

## Chapter Five • Course Descriptions

# Degree & Certificate Course Descriptions

	CREDITS		CREDITS		CREDITS
<b>ACCOUNTING</b>					
<b>ACCT&amp; 201 Principles of Accounting I</b>	5	<b>ACCT 225 Federal Income Tax</b>	5	<b>ADMINISTRATIVE MEDICAL ASSISTANT</b>	
Prerequisite: MATH 092 Elementary Algebra or MATH 096 Business Math II		Prerequisite: ACCT& 201 Principles of Accounting I		<b>AMA 110 Computer Basics</b>	1
An introduction to the concepts and methods underlying the preparation of corporate financial statements using generally accepted accounting principles. Topics covered include the accounting cycle, cash, and receivables.		An introduction to federal income tax for individuals including current tax law, preparation of individual income tax form 1040 and related schedules.		This course will provide the basic vocabulary and terminology related to computer and word processing applications. An introduction to computer hardware and software is provided. This course will help build confidence and skills in using computer technology.	
<b>ACCT&amp; 202 Principles of Accounting II</b>	5	<b>ACCT 230 Governmental Accounting</b>	5	<b>AMA 111 Introduction to Word Processing</b>	3
Prerequisite: ACCT& 201 Principles of Accounting I		Prerequisite: ACCT& 201 Principles of Accounting I		This course is an introduction to the basic concepts of MS Word. The components that will be covered are document creation, editing and saving, formatting text and paragraphs, working with tables, columns and other formatting features. Graphics, WordArt, charts, text flow document templates. Advanced features including mail merge, macros, document versioning and proofing tools.	
A continuation of the concepts and methods underlying the preparation of corporate financial statements using generally accepted accounting principles. Topics covered include long-term assets, liabilities, stockholders' equity, statement of cash flows and financial statement analysis.		An introduction to the accounting and reporting requirements for governmental and non-profit entities. Covers the essentials of fund accounting and applies techniques to transactions in governmental units including governmental fund types, proprietary fund types, and fiduciary fund types.		<b>AMA 112 Fundamentals of Medical Terminology</b>	4
<b>ACCT&amp; 203 Principles of Accounting III</b>	5	<b>ACCT 235 Intermediate Accounting Topics</b>	5	This course is an introduction to the first of a series of medical terminology courses associated with anatomy and understanding of disease. Students learn basic prefixes, suffixes, combining forms, and medical abbreviations.	
Prerequisite: ACCT& 201 Principles of Accounting I and MATH 098 Intermediate Algebra or MATH 172 Applied Business Math		Prerequisite: ACCT& 201 Principles of Accounting I		<b>AMA 113 Business Communications</b>	5
An introduction to the concepts and methods of managerial accounting and how accounting information is essential for management decisions. Topics covered include job costing, activity based costing, inventory management, cost - volume - profit relationships, budgets, short-term business decisions and capital investment decisions.		Provides an in-depth study of financial accounting theory and practice. Primary focus is on financial statement preparation for small to medium-sized domestic companies. Topics include revenue recognition and income determination, financial statement preparation and account reconciliation and analysis.		This course will provide instruction in communication skills needed in the business/medical environment. Course content will include writing letters, memos, reports, resumes, and electronic messages. Emphasis will be placed on delivering oral presentations and developing interpersonal skills. Critical thinking and problem solving skills are emphasized. Development of these skills is integrated with the use of technology.	
<b>ACCT 205 Excel for Accounting</b>	5			<b>AMA 114 Introduction to the Health Care Profession</b>	5
Prerequisite: ACCT& 201 Principles of Accounting I and INFO 101 Computer Application Essentials				This course is an introduction to the basic concepts of the administrative medical assistant profession with emphasis on professional behaviors as they relate to the patient-physician-medical assistant relationship.	
Use Excel to create accounting models which focus on solving accounting problems and completing accounting projects. Learn practical application for concepts emphasized in financial accounting and managerial accounting.				<b>AMA 115 Digital Medical Transcription</b>	3
<b>ACCT 207 QuickBooks</b>	5			Students are introduced to the processes used to transcribe a variety of medical correspondence and reports with emphasis on the development of proofreading and editing skills. Digital media is introduced.	
Prerequisite: ACCT& 201 Principles of Accounting I				<b>AMA 116 Medical Office Procedures</b>	3
Learn hands-on experience and practice in computerized accounting applications (QuickBooks) for small businesses. Use the general ledger, accounts payable, accounts receivable, inventory, invoicing, and payroll modules.				Students complete practical applications related to a variety of administrative medical tasks to include appointment scheduling, internet research, referral process for treatment, and records management.	
<b>ACCT 220 Payroll Accounting</b>	5				
A comprehensive study of payroll concepts including compute wages and salaries, withholding for social security and income taxes and unemployment compensation taxes, maintain payroll records and prepare the relevant tax forms.					

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<b>AMA 117 Beginning Medical Terminology</b> 4 Students learn medical terminology with an emphasis on the integumentary, musculoskeletal, nervous, cardiovascular, and respiratory systems. Prerequisite required: ADMA 102	
<b>AMA 118 Administrative Medical Concepts</b> 4 Students are provided an introduction to the general duties of the medical assistant in the health care setting: ethical and legal issues, telephone and electronic communication use, and computer use in the medical office. Prerequisite required: ADMA 101	
<b>AMA 119 Advanced Medical Office Procedures</b> 3 Students complete practical applications related to a variety of administrative medical tasks to include: generation of reports, creating CMS-1500 forms for billing, editing drafts of documents, message taking, completing incident report, and preparing orders for supplies. Prerequisite required: ADMA 101 AND ADMA 104	
<b>AMA 120 Introduction to Spreadsheets</b> 3 This course is an introduction to the basic concepts of MS Excel. Performing basic calculations using formulas, formatting and printing worksheets, create powerful charts and graphs.	
<b>AMA 121 Intermediate Medical Terminology</b> 4 Students learn medical terminology with an emphasis on the digestive, urinary, female and male reproductive, and blood systems. Prerequisite required: ADMA 102	
<b>AMA 122 Intermediate Administrative Medical Concepts</b> 4 Students are provided training in the areas of patient reception, appointment scheduling, written communication, mail processing, handling medical records, and filing (electronic). Prerequisite required: ADMA 101, ADMA 102, AND ADMA 105	
<b>AMA 123 Electronic Health Records</b> 4 Students expand their medical transcription knowledge by getting exposure and hands-on experience with electronic documentation. Students will learn medical documentation guidelines in electronic format and how to manage and process medical data. HITECH and Meaningful Use standards will be featured. Prerequisite required: ADMA 102 AND ADMA 103	
<b>AMA 124 First Aid/CPR</b> 1 Learn how to provide immediate care in cardiac, breathing and first aid emergencies until advanced medical personnel arrive. Students will receive FA/CPR/AED certification that meets OSHA standards.	

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<b>AMA 125 Practice Management System Applications</b> 2 Students learn to use a medical practice management data base and practice a variety of record maintenance functions common to a medical facility: scheduling, billing, account balancing, and financial report analysis. Students are provided a hands-on approach utilizing practice management software. Prerequisite required: ADMA 101 AND ADMA 105	
<b>AMA 126 Advanced Administrative Medical Concepts</b> 4 Students are introduced to administrative skills relating to: health information management, privacy issues (HIPAA), professional fees, banking procedures, and medical practice finances. Prerequisite required: ADMA 101, ADMA 105, AND ADMA 109	
<b>AMA 127 Medical Insurance</b> 4 Students learn medical insurance terminology and processes for billing a variety of insurance types. They learn specifics of Medicaid, Medicare, Tricare, Workers Comp, and managed care.. Secondary insurance billing requirement, rebilling, and electronic billing are also included. Prerequisite required: ADMA 101 AND ADMA 105	
<b>AMA 128 Advanced Medical Terminology</b> 4 Students learn medical terminology with an emphasis on the sense organs, endocrine, lymph and immune systems, and radiology, pharmacology, and mental health. Prerequisite required: ADMA 102	
<b>AMA 129 Medical Coding Applications</b> 4 This course is an introduction to the coding of diagnoses and procedures of health care records with emphasis on coding for insurance reimbursement. Students learn to use both CPT and ICD-9-CM/ICD-10-CM classification manuals and reference materials. Prerequisite required: ADMA 102 AND either ADMA 106, ADMA 110, or ADMA 114	
<b>AMA 130 Medical Office Supervision and Management</b> 3 This course will focus on developing practical skills in managing people and issues of supervision. Components will consist of building effective work teams, communication skills for supervisors, conflict resolution, managing change, and supervision principles in the healthcare setting.	
<b>AMA 131 Interview Techniques</b> 3 Students will discuss different types of interview formats, brainstorm interview questions and answers, participate in mock interviews, learn how to handle unexpected interview situations. Resume development will be discussed.	

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<b>AMA 132 Phlebotomy</b> 3 Students learn to draw and process blood specimens for analysis.	
<b>AMA 133 HIV Prevention Education</b> 1 This course meets Washington State Department of Health objectives for the four- and seven-hour HIV/ Bloodborne Pathogens education requirement for credentialed healthcare providers and non-credentialed healthcare facility employees.	
<b>AMA 134 Healthcare Credentialing</b> 2 This course is an introduction to the necessary components of healthcare credentialing. State, Federal, and administrative requirements are addressed. Guest speakers from local area healthcare facilities will provide additional training.	
<b>AMA 135 Practical Applications</b> 3 This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. This project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>AMA 296 Work-based Learning Experience</b> 3 Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>AMA 297 Work-based Learning Seminar</b> 2 Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>AMA 298 Work-based Learning – No Seminar</b> 1 This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

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**ADMINISTRATIVE OFFICE ASSISTANT**

**AOA 101 Professional Communications 1**  
Students learn verbal and written communication skills that are required within the business and office environment.

**AOA 102 Professional Office Procedures 5**  
This course is an introduction to duties and responsibilities found within the office administrative professions including the investigation of career paths, the development of career goals, and the exploration of customer service philosophies.

**AOA 103 Telecommunications 1**  
Skills related to customer service, arrangement of business travel, operation of multi-line phone systems and facsimile equipment are introduced.

**AOA 105 Keyboarding I 5**  
This course is an introduction to basic typewriting and computer keypad data entry skills.

**AOA 106 MS Windows 1**  
This course is an introduction to MS Windows where students learn to identify computer system components, use Windows software, and manage digital files.

**AOA 107 MS Outlook 4**  
Students learn to manage calendars and utilize basic and advanced features of email systems.

**AOA 108 Records Management 4**  
Students learn to perform records management activities at the level required within the administrative office assistant industry.

**AOA 109 Business Ethics 2**  
Concept of ethics and its role in business are presented with emphasis on the examination of ethical situation and the creation of steps to solve the issue.

**AOA 110 MS Word I 5**  
This course is an introduction to basic word processing skills using MS Word.

**AOA 111 MS Outlook 2**  
Students learn to manage calendars and utilize basic and advanced features of email systems.

**AOA 112 Business Grammar I 1**  
This course is an introduction to basic grammar including identifying parts of speech and writing grammatically correct sentences.

**AOA 121 MS Word II 3**  
A continuation of the concepts introduced in AOA 110, students learn more advanced word processing skills.

**AOA 123 Business Documentation 5**  
Written communication skills required within the business and office environment are developed.

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**AOA 124 Business Presentations 3**  
Business meeting structure, conduct, and protocols, including meeting facilitator's responsibilities are emphasized.

**AOA 126 Business Grammar II 2**  
This course is an introduction to basic grammar including identifying parts of speech and writing grammatically correct sentences.

**AOA 132 Business Grammar III 1**  
This course is an introduction to grammar including identifying parts of speech and writing grammatically correct sentences at the intermediate level.

**AOA 202 Accounting Software 3**  
Students learn to use commercially available accounting software packages such as Quickbooks or timeslips to maintain books and business records.

**AOA 203 MS Excel I 3**  
Students learn to create, edit, maintain, and print spreadsheets and data sheets and create and edit macros.

**AOA 204 MS PowerPoint 3**  
This course is an introduction to presentation software that is used to create computer-based based slide shows.

**AOA 205 MS Access I 3**  
This course is an introduction to Microsoft Access with emphasis on the acquisition of database maintenance skills.

