleshooting, theory of operation and maintenance of Voice over Internet Protocol (VoIP) in residential and small business applications.

10-663-151 Home Security & Access Control (2 cr.)
Provides the knowledge and skills necessary to understand and use the systems that are used in modern homes to secure the premises, provide access control, and monitor interior and exterior locations with cameras.

10-663-154 Hybrid Electric Vehicle Technology (2 cr.)
Provides foundational information about vehicles that use more than one propulsion technology to power a drive system. This course covers the different configurations and vehicle platforms, the operation of various systems, and the technologies involved, and the maintenance of hybrid electric vehicles. Required safety precautions used when working around high-voltage systems, especially in emergencies, are highlighted.

10-663-155 Photovoltaic Systems Overview (2 cr.)
Introduces the student to the principle of operation, components, configurations, applications and various types of photovoltaic systems.

10-663-156 Energy Storage Devices (1 cr.)
Provides an overview of energy storage devices to include theory of operation, applications, and pros and cons of each technology.

10-663-157 Power Conversion Technologies (2 cr.)
Provides an overview of power conversion technology and devices as it is applied to renewable and alternative energy systems. Theory of operation, applications, and pros and cons of each technology are covered.

10-663-158 Wind Power Engineering Technology (2 cr.)
Provides an introduction to the devices and components used to generate electrical power from a wind turbine. Theory of operation and application of the devices and components are covered, as well as overall system operation.

10-663-159 Photovoltaic Engineering Technology (2 cr.)
Provides an introduction to the devices and components used to generate electrical power from a photovoltaic system. Theory of operation and application of the devices and components are covered, as well as overall system operation.

10-663-160 HVAC Heating, Ventilating and Air Conditioning (3 cr.)
Covers all aspects of residential and commercial HVAC systems. Topics included are specifically designed for HVAC and building maintenance technicians. This course includes an introduction to HVAC fundamentals, types of HVAC units, load calculations, residential and commercial controls, with maintenance, troubleshooting, and servicing procedures. The main focus of the course is on HVAC unit operation, HVAC unit mechanical, electrical, and pneumatic systems, and the safety practices required to work on HVAC units and systems.

10-663-161 HVAC Control Systems (3 cr.)
Covers all aspects of HVAC control systems used in industry. Topics included are specifically designed for HVAC and building maintenance technicians. This course provides an introduction to HVAC fundamentals, energy sources and control principles. Pneumatic, electromechanical, and electronic components and control systems are covered. The course also covers the latest technology in energy efficiency practices, building automation systems, networking, direct digital control, building automation system retrofitting, maintenance management and troubleshooting principles.

10-663-163 Instrumentation (3 cr.)
Provides an overview of the latest information on measurement devices and instrumentation. Fundamental theory and operating principles of instrumentation in industry are covered. Common applications used in control of manufacturing and other processes are used as examples throughout the course. This course also covers industrial communications from traditional pneumatic to state-of-the-art digital and wireless communication systems including Fieldbus, Hart and Ethernet. Also covered are safety systems that address common safety devices and systems such as relief valves, rupture discs, burner control systems, hazardous location classifications, enclosures and safety instrumented systems (SIS).

10-663-164 Low Pressure Boilers (2 cr.)
Includes coverage of personal protective equipment, burner control systems, steam principles, emission analysis and control, cooling systems including refrigeration principles and equipment, chilled water systems, and refrigerant recovery procedures. This course covers all aspects of low pressure boilers, featuring ASME Code requirements, smoke-control procedures, boiler fittings, feedwater, steam, combustion, boiler operations and water treatment. Boiler licensing preparation is also included. This course is a must for operators of boiler systems used in hotels, apartment buildings, schools and other large institutions.
10-663-165 High Pressure Boilers (2 cr.)
Includes the latest information on safe and efficient operation of high pressure boilers and related equipment. The content and format of the course are specifically designed for use in preparation for obtaining a boiler operator’s license. The latest combustion control technology and EPA regulations and their implications are covered in this course. All aspects of high pressure boilers are covered, including steam boiler operations, fittings, boiler operation safety, combustion and computer-assisted combustion controls, boiler water treatment, and licensing.