**AOA 206 Voice Recognition Software 2**  
This course is an introduction to voice recognition software with emphasis on the skills required to use this software for word processing purposes.

**AOA 207 Business Grammar IV 1**  
This course is an introduction to grammar including identifying parts of speech and writing grammatically correct sentences at the intermediate level.

**AOA 217 Business Grammar V 1**  
This course is an introduction to grammar including identifying parts of speech and writing grammatically correct sentences at the advanced level.

**AOA 223 MS Excel II 3**  
Students learn advanced functions such as graphing, working with multiple spreadsheets, and formatting and printing spreadsheets and data sheets.

**AOA 224 Desktop Publishing 3**  
Students are introduced to popular desktop publishing software such as MS Publisher and MS FrontPage and acquire desktop publishing skills.

**AOA 225 MS Access II 3**  
Students learn to design and create databases to meet data collection and reporting requirements normally associated with business operations.

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**AOA 234 Employment Preparation 1**  
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.

**AOA 240 Capstone Project 2**  
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**AOA 291 Practical Applications 1-18**  
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AOA 292 Independent Projects 1-5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AOA 296 Work-Based Learning Experience 1**  
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**AOA 297 Work-Based Learning Seminar 1**  
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**AOA 298 Work-Based Learning Experience – No Seminar 2**  
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

	CREDITS		CREDITS		CREDITS
<b>ARCHITECTURAL WOODWORKING/ CABINET MAKING TECHNOLOGY</b>					
<b>ARWC 101 Introduction to Cabinetmaking</b>	3	<b>ARWC 108 Portable Power Tools</b>	3	<b>ARWC 114 Cabinetmaking/32mm System</b>	3
This course is an introduction to the basic fundamentals of the cabinetmaking trade including sources and products of cabinetmaking and different occupational opportunities.		This course is an introduction to the proper use, maintenance, and application of portable power tools. Common tool use and care of router and bits, the different types of routers and their application, biscuit cutter, pocket hole jigs, drills and drivers, and various joint-making tools and their set-up.		Students acquire knowledge and skills in the use and application of the 32mm cabinet system. This includes the construction methods, materials, hardware, and assembly of frameless cabinets.	
<b>ARWC 102 Safety Principles</b>	4	<b>ARWC 109 Hand Tools</b>	3	<b>ARWC 115 Finishing Methods I</b>	3
This course is an introduction to the required safety and shop rules to be applied in the lab as well as the OSHA and WISHA rules and regulations that help maintain a safe and productive work environment.		This course is an introduction to the proper use, maintenance, and application of hand tools used for the cutting/milling, assembly, and installation of cabinets, woodworking parts, templates, and projects. Common hands tools include the block plane; measuring and marking tools; and cutting tools such as dovetail saws, back saws, and Japanese saws.		Students are introduced to the use and application of finishes used in a shop setting including a variety of techniques: wipe-on, spray, and brushing.	
<b>ARWC 103 Cabinetry Blueprints/Plans</b>	4	<b>ARWC 110 Basic Cabinet Joinery</b>	4	<b>ARWC 116 Drawers and Doors</b>	2
An introduction to the fundamental skills of show drawings and detail plans, students learn to read and interpret plans including material and cabinet take-offs. Basic sketching is also introduced.		Students learn the proper use and application of joints used in the assembly and production of cabinets. Emphasis is on function, strength, ease of machining, and basic uses of various joints. Their application and suitability to different materials and production settings is also introduced.		Students learn to assemble doors and drawers and design and manufacture different door/drawer styles to assigned/personal projects.	
<b>ARWC 104 Materials</b>	2	<b>ARWC 111 Tool Maintenance/Sharpening</b>	3	<b>ARWC 117 Laminates / Countertops / Solid Surface</b>	3
This course is an introduction to the materials used in the cabinetmaking trade including both natural-made and man-made materials: MDF, particle board, laminates, veneers, solid surfaces, and sustainable sourced woods.		This course is an introduction to the maintenance and sharpening of tools used in the shop including routine maintenance and minor tool repair/adjustments. Routine maintenance will be covered as well as some minor tool repair and adjustments. Students use assigned/instructor approved projects to replace knives, adjust cutting performance, and maintain machines.		Students are introduced to the fabrication and assembly methods of various countertop materials including plastic laminates and solid surface materials.	
<b>ARWC 105 Machine Tools I</b>	4	<b>ARWC 112 Cabinetmaking/ Face I Frame Construction</b>	4	<b>ARWC 118 Occupational Math</b>	3
This course is an introduction to the proper use, maintenance and application of basic machines used for the building of cabinets and woodworking projects. Basic machines may include the jointer, planer, radial arm saw, wide belt sander, table saw, vertical panel saw, line boring machine, motorized miter saw, and drill presses.		Students learn to cut, assemble, and complete traditional face frame cabinets. Design, layout and proper material use will be covered. Design, layout, and proper material use is introduced as well as carcass assembly, face frames and door and drawer construction.		This course is an introduction to mathematical computations as they relate to the architectural woodworking/cabinetry industry. Applied skills include material estimation and board, square, and linear footage calculations.	
<b>ARWC 106 Machine Tools II</b>	4	<b>ARWC 113 Cabinetmaking/ Face II Frame Construction</b>	4	<b>ARWC 119 Jigs and Fixtures</b>	2
A continuation of the concepts introduced in ARWC 105, students learn the proper use, maintenance, and application of complex machine tools used for the building of cabinets and woodworking projects. Advanced machines may include edge banders, sliding table/table saw, spindle shapers, panel raising attachment, panel router, Euro hinge machines similar to Blum Mini press, and the hollow chisel mortiser.		A continuation of the concepts introduced in ARWC 112, students learn to cut, assemble, and complete traditional face frame cabinets. Design, layout, and proper material use is introduced as well as carcass assembly, face frames and door and drawer construction. Students are assigned instructor-approved projects to develop more advanced knowledge and skills.		This course is an introduction to the use of jigs, templates, and fixture for doing machining processes when more than one part is required to be identical or parts need to be held for machining. Skills taught include material selection, measurements, and proper tooling and ease of use. Work is on shop projects and simulated mockups.	
<b>ARWC 107 Machine Tools \CNC</b>	3	<b>ARWC 120 Cabinetmaking/ Commercial Construction</b>	3	<b>ARWC 121 Applied Communications</b>	3
This course is an introduction to the proper use, maintenance, and application of CNC machining used for the cutting/milling of cabinets, woodworking parts, templates, and projects. The use of basic layouts on the computer and software used for this application is emphasized.		Students learn to assemble commercial casework including assembly methods, construction standards, and materials.		This course is an introduction to written communication skills and their application to professional-technical studies. Development of writing skills necessary to write technically formatted documents is emphasized.	
		<b>ARWC 201 Wood Bending/ Lamination Techniques</b>	3		
		Students learn wood bending/laminating techniques including vacuum bagging and lamination bending. Types of forms, construction of forms, adhesives, and best materials for bending are included.			

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<b>ARWC 202 Architectural Millwork</b>	<b>3</b>
Students learn architectural millwork fabrication and design methods using projects and mockups. Molding selection, machining, material selection, and cutting are also included.	
<b>ARWC 203 Beginning Furniture Projects</b>	<b>5</b>
Furniture design, styles and assembly methods are taught.	
<b>ARWC 204 Cabinet Installation- Residential/Commercial</b>	<b>4</b>
Students learn to install residential and commercial cabinets and fixtures. Layout, leveling, and fastening methods are also taught.	
<b>ARWC 205 Advanced Joinery</b>	<b>4</b>
The selection and proper use of tools and materials in the creation of advanced joinery are emphasized.	
<b>ARWC 206 Cabinetmaking Computer Technology</b>	<b>4</b>
This course is an introduction to the use of various industry software for design, layout, and manufacture of cabinets.	
<b>ARWC 207 Veneering Technology</b>	<b>2</b>
Students learn to use a variety of methods of applying, fitting, and trimming veneers.	
<b>ARWC 208 Employment Preparation</b>	<b>3</b>
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.	
<b>ARWC 209 Advanced Projects</b>	<b>1-18</b>
With instructor approval, students select and complete an advanced project.	
<b>ARCH 213 Practical Applications</b>	<b>3</b>
Students explore individual topics in depth relating to concepts introduced in previous coursework.	
<b>ARWC 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ARWC 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	

	CREDITS
<b>ARWC 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ARWC 295 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ARWC 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>ARWC 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>ARWC 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

CREDITS

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<b>AUTO BODY REBUILDING &amp; REFINISHING</b>					
<b>AUTOB 101 Auto Body Math Applications</b>	3	<b>AUTOB 110 Window Mechanisms</b>	4	<b>AUTOB 204 Unibody Alignment</b>	5
This course is an introduction to mathematical theory and its application to the automotive refinishing industry. Topics include an overview of general mathematical concepts and how they are successfully utilized in practical situations.		Students learn to install mechanical and power window mechanisms. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.		Students learn the basic theory and application of major unibody and frame repair. Topics include methods of inspection, types of measuring equipment, and identifying types of structural damage. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.	
<b>AUTOB 102 Safety Principles</b>	3	<b>AUTOB 111 Introduction to Surface Preparation</b>	2	<b>AUTOB 205 Body Over Frame Alignment</b>	4
This course is an introduction to the safety practices and procedures common to the automotive refinishing industry.		Basic principles of interior and exterior surface preparation are introduced. Students learn to analyze the components of primers, undercoats, and topcoats. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.		Students learn to measure, align, and repair a unibody and body over frame vehicle. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.	
<b>AUTOB 103 Materials Identification</b>	3	<b>AUTOB 112 Surface Preparation Applications</b>	5	<b>AUTOB 206 Glass Installation</b>	4
Students are introduced to the various types of automotive materials and finishes and the equipment used in their application. Emphasis is placed on identification of a variety of repair and refinishing materials, types of equipment, and proper safety precautions.		This course introduces students to methods of surface preparation for automotive refinishing. Topics include sanding techniques, metal treatment, selection and use of undercoats, and proper masking procedures. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.		This course is an introduction to glass installation methods with emphasis on the removal and replacement of structural glass, non-structural glass, and auto trim. Cleanup of vehicle interior after breakage is also included. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.	
<b>AUTOB 104 Minor Body Repair Methods</b>	5	<b>AUTOB 113 Advanced Surface Preparations</b>	5	<b>AUTOB 207 Introduction to Plastic Repair</b>	2
Students learn about materials used in minor body repair and how to use them to fill/smooth depressed areas in sheet metal. The removal and installation of bolt-on panels are also included. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.		A continuation of the concepts introduced in AUTOB 111 and 112, students continue to learned advanced surface preparation techniques to restore cars to factory standards after collision damage. Prerequisite: Successful completion of AUTOB 102, AUTOB 103 and AUTOB 112.		Students learn to identify the various types of plastics, their characteristics and locations, and which procedures to follow while repairing or refinishing the various types of plastics. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.	
<b>AUTOB 105 Major Panel Replacement</b>	5	<b>AUTOB 201 Topcoat Systems</b>	5	<b>AUTOB 208 Plastic Repair Methods</b>	5
Students learn the basic theory of major panel replacement and alignment/replacement methods, including welding. They are also introduced to automobile body construction types and their common mechanical components: energy absorbers, suspension and steering systems and CV joints. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.		Students are introduced to the basic principles of topcoat systems with emphasis on the types of automotive topcoat systems and their application procedures. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.		A continuation of the concepts introduced in AUTOB 207, students repair or refinish various plastic surfaces. Prerequisite: Successful completion of AUTOB 102, AUTOB 103 and AUTOB 207.	
<b>AUTOB 106 Alignment – Sheet Metal</b>	5	<b>AUTOB 202 Topcoat Systems Applications</b>	5	<b>AUTOB 209 Shop Management</b>	3
This course includes practical applications in the adjustment/alignment of bolt-on sheet metal doors, hoods, fenders, and trunk lids. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.		A continuation of the concepts introduced in AUTOB 201, students learn to apply a variety of automotive topcoats including single-stage, basecoat/clearcoat, and tri-coat finishes. Buffing, compounding, and detailing of newly painted vehicles for delivery is also presented. Prerequisite: Successful completion of AUTOB 102, AUTOB 103 and AUTOB 201.		Students are introduced to the basic principles of body shop management with emphasis on management structure, customer relations, and sound business practices. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.	
<b>AUTOB 107 Alignment – Bumpers</b>	3	<b>AUTOB 203 Shop Welding</b>	5	<b>AUTOB 210 Introduction to Estimating</b>	4
Students learn to align a variety of bumpers including impact-absorbing, fixed mounted and metal reinforced. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.		This course provides instruction in automotive metal inert gas (MIG) and oxyacetylene welding with emphasis on safety, set-up and operation of welding equipment. Students learn to successfully join automotive sheet metal using the MIG process. Prerequisite: Successful completion of AUTOB 102, AUTOB 103 and WBAS 101.		Students learn to estimate collision damage, auto body repair, and finishing costs. Traditional and computer-assisted methods used for determining cost involved in labor, parts, and materials are emphasized. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.	
<b>AUTOB 108 Alignment – Head Lamps</b>	1			<b>AUTOB 211 Special Projects</b>	4
Students learn to align various types of headlamps in automobiles. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.				This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.	
<b>AUTOB 109 Trim and Accessories</b>	3				
Students learn to replace trim molding, hardware, locks and latches and repair/replace window adjustment mechanisms and restraint devices. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.					

	CREDITS
<b>AUTOB 291 Practical Applications</b>	1-18
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>AUTOB 292 Independent Projects</b>	1-5
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>AUTOB 293 Independent Projects</b>	1-5
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>AUTOB 294 Independent Projects</b>	1-5
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>AUTOB 296 Work-based Learning Experience</b>	1-18
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>AUTOB 297 Work-based Learning Seminar</b>	1-2
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>AUTOB 298 Work-based Learning – No Seminar</b>	1-18
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

## AUTOMOTIVE TECHNOLOGY

	CREDITS
<b>AUTOM 101 Basic Engines</b>	4
Students are introduced to internal combustion engine theory, configuration operation and diagnosis.	
<b>AUTOM 102 Engine Systems</b>	4
Students are introduced to the operation and diagnosis of engine subassemblies such as valve trains, timing components and short blocks.	
<b>AUTOM 103 Basic Electrical Theory</b>	4
Students are introduced to electrical theory including ohms law, series and parallel circuits, and measuring devices.	
<b>AUTOM 105 Engines/Electrical Applications</b>	3
Students are introduced to automotive electrical applications such as charging systems and starting systems and problem diagnosis.	
<b>AUTOM 106 Shop Safety/Meter Certification</b>	1
Introduction to automotive shop safety and equipment use protocol. Students learn to operate a standard diagnostic meter.	
<b>AUTOM 121 Basic Engine Performance</b>	5
Students are introduced to engine performance, diagnosis, and computer applications.	
<b>AUTOM 122 Basic Ignition Systems</b>	5
Students are introduced to electronic and computer operated ignition systems including primary controls and secondary high voltage.	
<b>AUTOM 123 Introduction to Fuel Systems</b>	4
Students are introduced to electrical and mechanical fuel delivery systems and test equipment.	
<b>AUTOM 124 Introduction to Emissions Systems</b>	2
Students are introduced to EGR, evaporative and exhaust emission systems their requirements and operation.	
<b>AUTOM 125 Introduction to Fuel Injection</b>	2
Students are introduced to electronic fuel injection, controls, and test equipment.	
<b>AUTOM 130 Introduction to Lighting and Instruments</b>	4
Students are introduced to lighting types, switches and controls. Instrumentation theory and applications are examined.	
<b>AUTOM 131 Introduction to Clutches and Manual Transmissions</b>	4
Students are introduced to gear trains and synchromesh transmission operation.	

	CREDITS
<b>AUTOM 132 Automatic Transmissions/Transaxles</b>	4
Students are introduced to automatic transmission principles, hydraulics and planetary gear sets.	
<b>AUTOM 133 Four and All-wheel Drive</b>	4
Students are introduced to four wheel drive, transfer cases and differentials.	
<b>AUTOM 140 Wheel Alignment and Steering Systems</b>	4
Students are introduced to wheel alignment, rack and pinion steering, and suspension systems.	
<b>AUTOM 141 Brake Systems</b>	4
Students are introduced to hydraulics, system splitting, and power brakes.	
<b>AUTOM 142 Disc and Drum Brakes</b>	4
Students are introduced to brake types and applications including anti-loc.	
<b>AUTOM 143 Heating and Air Conditioning Systems</b>	4
Students are introduced to automatic and manual mobile HVAC systems. Principles of heat transfer and refrigerant are examined.	
<b>AUTOM 201 Advanced Engine Repair</b>	5
In this advanced segment detailed engine diagnosis and repair is performed. Crankshaft measuring, plastic gauge and piston rings are all examined.	
<b>AUTOM 202 Engine Assembly</b>	3
In this advanced course, engine subassemblies, cylinder heads, short blocks, and timing components are repaired to current standards.	
<b>AUTOM 203 Automotive Electrical Systems</b>	4
In this advanced course, diagnostic testers and electrical troubleshooting are examined.	
<b>AUTOM 204 Battery, Starters, and Charging Systems</b>	4
In this advanced course, battery, starting, and charging systems are diagnosed and repaired.	
<b>AUTOM 220 Ignition Systems Service</b>	4
In this advanced course, computer and electronic ignition systems are diagnosed and repaired.	
<b>AUTOM 221 Fuel Systems Service</b>	4
In this advanced course, pressurized fuel delivery systems are diagnosed and repaired.	
<b>AUTOM 222 Emissions Systems Service</b>	3
In this advanced course, emissions are measured using modern test equipment and control systems adjusted and repaired.	



	CREDITS
<b>AUTOM 223 Fuel Injection</b>	<b>3</b>
In this advanced course, fuel injection is examined, adjusted and repaired using modern test equipment and diagnostic procedures.	
<b>AUTOM 230 Lighting and Instrument Service</b>	<b>3</b>
In this advanced course, lights, wiring and instrument are examined, adjusted and repaired using modern test equipment and diagnostic procedures.	
<b>AUTOM 231 Clutches and Manual Transmission Service</b>	<b>5</b>
In this advanced course, clutches and transmissions are examined and repaired using modern repair procedures.	
<b>AUTOM 232 Automatic Transmission and Transaxle Service</b>	<b>4</b>
In this advanced course, automatic transmissions and transaxles are examined and repaired using modern repair procedures.	
<b>AUTOM 233 Four and All-Wheel Drive Service</b>	<b>4</b>
In this advanced course, multi wheel drive systems are diagnosed and repaired using modern repair procedures.	
<b>AUTOM 240 Advanced Wheel Alignment and Steering Systems Service</b>	<b>4</b>
In this advanced course, steering and suspension systems are serviced and aligned using modern alignment equipment.	
<b>AUTOM 241 Advanced Brake Service</b>	<b>4</b>
In this advanced course, brake hydraulic systems are serviced using modern brake service equipment.	
<b>AUTOM 242 Advanced Disc and Drum Brake Service</b>	<b>4</b>
In this advanced course, disc and drum brake systems are serviced and repaired using modern brake service equipment.	
<b>AUTOM 243 Applied HVAC Service</b>	<b>3</b>
In this advanced course, heating and air conditioning systems are serviced and repaired using modern AC service equipment.	
<b>AUTOM 250 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	

	CREDITS
<b>AUTOM 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>AUTOM 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>AUTOM 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>AUTOM 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>AUTOM 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>AUTOM 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

	CREDITS		CREDITS		CREDITS
<b>AUTOMOTIVE PARTS/INVENTORY/ WAREHOUSING</b>					
<b>VPM 101 Applied Math</b>	4	<b>VPM 120 Employment Preparation</b>	3	<b>VPM 295 Work-based Learning Experience</b>	5
This course is an introduction to mathematical theory and its application to the vehicle parts marketing. Topics include an overview of general mathematical concepts and how they are successfully utilized in practical situations.		Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.		Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>VPM 106 Material Movement</b>	2	<b>VPM 121 Retail Applications</b>	3	<b>VPM 296 Work-based Learning Experience</b>	2
Students learn to move or transport material/stock and pallets using hand trucks and hand-powered hydraulic lifts.		Students apply skills learned during activities of a retail parts distribution facility when interfacing customers and vendors.		Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>VPM 107 Storage and Distribution</b>	5	<b>VPM 122 Warehouse Applications</b>	3	<b>VPM 297 Work-based Learning Seminar</b>	1
Students learn to locate, sort, place, and stack materials in a storage facility.		Students apply skills learned during activities of a warehouse distribution facility where products are stored and distributed.		Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>VPM 108 Shipping and Receiving</b>	5	<b>VPM 123 Stock Merchandising</b>	3	<b>VPM 298 Work-based Learning – No Seminar</b>	3
Warehousing documentation methods, including receiving documentation, overage, shortage, or damage are included.		Students learn how the storage facility supports the retail or wholesale environment. The completion of warehouse forms, pulling stock, and pricing and building displays is also included.		This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	
<b>VPM 109 Introduction to Vehicle Parts Merchandising</b>	5	<b>VPM 124 Automotive Parts Systems</b>	4	<b>VPM 299 Work-based Learning – No Seminar</b>	6
This course is an introduction to the warehouse/distribution industry. Students learn the fundamentals of environmental protection guidelines within warehouse/distribution centers and how to operate forklifts in a safe and professional manner. Safety practices and procedures common to the industry are also presented.		This course presents the various inventory control systems that are commonly used in automotive parts departments and stores. Determining inventory levels is an integral part of this course.		This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	
<b>VPM 110 Principles of Inventory Control</b>	5	<b>VPM 125 Product Research Systems</b>	4		
This course is an introduction to the principles of inventory control including fittings, valves, accessories, tubing and piping, sizing, and their application.		Students learn to use a variety of automotive parts catalogs, pricing sheets, and parts systems research techniques.			
<b>VPM 112 Stock/Product Order</b>	4	<b>VPM 126 Returns, Exchanges, and POs</b>	2		
Students learn to research product sources, analyze and select appropriate vendors, and order appropriate stock based on research.		Students learn to handle merchandise being returned for refund, "core" returns, warranty returns, and defective merchandise.			
<b>VPM 115 Principles of Salesmanship</b>	5	<b>VPM 293 Independent Projects</b>	1-5		
This course is an introduction to basic principles of salesmanship including the development of customer service skills, product knowledge, and related products for customer consideration.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.			
<b>VPM 116 Retail Point of Sale</b>	3	<b>VPM 294 Independent Projects</b>	1-5		
Retail point of sale systems, how to complete sale transactions, and how to accept all types of monetary payment are emphasized.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.			
<b>VPM 119 Principles of Management</b>	5				
This course is an introduction to the principles of management with emphasis on the skills required of supervisory personnel within the vehicle parts sales environment.					