10-663-167 Process Control Infrastructure (2 cr.)
Covers a broad variety of sensor and transducer operation and utilization. Signal conditioning and connection configurations are studied and applied. Actuators used in typical industrial-related processes are covered, including operation, connection and configuration. Operation and application of electronic instrumentation, measurement devices and methods of measurements—pressure, force, temperature, etc. are also covered. Principles of open and closed loop control systems are applied, including an introduction to PID control terminology and techniques. Lab activities enforce theory.

10-663-168 Instrumentation & Control Theory (2 cr.)
Covers computer-based data acquisition and process control using graphical development environment: interfacing techniques include analog and digital input/output, counter/timer applications and data communication methods. Lab activities enforce theory.

10-663-169 HVAC Control Devices & Apps (3 cr.)
Building automation systems operate cooperatively to share building information and control system devices automatically according to programmed logic. This course covers the operation, signals and functions of the sensors, actuators and other control equipment used in automated systems in commercial buildings. The course is organized by building system and each system is explained so that the function and application of each device is clear.

10-663-170 HVAC System Open Protocols (3 cr.)
Builds upon the foundation of control device knowledge covered in HVAC Control Devices and Apps. This course introduces concepts of automated electronic controls and network communication and then details the two primary protocols for wired networks—LonWorks and BACnet. Each system is thoroughly described with information about installation, configuration, operation, maintenance and troubleshooting.

10-663-171 Industrial Communication Protocols (1 cr.)
Exposes the student to a wide variety of different communication protocols and hardware connections typically found in industry. Students will gain an understanding of the differences between protocols and characteristics of them.

10-663-176 Enterprise Data Communication Applications (2 cr.)
A capstone course integrating communication between various enterprise levels. Students will focus on developing applications that support data exchange between discrete sensors, embedded controllers, programmable logic and automation controllers, personal computers and servers. Both local and remote data exchange is supported. OPC, Web Serving and other communication technologies are incorporated. This course utilizes visual, graphical and structured programming languages to develop application specific programs. Typical projects will include devices programmed with a structured language communicating with a device programmed with a graphical or visual language.

10-663-177 Process Operations and Troubleshooting (3 cr.)
Designed to provide instruction in the different types of troubleshooting techniques, procedures and methods used to solve process problems. Students will use existing knowledge of equipment, systems and instrumentation to understand the operation of an entire unit in a facility. Students study concepts related to commissioning, normal startup, normal operations, normal shutdown, turnarounds and abnormal situations, as well as the Process Technician’s individual and team role in performing tasks associated with these concepts within an operating unit.

10-663-178 Process Plant Practical (2 cr.)
Covers student participation in hands-on lab activities, internships or industry job shadowing to gain entry-level job competencies.

10-663-179 Print Reading for Electrical Systems (2 cr.)
Provides a fundamental resource for learning and applying the print reading skills needed when installing, maintaining, and troubleshooting electrical systems and equipment. Examples of residential, commercial and industrial prints are used to highlight specific content.
10-663-180 Photonic Devices & Fiber Technical Aspects (2 cr.)
Covers operating characteristics and applications of photonic devices and fiber optics while holding the student to a high degree of technical awareness and understanding of the material covered. Due to the dynamic nature of this area, photonic devices which may be covered include optical transmitter and receiver devices, imaging devices and devices used in fiber optic applications. This course focuses on some of the topics covered in Photonic Devices & Fiber Optics (10-605-184), but to a deeper technical level.

10-663-181 Fiber Test Equipment & Systems (1 cr.)
Covers the operation and application of test equipment used in troubleshooting fiber and fiber systems. System and optical networking concepts, standards, single channel and optical networking design are also covered.

10-663-182 Global/Regional/Metro Telecomm-Fiber Based (1 cr.)
Covers technical aspects of global, regional and metro telecommunications applications, along with local telephone or access networks including fiber integration. Internet access and local-area networks are introduced.

10-663-183 Voice, Data, & RF Signal Analysis 2 (2 cr.)
Takes a more in-depth look into the makeup of various telecommunications signals including voice, data, video, RF and fiber signals. Signal specifications, transmission methods and telecommunications trunks will be covered. Course content will focus on commercial and small business applications.

699 Technical Communications

10-699-102 Intercultural Communication (3 cr.)
Sensitizes students to the needs and expectations of people of other cultures and introduces skills necessary for effective intercultural communication. Topics include appropriate verbal and nonverbal communication, written communication patterns, business and social etiquette, and intercultural negotiation strategies. Students will also examine universal systems, cultural values and problems associated with language diversity.

10-699-102DE Intercultural Communication (3 cr.)
Sensitizes students to the needs and expectations of people of other cultures and introduces skills necessary for effective intercultural communication. Topics include appropriate verbal and nonverbal communication, written communication patterns, business and social etiquette, and intercultural negotiation strategies. Students will also examine universal systems, cultural values and problems associated with language diversity.

10-699-104 Research Methods for Tech Communications (3 cr.)
Provides information about and practice in writing problem statements, planning research strategies, and using primary and secondary methods of research. It uses both traditional and web-based sources. APA and MLA documentation styles are reviewed and used for source citation purposes. Students will apply their research to problem-solving scenarios.

10-699-104DE Research Methods for Tech Communications (3 cr.)
Provides information about and practice in writing problem statements, planning research strategies, and using primary and secondary methods of research. It uses both traditional and web-based sources. APA and MLA documentation styles are reviewed and used for source citation purposes. Students will apply their research to problem-solving scenarios.

10-699-105 Writing Content for the Web (3 cr.)
Focuses on technical writing strategies for electronic messages and reports and provides exposure to strategies and methods of designing and writing for Web sites that support the workplace. Current trends in Search Engine Optimization (SEO) will be introduced.

10-699-105DE Writing Content for the Web (3 cr.)
Focuses on technical writing strategies for electronic messages and reports and provides exposure to strategies and methods of designing and writing for Web sites that support the workplace. Current trends in Search Engine Optimization (SEO) will be introduced.

10-699-106 Proposal/Grant Writing (3 cr.)
Introduces the skills to evaluate, assess and apply appropriate writing principles in writing grants and proposals. Students will complete this class with direct experience in writing a grant.

10-699-106DE Proposal/Grant Writing (3 cr.)
Introduces the skills to evaluate, assess and apply appropriate writing principles in writing grants and proposals. Students will complete this class with direct experience in writing a grant.
10-699-112 Introduction to Technical Communications (3 cr.)
Provides new students with firm knowledge of the Technical Communications program. Students will explore the careers associated with this field, learn how to put together a high-quality e-portfolio and work on improving technical writing skills. Technical editing and proofreading will be introduced in this course.

10-699-112DE Introduction to Technical Communications (3 cr.)
Provides new students with firm knowledge of the Technical Communications program. Students will explore the careers associated with this field, learn how to put together a high-quality e-portfolio and work on improving technical writing skills. Technical editing and proofreading will be introduced in this course.

10-699-116 Developing Product Documentation (3 cr.)
Focuses on the preparation of various types of manuals—procedural and instructional. Skills addressed include layout and design and project management. Both a theoretical and practical approach to instructional design will be presented. Proper usability principles are key in this class.

10-699-117 Designing Content for the Web (3 cr.)
Focuses on design and delivery of professional quality Web content. Students will learn to incorporate usability in Web page design, terminology, appropriate document file formats and incorporate optimized graphic images.

10-699-117DE Designing Content for the Web (3 cr.)
Focuses on design and delivery of professional quality Web content. Students will learn to incorporate usability in Web page design, terminology, appropriate document file formats and incorporate optimized graphic images.

10-699-120 Information Design (3 cr.)
Prepares students to design and manage information using a variety of methods—instructional design strategies, performance support system software and information systems theories. Students will be required to use project management techniques in order to create a simple training session for online delivery and develop a support system using RoboHelp.

10-699-121 Social Media (1 cr.)
Introduces social media, such as Facebook, Twitter, LinkedIn and other new media, as used by technical communicators. This 9-week course will stress how to integrate social media for business purposes and apply quality marketing/public relations strategies.

10-699-121DE Social Media (1 cr.)
Introduces social media, such as Facebook, Twitter, LinkedIn and other new media, as used by technical communicators. This 9-week course will stress how to integrate social media for business purposes and apply quality marketing/public relations strategies.

10-699-141 Technical Communications Internship (3 cr.)
Provides the fourth semester student with on-the-job experience related to technical communications. Students will be assigned appropriate workplace projects, will help design assessment criteria for the experience, and will be evaluated by the workplace mentors and the practicum instructor after completing a self-assessment of the work during this experience.