	CREDITS		CREDITS		CREDITS
<b>BARBER</b>					
<b>BARB 110 Barbering Theory</b>	1	<b>BARB 121 Facial Hair</b>	5	<b>BARB 291 Practical Applications</b>	1-18
This course provides an orientation to the basic science of barber-styling. Concepts of personal and professional aesthetics and future roles within the aesthetics industry are also included.		This course is an introduction to the methods used to prepare a client for shaving, including proper razor handling and stroking. The fourteen facial areas are also included.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>BARB 111 Scalp and Hair Analysis</b>	2	<b>BARB 122 Barbering Applications</b>	5	<b>BARB 292 Independent Projects</b>	1-5
Students are introduced to the techniques used to analyze hair as to texture, density, and growth and their application to the barbering process.		This course provides practical application of barber-styling fundamentals with emphasis on the care of implements, shampooing, and basic haircutting methods.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>BARB 112 Shampooing</b>	3	<b>BARB 123 Intermediate Haircutting Techniques</b>	3	<b>BARB 293 Independent Projects</b>	1-5
This course is an introduction to the basic methods of shampooing, rinsing, and conditioning of the hair.		Students learn various types of hair styles and procedures to perform them.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>BARB 113 Decontamination and Infection Control</b>	5	<b>BARB 124 Haircutting Applications</b>	5	<b>BARB 294 Independent Projects</b>	1-5
This course is an introduction to the proper sanitation procedures relating to tools and equipment, station, and the shop. Additionally, students are trained in safety procedures for barber shops including special emphasis on the materials, equipment, and procedures used for the protection of staff and customers from infectious disease organisms.		Students apply the techniques previously learned in BARB 110,111,113.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>BARB 114 Introduction to Barbering</b>	5	<b>BARB 125 Applied Human Relations</b>	3	<b>BARB 296 Work-based Learning Experience</b>	1-18
This course is an introduction to the fundamentals of barber-styling including the use and care of a variety of barbering implements.		Students learn such human relations skills as interpersonal communications, conflict management on- the-job, and team-building skills.		Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>BARB 115 Safety/First Aid</b>	2	<b>BARB 131 Advanced Techniques</b>	4	<b>BARB 297 Work-based Learning Seminar</b>	1-2
Students learn about proper safety measures concerning the use of electrical equipment, chemicals, and blood-related injuries. Students will also learn and demonstrate shop safety procedures. Students will earn a CPR-First Aid card as a part of this major duty area.		Students are introduced to razor cutting techniques.		Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>BARB 116 Basic Haircutting Techniques</b>	4	<b>BARB 132 Advanced Applications</b>	5	<b>BARB 298 Work-based Learning – No Seminar</b>	1-18
This course provides theory and practical experience in basic shear and clipper haircutting.		This course provides advanced techniques in all phases of hair cutting to ready the student for employment. Students are prepared for State Board licensing examination on theory and practical procedures.		This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	
<b>BARB 117 Customer Service</b>	4	<b>BARB 133 Cutting and Styling Methods</b>	4		
Students learn how to identify customers' needs and solve problems. Special emphasis is given to the development of interpersonal communication skills and examining how employees' actions can directly impact customers' impressions.		Practical applications of cutting and styling are emphasized.			
<b>BARB 118 Applied Communications</b>	3	<b>BARB 134 Cutting and Styling Applications</b>	5		
Students learn effective communication skills and apply them in a practical setting.		This course provides advanced techniques in all phases of hair styling to prepare the student for employment. Students are prepared for the State Board licensing Examination relating to both hair cutting and hairstyling.			
<b>BARB 120 Math for Barbers</b>	3	<b>BARB 135 Hair Styling</b>	2		
Instructional emphasis is on acquiring mathematical and problem-solving skills that apply to the barbering industry.		This course introduces the student to the art of hair style and design with emphasis on the selection of styles to complement facial features.			
		<b>BARB 136 Artificial Hair Services</b>	2		
		Students learn about hair replacement techniques.			
		<b>BARB 137 Practical Applications</b>	2		
		Students learn how measure, fit, cut and style hairpieces.			

	CREDITS
<b>BIOMEDICAL EQUIPMENT TECHNICIAN: CLINICAL ENGINEERING</b>	
<b>BMST 101 Safety Principles</b>	4
Students are provided training in general safety and industrial hygiene. This includes accident prevention, safety laws, safe handling and storing of materials, using tools and equipment safely and protection devices and clothing.	
<b>BMST 102 Blood borne Pathogens</b>	3
Students learn to apply various methods to prepare and ensure a scientifically clean and sterile environment within the laboratory setting. Additional topics include biohazard awareness.	
<b>BMST 103 HIPAA</b>	2
This course covers the uses and disclosures of identifiable health information that are allowed or permitted by the HIPAA Privacy Regulations.	
<b>BMST 104 Applied Math</b>	4
This course is an introduction to math concepts as they relate to electronic circuits.	
<b>BMST 105 Testing Equipment</b>	5
Students learn to safely use and operate a variety of ancillary test equipment. Students receive lab training as well as hands on experience with actual equipment.	
<b>BMST 106 Soldering</b>	2
This course covers most aspects of soldering, a basic requirement in electronic assembly and repair. Types of solder and systems as well as application and removal of solder and good soldering practices are emphasized.	
<b>BMST 107 Schematics</b>	3
Students learn how to draw schematics/block diagrams, read and plan diagnostic procedures, and use a five-step troubleshooting/servicing format.	
<b>BMST 109 Applied Service I</b>	3
This course prepares students to manage and repair shop projects. Projects may include preventive maintenance, installation, testing, calibration, and repair of various types of equipment.	
<b>BMST 110 Applied Service II</b>	2
This course prepares students to manage and repair shop projects. Projects may include preventive maintenance, installation, testing, calibration, and repair of various types of equipment.	

	CREDITS
<b>BMST 119 Medical Equipment Research I</b>	1
This is an independent research project meant to build research and presentation skills. Students are required to produce six research projects to an audience. Projects subjects may vary from medical equipment, companies or professional associations, among others. Prior project approval from the instructor is required.	
<b>BMST 201 Imaging Systems</b>	3
This course covers several types of imaging processes and the associated physics behind those systems. The class is lecture and lab based, systems investigated may include ultrasound, X-ray, PET, MRI and CT scan among others.	
<b>BMST 204 Basic A&amp;P for Biomedical Technology</b>	4
The purpose of this course is to introduce students to the importance of the human body and its various organ systems. This course is designed for biomedical students and is a one quarter lecture course. The course will cover internal organ systems, such as cardiovascular, digestive, endocrine, lymphatic, respiratory, reproductive, and urinary. Students should come away with an understanding of the above systems, how they are anatomically structured, and how that structure aids in each system's functionality.	
<b>BMST 215 Introduction to Medical Terminology</b>	3
This course covers some of the common terms, acronyms, roots and prefixes associated with the biomedical field. Instruction is delivered in three sections via the internet using Quia. Each section has multiple quizzes and is supplied with useful links for self study. Students complete each section pre final before moving to the next section. A final exam is given at the end of the course.	
<b>BMST 217 Biomedical Instrumentation</b>	5
This course is an introduction to the more common medical test equipment used by practicing biomedical engineering technicians. Students learn the operating principle and use of this equipment.	
<b>BMST 218 Biomedical Equipment</b>	3
This course covers several types of medical equipment: ECG, Pulse Oximeter, NIBP, and infusion pumps are some of the types of equipment. The history, use, theory of operation, and maintenance issues are also presented.	

	CREDITS
<b>BMST 219 Medical Equipment Research II</b>	2
This is an independent research project meant to build research and presentation skills. Students are required to produce six research projects to an audience. Projects subjects may vary from medical equipment, companies or professional associations, among others. Prior project approval from the instructor is required.	
<b>BMST 220 Biomedical Engineering Applications</b>	5
During this course students are exposed to a lab setting meant to simulate an actual working environment. Student may intake, service, repair, or evaluate medical or other types of equipment. Equipment may be provided by the class or public; students perform as closely as possible to a daily BMET routine.	
<b>BMST 291 Practical Applications</b>	1-18
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>BMST 292 Independent Projects</b>	1-5
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>BMST 293 Independent Projects</b>	1-5
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>BMST 294 Independent Projects</b>	1-5
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	

	CREDITS	CREDITS	CREDITS
<p><b>BMST 296 Work-based Learning Experience</b></p> <p>Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.</p>	1-18		
<p><b>BMST 297 Work-based Learning Seminar</b></p> <p>Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.</p>	1-2		
<p><b>BMST 298 Work-based Learning – No Seminar</b></p> <p>This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.</p>	1-18		

	CREDITS		CREDITS		CREDITS
<b>BROADCASTING/VIDEO PRODUCTION</b>					
<b>BROAD 103 Safety and First Aid</b>	2	<b>BROAD 114 Introduction to Studio and Field Production</b>	3	<b>BROAD 125 Record and Playback Devices</b>	3
This course is an introduction to the safety practices common to the broadcast and video production environment. Students will hold a CPR/First Aid Certification card after successful completion of the course.		Basic equipment and skills used for video production in the studio and in the field are introduced and practiced. Students learn about cameras, lighting instruments, and audio equipment and the skills needed to complete production projects.		Students learn the basic theory and practice the operational skills necessary to adjust, set up and operate record and playback devices. The adjustment of system support equipment is also included.	
<b>BROAD 105 Broadcast Electronics Theory</b>	3	<b>BROAD 116 Principles of Lighting</b>	3	<b>BROAD 126 Elements of Audio I</b>	3
Students are introduced to the principles and applications of resonant circuits, power supplies, oscillators, and AF and RF amplifiers. This unit is taught concurrently with BROAD 107 so that basic system understanding may be tied to basic electronic concepts.		This course introduces students to lighting theory and techniques with emphasis on the most commonly used lighting instruments and accessories, light grids, dimmer boards, and control systems. Practical applications include lighting set up for productions.		Students learn patching and routing, and the distribution of television audio signals. Practical applications include the operation of audio record, playback, and pick up devices for productions and the set-up of control systems.	
<b>BROAD 106 Applied Electronics</b>	3	<b>BROAD 117 Program Editing I</b>	3	<b>BROAD 127 Production Editing I</b>	3
A continuation of the concepts introduced in BROAD 105, students learn how electronic theory is applied to broadcast circuits. This unit is taught concurrently with BROAD 108 so that basic system understanding may be tied to more advanced electronic principles.		Students are introduced to audio and video editing methods. Practical applications include correcting recorded flaws and timing errors while editing prerecorded material. Students perform to edit quality test standards.		Students are introduced to both linear and non-linear systems. The proper planning, execution, and monitoring of audio and video continuity through the use of various hardware driven editing systems is also included. Students edit projects in order to create commercial and program material.	
<b>BROAD 107 Electronic Concepts</b>	3	<b>BROAD 118 Control Room Equipment I</b>	3	<b>BROAD 129 Audio Techniques</b>	4
Students are introduced to the study of modern electronics through a series of lectures and class discussions that are designed to be enjoyable, understandable, and practical. Topics covered range from beginning electro-static principles and Ohm's law to electromagnetic, inductive, and capacitive properties.		Students practice the operational skills necessary to set up, adjust, and operate various television control room hardware under broadcast operational conditions. Students learn how check program quality and make adjustments as needed.		While using audio record and playback equipment for productions, students develop audio editing, sweetening, and mixing technique. Advanced field audio techniques are also presented.	
<b>BROAD 108 Electronic Principles</b>	3	<b>BROAD 119 Basic Maintenance and Troubleshooting</b>	3	<b>BROAD 201 Analog Systems I</b>	3
Students apply their knowledge of electro-static principles, Ohm's law, and electromagnetic, inductive, and capacitive properties to broadcast equipment and systems.		Preventative maintenance methods and strategies are explored as students receive training in the use of electronic measuring devices, meters, and scopes. Soldering, splicing, and making cable connections are included in this unit.		Basic analog linear systems, aural and visual along with the color encoding process, are analyzed and discussed. Heterodyne and component analog systems are also covered. Students apply analog system principles to broadcast systems.	
<b>BROAD 109 Characteristics of Sound</b>	3	<b>BROAD 120 Introduction to Digital Recording</b>	5	<b>BROAD 202 Advanced Broadcast Formats</b>	3
This course is an introduction to the physical nature of sound and how the ear translates it from a physical phenomenon to a sensory one. Topics include waveform characteristics, reflection, diffraction, frequency response, phase, loudness levels, sound-pressure levels, thresholds, and perceptions.		Students receive training in the operation of digital audio workstations.		Students learn Advanced Television Systems Committee (ATSC) system requirements and standards. They also contrast and compare analog and digital broadcast technologies.	
<b>BROAD 112 Basic Audio Equipment</b>	3	<b>BROAD 121 Production Process Theory</b>	3	<b>BROAD 203 Introduction to Digital Systems 2</b>	3
Basic audio tools including pickup, monitoring, distribution, routing, and manipulation devices are introduced and explored.		Students are introduced to the production process: theory, planning, and the application of sound project planning. Identification of the responsibilities of various jobs within the production unit is also included.		Students are introduced to digital theory, concepts, and languages as well as sampling rates, quantum levels, and basic compression techniques. Analyzing system hardware and planning basic configurations is also included.	
<b>BROAD 113 Studio Acoustics</b>	3	<b>BROAD 123 Introduction to Broadcast Systems</b>	3	<b>BROAD 204 Introduction to Operating Systems</b>	3
This course is an introduction to the design and construction of studios for a variety of applications including audio project, music, and audio-for-visual studios. Acoustics for control rooms is also examined.		Students are introduced to the fundamentals of the television signal, cable, microwave, satellite, and internet communication systems. The setup of basic video systems, along with audio and visual measuring equipment, is also covered.		Computer platforms and operating systems are analyzed and studied as students study various computer setup protocols and demonstrate basic system administration skills.	