10-699-142 E-portfolio Assessment (1 cr.)
Focuses on the completion of an e-portfolio as a culminating assessment of student progress throughout the program. Students take away an electronic portfolio of their best work that they can use during their professional careers.

801 Communication Skills

10-801-136 English Composition 1 (3 cr.)
Designed for learners to develop knowledge and skills in all aspects of the writing process. Planning, organizing, writing, editing and revising are applied through a variety of activities. Students will analyze audience and purpose, use elements of research and format documents using standard guidelines. Individuals will develop critical reading skills through analysis of various written documents.

10-801-194 Oral Skills Development (1 cr.)
Focuses on interpersonal communication with emphasis on speaking and listening skills. Enables students to practice in group settings and as individuals.

10-801-195 Written Communication (3 cr.)
Teaches the writing process which includes prewriting, drafting and revising. Through writing assignments, students analyze audience and purpose, research and organize ideas, and format and design documents based on subject matter and content. Class sessions and assignments involve giving oral presentations and using computers.

10-801-196 Oral/Interpersonal Comm (3 cr.)
Focuses on developing various communication skills including speaking and listening. Students practice intrapersonal/interpersonal and nonverbal communication skills through oral presentations, group activities and written projects.
10-801-197 Technical Reporting (3 cr.)
Focuses on the preparation and presentation of a variety of oral and written technical reports. This course is designed as an advanced communication course for students who have completed at least the prerequisite writing course and a minimum of two semesters of relevant program course work.

10-801-198 Speech (3 cr.)
Covers the fundamentals of oral presentation, topic selection, audience analysis, speech organization, research, evidence and support, delivery, evaluation, listening and group problem solving.

31-801-318 Communication, Applied (2 cr.)
Focuses on technical vocabulary, business writing, job search strategies, interpersonal communication and oral presentation skills through individual and group activities. It is recommended that the student have basic computer skills, an ACCUPLACER Reading score of 54 or greater and an ACCUPLACER Sentence Skills score of 83 or greater or completion of equivalent Program Prep courses. Personal/professional development students who have not taken the ACCUPLACER test need to consult with their instructor during the first class.

804 Mathematics
10-804-106 Intro to College Math (3 cr.)
Covers the fundamental concepts of mathematics. The emphasis for this entry-level course is on computational and problem-solving skills. Topics include ratios, proportions, percentages, basic principles of algebra, computational geometry, graphing, statistics and measurement applications. Applied problems and calculator use are integrated throughout the course.

10-804-107 College Mathematics (3 cr.)
Designed to review and develop fundamental concepts of mathematics pertinent to the areas of arithmetic and algebra; geometry and trigonometry; and probability and statistics. Special emphasis is placed on problem solving, critical thinking and logical reasoning, making connections, and using calculators.

10-804-113 College Technical Math 1A (3 cr.)
Included topics are solving linear, quadratic, and rational equations; graphing; formula rearrangement; solving systems of equations; percent; proportions; and operations on polynomials. Emphasis will be on the application of skills to technical problems. Successful completion of College Technical Math 1A and College Technical Math 1B is the equivalent of College Technical Math 1.

10-804-114 College Technical Math 1B (2 cr.)
Continuation of College Technical Math 1A. Topics include measurement systems; computational geometry; right and oblique triangle trigonometry; and trigonometric functions on the unit circle. Emphasis will be on the application of skills to technical problems. Successful completion of College Technical Math 1A and College Technical Math 1B is the equivalent of College Technical Math 1.

10-804-115 College Technical Math 1 (5 cr.)
Includes solving linear, quadratic, and rational equations; graphing; formula rearrangement; solving systems of equations; percents; proportions; measurement systems; computational geometry; right and oblique triangle trigonometry; trigonometric functions on the unit circle; and operations on polynomials. Emphasis will be on the application of skills to technical problems. This course is the equivalent of successful completion of College Technical Math 1A and College Technical Math 1B.

10-804-116 College Technical Math 2 (4 cr.)
Included topics are vectors; trigonometric functions and their graphs; identities; exponential and logarithmic functions and equations; radical equations; equations with rational exponents; dimension of a circle; velocity; sine and cosine graphs; complex numbers in polar and rectangular form; trigonometric equations; conic sections; and analysis of statistical data. Emphasis will be on the application of skills to technical problems.