	CREDITS		CREDITS		CREDITS
<b>BROAD 205 Receivers/Transmitters</b>	5	<b>BROAD 221 Satellite Communications</b>	2	<b>BROAD 247 Program Editing II</b>	5
Students are introduced to the principles and applications of types of modulation, transmitters, receivers, power distribution systems, and grounding. BROAD 106 is a prerequisite for this unit which begins to prepare the student for the Society of Broadcast Engineers certification examination.		Students learn the theory of operation of satellite up-link and down-link equipment. Using down-link equipment, students perform satellite acquisition applications.		A continuation and expansion of Program Editing I, this covers the editing of program and promotional material to meet station scheduling requirements. Students also develop edit decision lists to perform critical program continuity edits. BROAD 117, Program Editing I, is a prerequisite for this course.	
<b>BROAD 206 Power and Communication Systems</b>	3	<b>BROAD 223 Systems Maintenance</b>	5	<b>BROAD 248 Network Storage and Control</b>	4
A continuation of the concepts introduced in BROAD 205, students study the applications and principles of types of modulation, transmitters, receivers, power distribution systems, and grounding. The additional topics of cable, microwave, satellite, and fiber optic communication will also be covered. BROAD 205 is a prerequisite for this course.		Students practice a variety of skills: testing equipment, soldering, interpreting block and schematic diagrams, repairing electronic equipment, troubleshooting, and non-specific servicing.		Students learn to operate various automation systems used in broadcasting including media preparation workstations and playout control systems. Media management concepts are also included.	
<b>BROAD 207 Advanced Editing Projects</b>	5	<b>BROAD 227 DTV Transmission Systems/8VSB</b>	4	<b>BROAD 251 Introduction to the TV Process</b>	3
Students conduct and complete an advanced digital editing project for a datacast application.		Students analyze and discuss fundamentals of DTV transmission systems including data randomizer, forward error correction, Reed Solomon encoder, data interleaver, trellis encoder and data multiplexer. Fundamentals of SSB, 8-VSB modulator, pilot insertion, VSB filter and modulator, RF up-converter, 8-VSB spectrum, 8-VSB transmission measurements, and adjacent channel considerations are also discussed.		This course is an introduction to idea formation and development, scripting, and the use of story boarding and shot lists in the planning and completion of productions.	
<b>BROAD 209 AC/DC Circuits</b>	5	<b>BROAD 229 Compression: MPEG-II &amp; AC-3</b>	2	<b>BROAD 252 TV Production Applications</b>	5
Students study, analyze, and compare active devices in AC and DC circuits, solving circuit problems. Frequency, wavelength, and antenna systems are also studied.		Students discuss and analyze 5.1/AC-3 video compression and image artifacts as well as digital transport system and 188 byte MPEG-II. Students compare contrast transport standards against transmission standards.		A continuation of the concepts introduced using production models such as effect-to-cause and process message, students apply production process methods in a broadcast production environment. Other elements presented include writing program proposals, preparing budgets, writing scripts, developing facilities requests, creating schedules, completing permits and clearances.	
<b>BROAD 210 AC/DC Applications</b>	4	<b>BROAD 231 Broadcast Station Operations</b>	5	<b>BROAD 255 Lighting Techniques</b>	5
Students apply knowledge of active devices in AC and DC circuits, solving complex circuit problems. The interaction of frequency, wavelength, and antenna systems is further analyzed.		All aspects of operating a broadcast station are included: Federal Communications Commission rules and requirements, formats, programming and promotions, advertising, ratings and demographics, and traffic department and log-keeping.		This course introduces students to the advanced functions of lighting theory and technique with emphasis on fixture repair, special effect lighting, and the use of color correction, diffusion, reflection, and deflection. Students also practice computing and splitting loads and creating lighting plans for field and studio productions.	
<b>BROAD 215 ATSC Formats and Transcoding</b>	2	<b>BROAD 237 Control Room Equipment II</b>	5	<b>BROAD 260 Studio Camera Equipment</b>	3
Topics for discussion and analysis include serial digital and component formats, transcoding, transport streams and data integration as well as possible artifact and "latency" anomalies.		Students practice advanced control room operational skills as they learn the steps necessary to apply program material into computer-based server systems. This includes satellite, network, internet and other available program streams.		This course is an introduction to studio camera equipment, accessories, and mounting equipment.	
<b>BROAD 217 Audio Engineering</b>	5	<b>BROAD 239 Production Audio Preparation</b>	5	<b>BROAD 261 Studio Camera Operations</b>	5
Students practice audio measurements and standards by testing audio equipment under broadcast conditions. Headroom and distortion parameters are discussed as well as designing, building, and installing audio impedance matching devices and 'pads'. Practical applications include an audio installation / set-up technician / sound engineer.		Students learn to create scripts and work with project budgeting, prepare talent for production, practice voiceovers, and determine which sounds/music to use in productions.		In the second of two units on studio camera operation fundamentals, operate studio cameras and camera systems and teleprompting equipment.	
<b>BROAD 219 Video Engineering</b>	4	<b>BROAD 243 Master Control Operations II</b>	5	<b>BROAD 262 Set Design</b>	3
Students learn the limitations of human visual perception as it pertains to visual acuity. Practical applications include the analysis of video camera formats, light sources, and color temperatures. Using manuals and test equipment, students learn to set up and align test equipment, monitors and camera systems.		Students operate all signal delivery system components used to feed audio and video signals to the program feed. They also monitor and meet all television signal standards and perform as the master control operator.		This course introduces the student to set design techniques and methods, set properties, dressings, and various scene components. Practical applications including designing, drawing, building, and repairing scene components.	

	CREDITS
<b>BROAD 265 Field Production</b>	<b>7</b>
This course is designed to develop advanced field production skills necessary to complete remote projects. Included are site surveying, planning, set up, and lighting of different venues and completing projects using single or multiple cameras.	
<b>BROAD 267 Production Editing II</b>	<b>2</b>
Students complete assigned projects using supplied elements. Evaluation will be based on meeting all applicable industry standards.	
<b>BROAD 273 Video Graphics Applications</b>	<b>5</b>
This course is an introduction to advanced graphic scenarios, 3-D, and animation techniques with emphasis on methods used to import and export various graphic formats and the development and creation of graphic packages.	
<b>BROAD 276 Technical Directing</b>	<b>6</b>
This course introduces students to the video switchers, video routing systems, video manipulation devices, system timing, and video patching systems commonly used in production. Other areas of emphasis include the technical director duties and responsibilities, the use of keys, chroma keys, and other special effects.	
<b>BROAD 283 Emerging Technologies</b>	<b>3</b>
Advances in audio and visual imaging as well as emerging technologies including 'wavelet' and 'fractile' compression, broadcast media interactivity, and other sensory delivery systems are presented.	
<b>BROAD 285 Practicum I</b>	<b>5</b>
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.	
<b>BROAD 286 Practicum II</b>	<b>5</b>
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.	

	CREDITS
<b>BROAD 287 Practicum III</b>	<b>5</b>
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.	
<b>BROAD 288 Practicum IV</b>	<b>1-5</b>
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.	
<b>BROAD 289 Practicum V</b>	<b>1-5</b>
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.	
<b>BROAD 290 Practicum VI</b>	<b>1-5</b>
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.	

CREDITS



	CREDITS		CREDITS		CREDITS
<b>CARPENTRY</b>					
<b>CARPT 101 Carpentry Math</b>	3	<b>CARPT 110 Foundation</b>	3	<b>CARPT 208 Siding</b>	5
This course is an introduction to basic math concepts and their applications to the carpentry field. Linear, board, and square foot measurements and using formulas to calculate material requirement and costs is emphasized.		This course is an introduction to the materials and methods used to construct concrete forms and foundations including various reinforcement methods such as re-bar and welded-wire fabric.		Types of exterior siding, surface covering systems, and the equipment used to apply them are emphasized.	
<b>CARPT 102 Safety Principles</b>	3	<b>CARPT 111 Foundation Footings</b>	3	<b>CARPT 212 Moldings</b>	4
This course is an introduction to the safety concerns and procedures used in the construction field. Students apply approved construction site safety and health procedures, use personal protection gear, and safely use hand and power tools.		The correct and accurate placement of footings and piers are emphasized.		The installation of a variety of trim pieces is emphasized.	
<b>CARPT 103 Prints and Plans</b>	4	<b>CARPT 112 Foundation Walls</b>	5	<b>CARPT 213 Employment Preparation</b>	2
This course is an introduction to residential blueprint reading with emphasis on plan types, dimension lines, scaling prints, and the symbols and abbreviations common to a variety of construction plans.		This course is an introduction to the methods used to build, align, and establish concrete grades in forms. Materials calculation is also included.		Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.	
<b>CARPT 104 Construction Materials</b>	2	<b>CARPT 201 Floor Systems</b>	5	<b>CARPT 215 Practical Applications</b>	2
The selection and installation of various types of construction materials is emphasized. Students learn about the types and sizes of lumber, the use of fasteners in carpentry, and the installation of hardware.		This course is an introduction to the variety of floor types: requirements, assembly, and the advantages and disadvantages of each. Practical applications include the installation and finishing of hardwood floors, laminate/engineered floors, and tile.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CARPT 105 Tools and Equipment</b>	4	<b>CARPT 202 Wall and Ceiling Construction</b>	5	<b>CARPT 291 Practical Applications</b>	1-18
The proper use and care of measuring, layout, and hand tools is emphasized.		Students learn to frame walls and ceilings according to federal, state, and local requirements.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CARPT 106 Power Tools</b>	5	<b>CARPT 203 Stairs</b>	3	<b>CARPT 292 Independent Projects</b>	1-5
This course is an introduction to the proper use and care of portable, stationary, electric, and pneumatic equipment.		This course is an introduction to the design and construction of residential and commercial stair systems. Topics include stair design factor, building code requirements, stair layout, cutting, installation, and various tread/riser installations.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CARPT 107 Optical Instruments</b>	3	<b>CARPT 204 Introduction to Roofing</b>	3	<b>CARPT 293 Independent Projects</b>	1-5
The use various transits and levels used in the construction industry is presented.		This course is an introduction to the types of roofs including the layout of rafters for a variety of roof types: gable, hip, valley intersections. Both stick-built and truss-built roofs are included.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CARPT 108 Plot Plans and Building Layout</b>	3	<b>CARPT 205 Roof Construction</b>	5	<b>CARPT 294 Independent Projects</b>	1-5
The interpretation of architectural plans and their application at the construction site is emphasized. Topics include the principles, equipment, and methods used to perform the site layout tasks. The process of distance measurement as well leveling for site layout is also presented.		Practical applications using conventional methods of layout and sequence of assembly to erect a structure is emphasized.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CARPT 109 Introduction to Framing</b>	4	<b>CARPT 206 Introduction to Exterior Finish Methods</b>	4	<b>CARPT 296 Work-based Learning Experience</b>	1-18
This course is an introduction to the procedures used to lay out and frame walls and ceilings including roughing-in door and window openings, constructing corners and partition Ts, bracing walls and ceilings, and applying sheathing.		This course is an introduction to the materials and methods used for sheathing and exterior siding.		Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
		<b>CARPT 207 Exterior Doors and Windows</b>	5	<b>CARPT 297 Work-based Learning Seminar</b>	1-2
		This course is an introduction methods used to install a variety of windows, skylights, and exterior doors. The installation of weather-stripping and locks is also included.		Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	

	CREDITS
<b>CARPT 209 Introduction to Interior Finish Methods</b>	3 This
course is an introduction to the types of interior systems, materials, and hardware commonly used in residential and commercial construction. The development of estimating skills to determine the cost of materials is also introduced.	
<b>CARPT 210 Interior Floors, Walls, and Ceilings</b>	4
Course emphasis is on surface preparation and applications methods that meet federal, state, and local requirements. Methods used to protect the interior of a structure against natural and man-made elements is also included.	
<b>CARPT 211 Interior Doors and Windows</b>	5
The proper sequence used to set doors and install trim and hardware for both doors and windows is emphasized.	
<b>CARPT 298 Work-based Learning – No Seminar</b>	1-18
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

## CIVIL ENGINEERING TECHNOLOGY

	CREDITS
<b>CET 101 Introduction to Civil Engineering</b>	3
This course is an introduction to the wide variety of projects tasked to civil engineers and how calculations are used. Typical calculations, fundamental dimensions, and units are introduced. The student learns the typical notations used and techniques to scale, format, and annotate calculation sheets.	
<b>CET 103 Statics</b>	3
This course is an introduction to typical gravitational and lateral simple systems found in civil engineering. The concepts of reactions, Hooke's Law, elastic behavior of simple members under axial, bending, and torsion, forces are studied. The student learns about the coordinate systems required to properly model 3D vectors.	
<b>CET 105 Structural Analysis</b>	3
This course is an introduction to the principles of the properties of typical structural section areas and volumes and covers basic structural types such as trusses, beams, columns, and footings. Basic material science and its structural properties are also covered.	
<b>CET 107 CAD – 2Dimension</b>	3
This course is an introduction to AUTOCAD in two dimensions and covers drawing file types, templates, layers, and basic draw and modify commands. The student learns the Cartesian coordinate system and typical plate layout for a typical plan elevation and section drawing as well as annotation and plotting.	
<b>CET 109 Introduction to Surveying</b>	3
This course is an introduction to surveying and how it relates to civil engineering with emphasis on the application of modern surveying equipment. The student learns the Public Land Survey System and horizontal and vertical datums. Spherical and Cartesian coordinate systems are also studied.	
<b>CET 111 Civil 3D Surfaces and Points</b>	3
This is an introductory course on digital survey points and TIN surfaces in civil 3D. The student learns point file formats, data transfer, point styles, and labels. The creation and editing of surfaces are included along with manipulating styles and labels and includes the concepts of contours and surface profiles.	
<b>CET 113 Hydrology</b>	3
This course is an introduction to hydrology and includes the study of regional rainfall events and how to calculate runoff from a project site. The student learns how to model a runoff basin, identify soil types and land, and to use different computer models common in the field.	

	CREDITS
<b>CET 115 Agency Requisites</b>	3
This course is an introduction to the different agencies and jurisdictions encountered when doing a typical civil engineering project. The student learns how to determine which agency, code, and design manual are applicable for a particular project.	
<b>CET 117 GIS Resources</b>	3
This course is an introduction to the concepts and uses of the geographic information system (GIS) including history of GIS; GIS data structures and sources of data; GIS tools, vendors, and software; applications; and resources. Practical applications include spatial data display and query, map generation, and simple spatial analysis using Autodesk Map.	
<b>CET 121 Coordinate Geometry</b>	3
This course is an introduction to how surveyors and engineers calculate points along lines and curves typically used in the field. The student learns how to draw problems to scale, the concept of bearings, and use trigonometry to solve right triangles. Horizontal and vertical curves are introduced.	
<b>CET 123 Alignments and Profiles</b>	3
This course is an introduction to horizontal and vertical alignments. The student learns how design conditions affect the layout of works. Topics include how design speeds, sight distance, and maximum and minimum grades influence the design of roads. Also covered are how to model alignments and profiles in civil 3D.	
<b>CET 125 Basic Corridors in Civil 3D</b>	3
This course is an introduction to typical cross sections used in civil engineering. The student learns how to create typical assemblies to model basic road corridors in civil 3D. The concepts of side slopes, daylight, and catch points are also covered.	
<b>CET 127 Surveying - Control</b>	3
This course is an introduction to the concept of project control. Topics include site recon, control layout, datums and data collector set up. The student learns how to determine control point locations and set monuments and traverse in three dimensions to a required horizontal and vertical closure.	
<b>CET 131 Construction Materials</b>	3
This course is an introduction to the typical materials used in a civil engineering project. The materials studied include concrete, asphalt, rock, PVC, steel, and soil. The student learns how to determine the required specifications, testing requirements, placement, measurement, and payment for a project.	
<b>CET 133 Civil 3D Grading</b>	3
This course is an introduction to the concept of project control. Topics include site recon, control layout, datums and data collector set up. The student will learn how to determine control point locations, set monuments and traverse in three dimensions to a required horizontal and vertical closure.	

	CREDITS		CREDITS		CREDITS
<b>CET 135 Utilities Design</b>	<b>3</b>	<b>CET 218 Erosion Control</b>	<b>3</b>	<b>CET 291 Practical Applications</b>	<b>1-18</b>
This course is an introduction water, sanitary and storm sewer design. The student learns how to determine agency requirements, required details, calculations, size, and model in civil 3D pipe and structure networks. Topics also include pipe trenching, bedding, backfill, and layout for the various utilities.		This course is an introduction to the concepts of erosion control and the best management practices used to limit sediment runoff from construction sites. The student learns how to research agency requirements and prepare an erosion control plan and maintenance schedule.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CET 137 Topographic Surveying</b>	<b>3</b>	<b>CET 220 Road Design</b>	<b>3</b>	<b>CET 292 Independent Projects</b>	<b>1-5</b>
This course is an introduction to design topographic surveys required for typical civil engineering projects. The student learns how to plan the control, datums, and limits of the survey. In addition, they set up job files and acquire the required data using robotic total station equipment.		This course is an introduction to road design in a specific jurisdiction and site with emphasis on the ability to determine the agency requirements and design data, procure required site topographic data, and prepare a proposed road design which will meet the jurisdiction's requirements.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CET 202 Finite Element Models</b>	<b>3</b>	<b>CET 222 Construction Documents</b>	<b>3</b>	<b>CET 293 Independent Projects</b>	<b>1-5</b>
This course is an introduction to finite element computer modeling with emphasis on static models and how they are used to determine member stresses and deflections. The student learns how to create 2D and 3D models of beams, trusses, and frames using CadreLite.		This course is an introduction to the preparation of construction plans required for typical engineering projects. The student learns how to research agency requirements, prepare cover and detail sheets, format plan and profile sheets, and lay out required cross sections. Civil 3D's sheet set function is introduced.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CET 204 3D Structural Modeling</b>	<b>3</b>	<b>CET 224 Advanced Corridors in Civil3D</b>	<b>3</b>	<b>CET 294 Independent Projects</b>	<b>1-5</b>
This course is an introduction to three dimensional modeling of structural elements in civil 3D. The student learns how to create and orient 3D elements such as cables, beams, and footings and how to connect various elements together.		This course covers advanced corridor design techniques in civil3D. The student learns how to model roundabouts, intersections, and cul-de-sacs. Additional topics include adding trenches, retaining walls and guard rails to basic corridors.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CET 208 Civil 3D Structural Sections</b>	<b>3</b>	<b>CET 226 Construction Staking</b>	<b>3</b>	<b>CET 296 Work-based Learning Experience</b>	<b>1-18</b>
This course is an introduction to drafting typical structural section details. The student learns how to plan the layout and scale to draft typical sections including retaining walls, beam/column connections, and footings.		This course is an introduction to construction staking of typical engineering projects. The student learns how to create survey data for the different elements, export alignments, and profiles and design surfaces to the data collector. The student also learns the stakeout function in the field and how to write up guard stakes.		Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>CET 210 Contract Documents</b>	<b>3</b>	<b>CET 231 Projects I and Special Topics I</b>	<b>3-5</b>	<b>CET 297 Work-based Learning Seminar</b>	<b>1-2</b>
This course is an introduction to contracts used in the civil engineering field with emphasis on the basic elements of a contract and the different types of documents that make up a project contract. The student learns how the plans and specifications are enforced in the construction process.		This course is a culmination of the program of study for the CET degree. Students will complete a combination of a project and one or more special topics. The student will work in a team or individually, and the decision of the project and team members will be a joint decision between the instructor and the student and/or students. This class could be taken consecutively with CET 232 by special arrangement with the instructor and registrar; or it can be taken individually. The number of credits will be determined based on the need for requirements of graduation.		Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>CET 212 Open Channel Flow</b>	<b>3</b>	<b>CET 232 Projects II and Special Topics</b>	<b>3-5</b>	<b>CET 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is an introduction to open channel flow. The student learns how calculated and computer model flow in various types of open channels use in civil engineering such as pipes, ditches, and trapezoidal channels.		This course is a culmination of the program of study for the CET degree. Students will complete a combination of a project and one or more special topics. The student will work in a team or individually, and the decision of the project and team members will be a joint decision between the instructor and the student and/or students. This class could be taken consecutively with CET 231 by special arrangement with the instructor and registrar; or it can be taken individually. The number of credits will be determined based on the need for requirements of graduation.		This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	
<b>CET 214 Drainage Reports</b>	<b>3</b>				
This course is an introduction to the preparation of typical drainage reports and analyses required for typical engineering projects. The student learns how to research agency requirements and design data and prepare the required elements to be included in the report.					
<b>CET 216 Civil 3D Storm Plans</b>	<b>3</b>				
This course is an introduction to the preparation of typical drainage plans used for construction. The student learns how to research agency requirements and incorporate them into a civil 3D model. The course focuses on the pipe network modeling and analysis functions in civil 3D.					

	CREDITS
<b>CNC MACHINIST</b>	
<b>CNCM 101 Introduction to Manufacturing Processes</b>	<b>3</b>
This course is an introduction to the safety practices and habits required when working in the machine shop environment. Topics presented include chemical safety, lifting and crane procedures, the safe use of ladders, and the necessity for personal protective equipment. Machine –specific safety procedures used around pneumatic and hydraulic equipment is emphasized	
<b>CNCM 102 Machining Fundamentals</b>	<b>3</b>
This course is an introduction to the machines and techniques used in the machine shop industry. The history of machine tools and their development into the machines of today are included in this evaluation of current best practices including speed and feed calculations.	
<b>CNCM 103 Engineering Drawing Interpretation</b>	<b>4</b>
This course is an introduction to the basic principles of blueprint reading as it relates to machine shop-CNC operations. The interpretation of information located on engineering drawings and parts list navigation is emphasized.	
<b>CNCM 104 Geometric Dimensioning and Tolerancing</b>	<b>2</b>
This course is an introduction to the use of symbols used on modern engineering drawings as specified in ANSI standard Y14.5.	
<b>CNCM 105 Secondary Operations, Benchwork</b>	<b>2</b>
This course is an introduction to deburring, filing, and the use of punches, chisels, hammers and other hand tools.	
<b>CNCM 106 Precision Measurement</b>	<b>3</b>
This course introduces, provides practice in, and evaluates a student's ability to use precision measuring equipment.	
<b>CNCM 109 Lathe I</b>	<b>4</b>
This course introduces the student to the conventional lathe. The student makes a simple turned project.	
<b>CNCM 110 Mill I</b>	<b>2</b>
This course introduces the student to the conventional milling machine. The student makes a simple milled project.	
<b>CNCM 111 Introduction to CNC Technology</b>	<b>2</b>
This course introduces the student to the many ways CNC technology is used today. Machining, science, the food industry and many other applications of CNC are examined.	

	CREDITS
<b>CNCM 112 CNC Controls</b>	<b>3</b>
This course introduces the student to the main differences between the most commonly available CNC controls in use by industry today.	
<b>CNCM 113 CNC Programming</b>	<b>4</b>
This course introduces the student to programming using standard EIA code (G and M codes) The student will produce new programs and edit existing programs manually (without CAD/CAM).	
<b>CNCM 114 CNC Troubleshooting</b>	<b>3</b>
This course presents program and hardware problems to the student. Included are ATC arm failures, program errors, coordinate system setting errors, tool setting errors and power system failures, and how to recover from them.	
<b>CNCM 201 CNC Lathe I</b>	<b>4</b>
This course has the student run the CNC Lathe from power on to shut down using existing programs, and tooling.	
<b>CNCM 202 CNC Lathe II</b>	<b>4</b>
This course has the student run the CNC Lathe from power on to shut down using student prepared programs.	
<b>CNCM 203 CNC Milling I</b>	<b>5</b>
This course has the student set up and run the CNC machining center from power on to shut down using existing programs. The student will use tools from a common cutter package.	
<b>CNCM 204 CNC Milling II</b>	<b>5</b>
This course has the student set up and run the CNC machining center from power on to shut down using student created programs. The student will program and run a part from a blueprint using existing work holding devices.	
<b>CNCM 205 Computer-Aided Manufacturing</b>	<b>4</b>
In this course the student will learn to use CAM software to program parts from engineering drawings.	
<b>CNCM 206 Introduction to Computer-Aided Drafting (CAD)</b>	<b>2</b>
Students are introduced to the fundamental skills involved in using CAD and CNC programs in the application of CAM (computerized-aided manufacturing) programs to machining operations.	
<b>MFCNC 207 Advanced Projects I</b>	<b>5</b>
During this course the student will do a complete set up of the CNC Lathe and the CNC Mill. The student will choose and load tools, measure and enter tool offsets, load and dial in fixtures, set work coordinate systems, choose and download programs, run a fail-safe routine and use advanced techniques for first part runs.	