10-804-117 Math for Natural Resources Common Topics (2 cr.)
Includes real numbers, linear equations, rate, ratio, proportion, percent, measurement systems, computational geometry and right-triangle trigonometry. Emphasis is on applied problems from the field of natural resources (surveying, water treatment, forestry, plant and wildlife management).

10-804-123 Math w Business Apps (3 cr.)
Covers real numbers, basic operations, linear equations, proportions with one variable, percents, simple interest, compound interest, annuities, applying math concepts to the purchasing/buying process, applying math concepts to the selling process, and basic statistics with business/consumer applications.
**Course Descriptions**

10-804-124 Math for Laboratory Science (3 cr.)
Provides a basic math review of mathematical tools used in laboratory work including exponents, scientific notation, logarithms, units of measurement and equations including unit conversions. This course also provides instruction in the use of proportional relationships to solve a variety of practical laboratory calculation problems, dilution calculations used in chemical and microbiologic laboratory work and graphical methods of data analysis including linear and exponential relationships. This course also provides instruction in laboratory statistics including variance, standard deviation, coefficient of variation and methods of displaying statistical values.

10-804-181 Calculus 2 (4 cr.)
Develop techniques for differentiation and integration of transcendental functions. Use the derivative and the integral to solve certain applied problems. Extend calculus techniques to curves in polar coordinates and three-dimensional surfaces. Form basic understanding of infinite series and associated applications.

10-804-189 Introductory Statistics (3 cr.)
Teaches students to display data with graphics, describe distributions with numbers, perform correlation and regression analyses, and design experiments. Students use probability and distributions to make predictions, estimate parameters and test hypotheses. They also draw inferences about relationships including ANOVA.

10-804-198 Calculus 1 (4 cr.)
Focuses on analyzing and graphing algebraic expressions, especially conic sections. Students develop an intuitive understanding of limits, derivatives and integrals. They apply the derivative and the integral to certain physical problems.

31-804-307 Math for the Trades (2 cr.)
Focuses on the math skills needed for various trades. Topics include arithmetic fundamentals, percent and proportion applications, the metric system, conversions, practical geometry, measurement applications, signed numbers and formula evaluation. Micrometer, equation solving and standard rule measurement units are included as needed. Scientific calculator use is introduced as needed.

31-804-308 Industrial Maintenance Math (2 cr.)
Focuses on a wide range of calculation skills using a scientific calculator with an algebraic-entry method. Topics include elementary calculator operations, scientific notation, formula evaluation, measurement systems, rules of estimation and right trigonometry.

806 Natural Science

10-806-103 Independent Study - Science Department (1 cr.)
Provides individually designed course work to upgrade transfer credit and student skills equal to FVTC courses. The student receives a timeline, topics, assignments and assessment strategies from a faculty member. The instructor and the student sign the agreed upon course document. This course requires approval from the dean for credit.

10-806-105 Principles of Animal Biology (4 cr.)
Focuses on general biological principles, cell structure and function, genetics, comparative anatomy and physiology, evolution, and ecosystems. Includes dissection of various fresh and preserved materials. This course is appropriate for AODA students.

10-806-112 Principles of Sustainability (3 cr.)
Prepares the student to develop sustainable literacy; analyze interconnections between physical and biological science, and environmental systems; summarize the effects of sustainability; analyze connections among social, economic and environmental systems; employ energy conservation strategies to reduce use of fossil fuels; investigate alternative energy option; evaluate options for waste disposal and recycling; and analyze approaches used to promote and implement sustainability.

10-806-114 General Biology (4 cr.)
Introduces general biological concepts and principles. Emphasis is on cell structure and function, genetics, evolution and taxonomical relationships. Consideration is also given to diversity among the various kingdoms. This course emphasizes an environmental perspective and is suitable for students in Natural Resources, Early Childhood Education and others interested in environmental biology. High school biology or consent of instructor is required.

10-806-134 General Chemistry (4 cr.)
Covers inorganic chemistry and basic organic chemistry. Topics include metrics, problem solving, atomic structure, chemical reactions, solutions and concentrations, ionization, pH and organic compounds.

10-806-143 College Physics 1 (3 cr.)
Presents the applications and theory of basic physics principles. This course emphasizes problem solving, laboratory investigation and applications. Topics include laboratory safety, unit conversion and analysis, kinematics, dynamics, work, energy, power, temperature and heat.
10-806-144 College Physics 2 (3 cr.)
Presents the applications and theory of basic physics principles. This course emphasizes problem solving, laboratory investigation and applications. Topics include periodic motion, wave motion, optics, magnetism, static electricity, DC electricity, AC electricity and electromagnetism.