	CREDITS
<b>MFCNC 208 Advanced Projects II</b>	<b>5</b>
This course is a continuation of Advanced Projects 1 (CNCM 207)where the student is given more complicated parts to make, and will write their own programs.	
<b>CNCM 209 Advanced Manufacturing Processes</b>	<b>3</b>
This course focuses on High Speed Machining, Flexible Manufacturing Systems (FMS), cell and pull systems.	
<b>CNCM 210 Emerging Technologies</b>	<b>4</b>
This course examines technologies expected to continue to be dominant or to become dominant manufacturing methods within the next 25 years. Water jet, stereo lithography, nanotechnology, ultrasonic machining and liquid metal will be featured.	
<b>CNCM 220 CAD I</b>	<b>4</b>
Students apply the fundamentals of drafting techniques to computer-based methodology. Emphasis is on how to set up drawing sheets, establish layers and line types, and create standard drawing geometry.	
<b>CNCM 221 CAD II</b>	<b>5</b>
Students apply previously acquired skills and learn how to set sheet limits, construct and place viewports, scale viewports, and create and position ANSI standard title blocks.	
<b>CNCM 222 CAD III</b>	<b>5</b>
Students learn how to use viewing parameters, insert drawing text, modify existing geometry, and begin to create drawings for fundamental projects to meet client specifications.	
<b>CNCM 223 Electronic Fundamentals</b>	<b>4</b>
Students receive training in the subjects that form the heart of basic electricity and electronics. From batteries, magnetism and resistors, through Ohm's Law, series and parallel circuits to networks, measurements, electronic devices, alternating current theory and the application of these fundamentals in systems used within a manufacturing process, such as programmable controllers and scanners.	
<b>CNCM 224 Electronic Applications</b>	<b>3</b>
A continuation of the concepts introduced in CNCM 223, students apply the fundamentals in systems used within a manufacturing process.	
<b>CNCM 225 Microcontrollers</b>	<b>3</b>
Students learn and demonstrate their knowledge of microcontrollers. manufacturing. Here they apply their knowledge of fluid power systems and programmable controllers in manufacturing and production situations. In this basic course, they learn to determine end-efforts and set up robotic systems.	

	CREDITS
<b>CNCM 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CNCM 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CNCM 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CNCM 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>CNCM 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>CNCM 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>CNCM 226 Hydraulics and Fluid Power</b>	<b>2</b>
This course introduces the student to hydraulic system fundamentals and to the use of hydraulics/pneumatics in manufacturing systems. Students learn hydraulic/pneumatic theory, component design for hydraulic valves and actuators, and system applications.	

	CREDITS
<b>CNCM 227 Sensors/Scanner Technology</b>	<b>3</b>
This course provides an introduction into industrial instrumentation as it pertains to manufacturing environments. Students acquire fundamentals of sensors/scanners and their applications within production control processes. Additionally, students learn how to design filter and conversion circuits.	
<b>CNCM 228 Programmable Controllers</b>	<b>4</b>
Students learn operational fundamentals/theory and applications associated with programmable controllers, particularly as they pertain to manufacturing processes.	
<b>CNCM 229 Plastic Mold Manufacturing</b>	<b>2</b>
Students are introduced to processes and procedures used in the manufacture of thermoplastic molds, to include casting, punching, and injection molding.	
<b>CNCM 230 Introduction to Mechatronics</b>	<b>3</b>
This course provides an introduction to the concept and practice of mechatronics –particularly with regard to manufacturing. It includes the interface of computers with physical devices (sensors, actuators), data acquisition, real time programming and real time control, human-machine interfaces, and design principles of mechatronics in manufacturing systems.	
<b>CNCM 231 Basic Robotics</b>	<b>2</b>
Students are introduced to robotic systems used in	
<b>CNCM 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

	CREDITS		CREDITS		CREDITS
<b>COMMERCIAL TRUCK DRIVING-ENTRY LEVEL</b>					
<b>TRUCK 101 Safety/First Aid</b>	3	<b>TRUCK 111 Materials/Cargo II</b>	4	<b>TRUCK 297 Work-based Learning Seminar</b>	1-2
Students learn basic principles of safe driving principles and local and state driving laws with emphasis on the requirements of the Department of Transportation. CPR/first aid training is given.		Students learn preventive maintenance techniques, fork lift operation methods, loading and unloading of cargo, and USDOT Hazardous Materials Regulations.		Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>TRUCK 102 Introduction to the Trucking Industry</b>	4	<b>TRUCK 112 Freeway/Open Road II</b>	4	<b>TRUCK 298 Work-based Learning – No Seminar</b>	1-18
This course is an introduction to the trucking industry including occupation terminology and signage; trucking company structure and its operation; and driver responsibilities on the road and at pickup/delivery points. The completion of inspection reports, daily/monthly logs, freight bills, waybills, manifests, trip planning, and state accident reports is also included.		Students receive additional training and gain experience in long-haul operations.		This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	
<b>TRUCK 103 Commercial Driver's License (CDL)</b>	4	<b>TRUCK 113 Advanced Commercial Driving</b>	4		
Students are prepared to take the CDL tests and endorsements.		Students complete commercial administrative documentation, perform pre-trip and post-trip duties, meet dispatch system requirements, and perform fleet operations area activities.			
<b>TRUCK 104 Pre-Trip Requirements</b>	3	<b>TRUCK 291 Practical Applications</b>	1-18		
This course is an introduction to pre-trip inspection procedures used in the commercial truck driving industry. Students learn to read maps, plan destination and return trips, acquaint themselves with emergency equipment.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.			
<b>TRUCK 105 Close Quarters Operation</b>	5	<b>TRUCK 292 Independent Projects</b>	1-5		
Students learn to drive in a close quarter warehouse type facility: hooking, unhooking of trailers, backing up to docks, and maneuvering in close quarters.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.			
<b>TRUCK 106 Materials/Cargo I</b>	3	<b>TRUCK 293 Independent Projects</b>	1-5		
Students learn preventive maintenance techniques, fork lift operation methods, loading and unloading of cargo, and selecting appropriate hazardous cargo placards.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.			
<b>TRUCK 107 City/Town Driving</b>	5	<b>TRUCK 294 Independent Projects</b>	1-5		
Students learn to operate trucks in city situations: turns, lane changes, clutching and shifting, weather conditions, and parking.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.			
<b>TRUCK 108 Freeway/Open Road I</b>	5	<b>TRUCK 296 Work-based Learning Experience</b>	1-18		
Students learn to operate trucks in open road situations: freeway driving entrance and exiting, passing vehicles safely, and open road parking techniques.		Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.			
<b>TRUCK 110 City/Town Driving</b>	4				
Students receive additional training and gain experience in short-haul operations: in-town driving techniques, environmental factors, and parking techniques.					

## COMPUTER NETWORKING SYSTEMS TECHNICIAN

**CNST 110 MS Client Operating Systems 5**  
This course introduces the student to implementation, administration, and troubleshooting Windows® client operating systems on a networked desktop or mobile platform. This course prepares students for the Microsoft 70-270 Windows XP exam, or the Microsoft 70-680 Windows 7 exam.

**CNST 201 Cisco Network Fundamentals 5**  
The Cisco Networking Academy consists of four blocks. The course is designed to introduce students to the skills and information needed to design, build, and maintain small to medium-size networks. Students are introduced to the basic internetworking fundamentals.

**CNST 202 Cisco Routing Protocols and Concepts 5**  
This is the second block of the Cisco Networking Academy. The course is designed to introduce students to the skills and information needed to design, build, and maintain small to medium-size networks. Students are introduced to routing theory and router technologies.

**CNST 205 Fundamentals of Linux 5**  
This is an introductory course to the Linux environment including file system navigation, file permissions, command line interface, text editor, command shells, and basic network use. This includes learning how to interface a Linux operating system to interact in a Microsoft Windows network.

**CNST 207 Network Infrastructure 5**  
This course introduces the student to installation, managing, monitoring, configuring and troubleshooting DNS, DHCP, remote access, network protocols, IP routing, and WINS in a Windows® Network Infrastructure. This course prepares students for the Microsoft Windows Server 70-291 certification exam.

**CNST 209 Directory Services 5**  
This course introduces the student to installation, configuring, and troubleshooting the Windows® Active Directory and components such as DNS, Active Directory Sites and Services as well as Active Directory replication and security principles. This course prepares students for the Microsoft Windows 70-294 certification exam.

**CNST 210 Network Security 5**  
This course introduces the student to implementing and administering security in a Microsoft Windows network. The student learns about security concepts such as encryption and authentication so that sensitive data may be safely sent across a wide or local area network. This course prepares a student for the Microsoft Windows 70-299 certification exam.

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**CNST 212 Cisco LAN Switching and Wireless 5**  
This is the third block of the Cisco Networking Academy. The course is designed to introduce students to the skills and information needed to design, build, and maintain small to medium-size networks. Students are introduced to advanced routing and switching.

**CNST 213 Cisco-Accessing the WAN 5**  
This is the fourth block of the Cisco Networking Academy. The course is designed to introduce students to the skills and information needed to design, build, and maintain small to medium-size networks. Students will be introduced to the advanced Cisco networking utilizing project based learning.

**CNST 291 Practical Applications 1-18**  
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CNST 292 Independent Projects 1-5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CNST 293 Independent Projects 1-5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CNST 294 Independent Projects 1-5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CNST 296 Work-based Learning Experience 1-18**  
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**CNST 297 Work-based Learning Seminar 1-2**  
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**CNST 298 Work-based Learning – No Seminar 1-18**  
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## CREDITS

**COMPUTER REPAIR & NETWORK SUPPORT**

**CRNS 103 A+ Essentials 4**  
This course prepares students for CompTIA A+ certification. This is an introduction to computer components, operating system software, computer hardware, wireless connectivity, security, safety, environmental concerns, diagnostic tools and communication skills. Virtual learning tools are integrated into the course and provide students with interactive learning experiences. This is a web enhanced course.

**CRNS 104 A+ Practical 4**  
This course builds on the skills learned in the A+ Essentials course. Students learn using actual scenarios how to support PC hardware in a business setting, including installation, troubleshooting, component replacement, networking, and security. Students also learn to manage the Windows operating system.

**CRNS 106 Cisco Networking Fundamentals 5**  
Students develop an understanding needed to maintain small to medium-sized computer Networks, IP addressing, Ethernet, network cabling, and routed protocols. This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. It uses the OSI layered model to examine the nature and roles of protocols. At the end of the course, students understand basic functions of network devices such as routers and switches, and should be able to implement IP addressing. This is a web enhanced course.

**CRNS 107 Cisco Routing Protocols and Concepts 5**  
This course describes the architecture, components, and operation of routers, and explains the principles of routing and routing protocols. Students learn routing principles, simple LAN topologies, basic principles of cabling and IP addressing, and configuration of basic network devices such as routers and switches. Students analyze, configure, verify, and troubleshoot the primary routing protocols RIPv1, RIPv2, EIGRP, and OSPF. This is a web enhanced course.

**CRNS 109 MS Client Operating System 5**  
This course introduces the student to implementation, administration, and troubleshooting Windows® client operating system as a desktop operating system in a networking environment.

**CRNS 110 MS Client Operating System Lab 4**  
In this course students apply the principles of implementation, administration, and troubleshooting with the Windows® client operating system as a desktop operating system in a networking environment.