10-806-154 General Physics 1 (4 cr.)
Presents the application and theory of basic physics principles. This course emphasizes problem-solving, laboratory investigation and applications. Topics include unit conversion and analysis, vectors, translational and rotational kinematics, translational and rotational dynamics, heat and temperature, and harmonic motion and waves.

10-806-175 Science Principles for Transportation (3 cr.)
Introduces the physics principles involved with technical measurement, force application, fluid properties, heat and electricity. Emphasizes problem-solving skills, teamwork and the application of scientific principles in the transportation industry.

10-806-176 DNA Science (4 cr.)
Includes instruction in DNA structure and function as well as application of DNA science to laboratory testing. Students will learn the basic tools and techniques used in the DNA laboratory including DNA restriction analysis, purification and identification of DNA and basic PCR techniques used in many laboratories.

10-806-177 Gen Anatomy & Physiology (4 cr.)
Examines basic concepts of human anatomy and physiology as they relate to health sciences. Using a body systems approach, the course emphasizes the interrelationships between structure and function at the gross and microscopic levels of organization of the entire human body. It is intended to prepare health care professionals who need to apply basic concepts of whole body anatomy and physiology to informed decision-making and professional communication with colleagues and patients. (This course also provides the foundation, and is prerequisite to, Advanced Anatomy and Physiology.)

10-806-179 Adv Anatomy & Physiology (4 cr.)
Examines human anatomy and physiology using a body systems approach with emphasis on interrelationships between form and function at the gross and microscopic levels of organization. Lab experimentation includes analysis of cellular metabolism and individual components of body systems (nervous, neuro-muscular, cardiovascular, and urinary). Continued examination of homeostatic mechanisms and their relationship to fluid, electrolyte, acid-base balance and blood; and integration of genetics to human reproduction and development are also included in this course.

10-806-186 Intro to Biochemistry (4 cr.)
Provides students with skills and knowledge of organic and biological chemistry necessary for application within Nursing and other Allied Health careers. Emphasis is on recognizing the structure, physical properties and chemical reactions of organic molecules, body fluids, and acids. Additional emphasis is placed on biological functions and their relationships to enzymes, proteins, lipids, carbohydrates and DNA.

10-806-197 Microbiology (4 cr.)
Examines microbial structure, metabolism, genetics, growth, and the relationship between humans and microorganisms. Addresses disease production, epidemiology, host defense mechanisms and the medical impact of microbes. Examines the role of microbes in the environment, industry and biotechnology. Students have the following flexible lecture options: in-class, Webcast, podcast or Interactive Television.

31-806-300 Chemistry, Applied - Flexographic (2 cr.)
Examines chemical principles that relate to the process of flexography. Topics include general organic and inorganic chemistry as well as descriptive chemistry for inks, substrates, plates and photographic processing.

809 Social Science

10-809-103 Think Critically & Creatively (3 cr.)
Provides instruction in the vital, realistic and practical methods of thinking which are in high demand in all occupations of substance today. Decision making, problem solving, detailed analysis of ideas, troubleshooting, argumentation, persuasion, creativity, setting goals and objectives, and more are considered in-depth as the student applies specific thinking strategies and tools to situations in a wide variety of workplace, personal, academic and cultural situations.
10-809-110 Leadership as an Art (3 cr.)
Focuses on the development of leadership abilities. Students create a personal philosophy of leadership and discuss moral and ethical responsibilities. Through study and observation of great leaders plus hands-on activities, students develop fundamental concepts of leadership.

10-809-122 Intro to Amer Government (3 cr.)
Introduces American political processes and institutions. Focuses on rights and responsibilities of citizens and the process of participatory democracy. Learners examine the complexity of the separation of powers and checks and balances. Explores the role of the media, interest groups, political parties and public opinion in the political process. Also explores the role of the state and national government in our federal system.

10-809-159 Abnormal Psychology (3 cr.)
Focuses on a broad description of psychological disorders such as psychosis, neurosis and personality problems. It is geared toward an understanding of the deeper level forces and adjustment problems that create mental and emotional stress. Students prepare to recognize and deal with persons with mental dysfunctions.

10-809-166 Intro to Ethics: Theory & App (3 cr.)
Provides a basic understanding of ethical theories and uses diverse ethical perspectives to analyze and compare relevant issues. Students will critically evaluate individual, social and/or professional standards of behavior and apply a systematic decision-making process to these situations.

10-809-172 Race Ethnic & Diversity (3 cr.)
Develops workplace skills needed to work with diverse groups of people. Ethnic relations are studied in global and comparative perspectives. Students examine their biases and gain awareness of differences and common ground shared. The course emphasizes how personal and cultural diversity enhances the effectiveness of work groups.

10-809-188 Developmental Psychology (3 cr.)
Studies human development across the lifespan from conception through old age and death. It focuses on the physical, intellectual, social, emotional and moral development of a person and presents the normal range of responses, reactions and behaviors of age-related development. It also helps students to distinguish what might be considered dysfunctional.

10-809-195 Economics (3 cr.)
Provides a foundation of economic concepts and institutions so that students can apply economic thinking to their own decisions as consumers, employees and citizens in a market-oriented economic system. Topics include supply and demand, employment, prices and production, fiscal policy, monetary policy, market structures, and international trade and finance.

10-809-196 Intro to Sociology (3 cr.)
Focuses on the basic concepts of the intercultural discipline of sociology. Emphasis is placed on culture, socialization and social stratification. The course also looks at five institutions: family, politics, economics, religion and education. Additional topics include demography, deviance, technology, environmental social issues, and social change and organization.

10-809-197 Contemporary Amer Society (3 cr.)
Analyzes public policy issues relating to government, media, education, family and the workplace. This course also looks at the impact of global, multicultural and technological trends on American life and explores these issues by using critical thinking skills, advocating points of view, and participating in political processes.

10-809-198 Intro to Psychology (3 cr.)
Focuses on the theoretical foundation of human functioning and looks at learning, motivation, emotions, personality, deviance and pathology, physiological factors and social influences. Students consider the complexities of human relationships in personal, social and vocational settings.

10-809-199 Psychology of Human Relations (3 cr.)
Explores the relationship between the general principles of psychology and people's everyday lives. Students seek a deepened sense of awareness of themselves and others, and to improve their relationships at work, in the family and in society.

31-809-300 Human Relations (2 cr.)
Explores practical applications of issues in psychology and human behavior that affect a person's daily life. The objective is to enhance the student's quality of life by developing an awareness of the connection between his/her personal life and work life. This course is intended for technical diploma students.
31-809-303 Fundamentals of Ethics (2 cr.)
Provides a basic understanding of ethical theories and uses diverse ethical perspectives to analyze and compare relevant issues. Students will critically evaluate individual, social and/or professional standards of behavior and apply a systematic decision-making process to these situations.

890 General Studies-Survival Skill

10-890-100 College Success 1 (1 cr.)
Encourages students to explore and develop the skills, attitudes and habits leading to academic success. Topics include study skills such as memory devices, test-taking and note-taking; personal development skills including learning style and time management, and orientation to FVTC services and resources.

10-890-103 Employability Strategies (1 cr.)
Designed to ease the student’s transition from school to the world of work. The strategies of getting a job and the interpersonal skills needed in keeping it are emphasized. Topics include the job search, employment correspondence, application for employment and job interviewing. These topics are enhanced by mock interviews, individualized job search planning and employment advising, and presentations from human resource personnel.

10-890-110C College and Career Success (2 cr.)
Participants examine career options, develop academic and career goals, and learn specific skills to enhance their success in meeting their professional and personal goals. Topics include personal and academic assessments, determining career fits, and personal development skills including learning styles, time management, test-taking, how to access academic resources, and goal setting.

10-890-110DE College and Career Success (2 cr.)
Participants examine career options, develop academic and career goals, and learn specific skills to enhance their success in meeting their professional and personal goals. Topics include personal and academic assessments, determining career fits, and personal development skills including learning styles, time management, test-taking, how to access academic resources, and goal setting.

31-890-307 Workplace Reality (2 cr.)
Focuses on developing skills in interpersonal communication, teamwork and meeting practical workplace requirements. Topics include quality control, team building, statistical process control, report writing, interview and report writing skills, diversity, problem solving, conflict resolution and OSHA requirements.