## CREDITS

**CRNS 111 Advanced Projects 1-7**  
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**CRNS 112 Security Plus 5**  
In this course, students learn strategies and techniques for protecting the integrity of computer networks using cryptography, access control, authentication, security baselines, system updates, intrusion detection and other techniques for limiting security risks. This course helps prepare students for CompTIA's "Security+" certification.

**CRNS 120 Employment Preparation 5**  
Students learn job search techniques, resume writing, and receive assistance in developing career goals, educational plans and participate in classroom discussions and multi-media presentations.

**CRNS 212 LAN Switching and Wireless 5**  
Students learn how to select devices for an efficient network, configure a switch for basic functionality and how to implement Virtual LANs, VTP, and Inter-VLAN routing in a converged network. Students develop the knowledge and skills necessary to implement a Wireless LAN in a small-to-medium network. This is a web enhanced course.

**CRNS 213 Accessing the WAN 5**  
This course discusses WAN technologies required by large, enterprise networks. Students employ Cisco Network Architecture to implement and configure common protocols and to apply WAN security concepts, principles of traffic, access control, and addressing services. Finally, students learn how to detect, troubleshoot, and correct common enterprise issues. This course prepares students for the CCENT/CCNA Cisco certification. This is a web enhanced course.

**CRNS 291 Practical Applications 1-18**  
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

## CREDITS

**CRNS 292 Independent Projects 1-5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CRNS 293 Independent Projects 1-5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CRNS 294 Independent Projects 1-5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CRNS 296 Work-based Learning Experience 1-18**  
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**CRNS 297 Work-based Learning Seminar 1-2**  
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**CRNS 298 Work-based Learning – No Seminar 1-18**  
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.



**CULINARY ARTS**

**CARTS 101 Introduction to Culinary Arts 2**  
This course is an introduction to the social, historical, and cultural forces that have affected the culinary, baking, and pastry professions.

**CARTS 102 Sanitation and Food Safety 2**  
Students learn food production practices that are governed by changing federal and state regulations. Content includes the prevention of food-borne illness, HACCP procedures, legal guidelines, kitchen safety, facility sanitation, and guidelines for safe food preparation, storage, and reheating. Students take the National Restaurant Association ServSafe examination in this course.

**CARTS 103 Product Identification 2**  
The identification and use of a variety of products includes vegetables, fruits, herbs, nuts, grains, dry goods, prepared goods, dairy products, and spices. Students also learn to identify, receive, store, and hold products.

**CARTS 104 Breakfast Service 2**  
This course includes both theory and lab applications in breakfast preparation with emphasize on the organization and maintenance of a smooth workflow on the breakfast line. Food preparation areas include eggs, quick breads, meat and potatoes, grains, fruit plates, and breakfast beverages.

**CARTS 105 Basic Food Preparation 4**  
This course is an introduction to fundamental cooking theory and preparation. Topics to be presented include tasting, kitchen equipment, knife skills, classic vegetable cuts, thickening agents, timing, station organization, plate development, and French culinary terms.

**CARTS 106 Basic Cooking Techniques 4**  
The application of basic cooking skills includes the preparation and production of a variety of soups, stocks, and grand sauces.

**CARTS 107 Fundamentals of Table Service I 3**  
This course is an introduction to table service principles with emphasis on the physical aspects of table service: types of table service, table settings, and restaurant/dining room setup. Wine, beer, coffee, tea, and non-alcoholic beverage service are also presented.

**CARTS 108 Garde Manger I 1**  
This course introduces students to the preparation methods of cold foods including salads and salad dressings, cold appetizers and buffet items, and vegetable and fruit decorations.

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**CARTS 109 Food Service Mathematics 2**  
Food service math focuses on mathematical concepts and their application in the culinary industry: ratios, percentages, the metric system, conversion factors, yield tests, and recipe costing. Students learn to develop projections and analyze costs in yield tests and recipe pre-costing.

**CARTS 110 Soups and Sauces 4**  
A continuation of the concepts introduced in Fundamentals of Cooking I, this course includes both theory and cooking techniques in product tasting; stock production; stews, broths, and advanced soups. Timing, station organization, and culinary French terminology are also presented.

**CARTS 111 Vegetables, Starches, and Grains 5**  
The application of basic cooking skills includes vegetable cookery by color and family, the production of stews from vegetables and grains. Also included are practical applications used with starches and grains: potatoes, rice, fresh pasta, and dry legumes.

**CARTS 112 Customer Service 3**  
Students learn how to interact professionally with customers and co-workers and to provide quality service in a variety of situations. Emphasis is on the meaning of service, the identification of customers' needs, and the development of strategies to solve customer problems.

**CARTS 113 Introduction to Baking 5**  
This course is an introduction to quick doughs, yeast products, and the basic preparation methods used with pies and cookies.

**CARTS 114 Cost Control 2**  
The course is an introduction to the principles and practices used to determine costs in a restaurant or food service organization. Topics to be presented include menu analysis and determining the cost of food, equipment, and supplies.

**CARTS 115 Food and Beverage Service 3**  
This course is an introduction to all aspects of the food and beverage operation of a restaurant or food service organization. Students learn the procedures for purchasing foods and beverages in quantity and apply those skills when planning, budgeting, and managing inventory.

**CARTS 116 Menu Development 2**  
The creation of menus from the perspective of concept, clarity, cost, price, and efficiency is the focus of this course. Topics to be introduced include menu descriptions, layout, design, and pricing.

CREDITS

**CARTS 117 A la Carte Cooking 5**  
Students receive instruction and practice in advanced cooking methods used to simultaneously prepare vegetables, pastas, starches, proteins, and contemporary sauces. Protein cookery methods such as braising, stewing, roasting, sautéing, broiling, grilling, and poaching are presented. Station organization, plate presentation, and product tasting and evaluation are also included.

**CARTS 118 Introduction to Catering and Banquets 4**  
This course is an introduction to the catering and banquet industry with emphasis on the requirements needed to start an operation and manage its daily operations. Students develop an understanding of the organization and the equipment and responsibilities of the "cold kitchen."

**CARTS 120 Food Truck Fundamentals 3**  
This class will concentrate on understanding licensing requirements and preparing for and operating the food truck.

**CARTS 121 Business Plans for Mobile Food Service 3**  
This course is an introduction to the marketing strategies used to compete effectively in the mobile food service industry. Emphasis is on the development of a comprehensive business plan.

**CARTS 201 Meats and Seafood 3**  
This course is an introduction to a variety of meats, poultry, and seafood used in a food service operation. Students learn to identify, select, and prepare various types of meat, poultry, and fish/shellfish.

**CARTS 202 Global Food and Nutrition Issues 2**  
This course gives students a global perspective of food and nutrition issues that impact our world. Contemporary topics include food production, world-wide food supply and demand, land and water availability for crops and livestock, genetically modified food, food radiation, and technological changes in agriculture.

**CARTS 203 Ice Carving 1**  
Students learn to carve ice sculptures using a variety of stencils.

**CARTS 204 Garde Manger II 2**  
A continuation of the concepts introduced in CARTS 108, students prepare cold foods including salads and salad dressings, cold appetizers and buffet items, and vegetable and fruit decorations.

CREDITS

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**CARTS 205 Restaurant Desserts 5**  
The preparation and service of a variety of hot and cold desserts is emphasized. Students learn to prepare frozen and individually plated deserts as well as desserts for functions and banquets. The development of a dessert menu emphasizing variety, cost, practicality, and compatibility with other menu items is also included.

**CARTS 206 Techniques of Restaurant Cooking 4**  
Basic cooking principles of quantity food preparation is the focus of this course. Skills of efficiency, organization, speed, timing, and quality volume production are also stressed.

**CARTS 207 Catering and Banquets 4**  
In a kitchen/banquet environment, emphasis is on volume food production including preparation, timing, and garnishing of food for banquets. Reception food, buffet arrangements, and plate arrangements are also included.

**CARTS 208 Regional Cuisine Service 3**  
Regional cuisine explores the use of indigenous ingredients in the preparation of traditional and contemporary American specialties. Students prepare, taste, serve, and evaluate traditional regional dishes.

**CARTS 209 International Cuisine Service 3**  
With emphasis on ingredients, flavor profiles, preparation, and techniques, students learn to prepare, taste, serve, and evaluate traditional, regional dishes of the world. Also included is the pairing of wines, beers, and coffees to their respective dishes.

**CARTS 210 Introduction to Management 3**  
This course is an introduction to the various management topics as they relate to a food service establishment: leadership, training, motivation, delegation, problem-solving, decision-making, and conflict resolution.

**CARTS 211 Classical Cuisine 4**  
This course is an introduction to the techniques, ingredients, and spices unique to classical French cuisine. Timing, organization, mise en place, and plate presentation are stressed.

**CARTS 212 Chef's Table Service 5**  
This course prepares students to provide formal service in a variety of elegant settings. Emphasis is on food preparation, service, and plate presentation that reflects artistry and style.

## CREDITS

**CARTS 213 Advanced Culinary Applications 5**  
The application of advanced cooking skills includes vegetable cookery by color and family, the production of stews from vegetables and grains, and advanced soup cookery using broth and bouillon. Also included are practical applications used with starches and grains: potatoes, rice, fresh pasta, and dry legumes.

**CARTS 214 Employment Preparation 2**  
Students develop techniques and strategies for marketing themselves in their chosen fields. Emphasis is on finding a job and then getting and keeping that job.

**CARTS 215 Wine/ Spirits 4**  
This course is an introduction the serving of alcoholic beverages and their appropriate pairing with menu items. Students learn the procedures for purchasing alcoholic beverages and apply those skills when planning, budgeting, and managing bar service.

**CARTS 291 Practical Applications 1-18**  
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CARTS 292 Independent Projects 1-5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CARTS 293 Independent Projects 1-5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CARTS 294 Independent Projects 1-5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

## CREDITS

**CARTS 296 Work-based Learning Experience 1-18**  
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**CARTS 297 Work-based Learning Seminar 1-2**  
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**CARTS 298 Work-based Learning – No Seminar 1-18**  
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

	CREDITS		CREDITS		CREDITS
<b>DATABASE TECHNOLOGY</b>					
<b>DATA 101 Data Modeling\</b>	<b>5</b>				
<b>Relational Database Design</b>					
Using Access, Visio, and other data modeling tools, students learn the concepts and theory of database management systems (DBMS), including the analysis and design of relational database systems, modeling business and scientific problems and normalizing relationships in tables. Prerequisite: DATA 102					
<b>DATA 102 SQL</b>	<b>5</b>				
Students are introduced to Structured Query Language (SQL), the industry-standard language for storing, retrieving, displaying, and updating data in a relational database. They learn to create, update, and delete computer databases. Prerequisite: Program Logic					
<b>DATA 103 Operating Systems</b>	<b>5</b>				
Students are introduced to a variety of operating systems with major emphasis on LINUX in an Oracle database environment. Students learn to install and maintain the operating system.					
<b>DATA 201 PL/SQL</b>	<b>5</b>				
This is an advanced course in Structured Query Language (SQL) used to develop script files, stored procedures, and PL/SQL units in the Oracle DBMS (Database Management System). Skills the student obtain include designing PL/SQL packages and program units and creating, executing, and maintaining procedures, packages, and database triggers. Prerequisite: DATA 102					
<b>DATA 202 Database Fundamentals I</b>	<b>5</b>				
Students learn the key tasks and functions required of a database administrator in a production environment. They learn to create implement a database, manage data, expand the size of the database, implement basic security and data integrity measures, and grant data access privileges. Prerequisite: All 100-level DATA courses or instructor permission					
<b>DATA 203 Database Fundamentals II</b>	<b>5</b>				
This is a project-oriented class with emphasis on system support, tuning, problem diagnosis, and problem resolution. Students learn to anticipate, diagnose, and resolve a variety of performance problems using real-world scenarios. Prerequisite: DATA 202					
<b>DATA 204 Database Fundamentals III</b>	<b>5</b>				
This is a project-oriented class with emphasis on integrating all of the database administration skills learned in the previous database courses. Database certification exams are emphasized during this course. Prerequisite: DATA 203					
<b>SOFT 204 Open Source Programming</b>	<b>5</b>				
This course leverages the knowledge gained in previous courses in do development in an open source environment. Students will work in a Linux environment and utilize an open source programming language and open source database software. Prerequisites SQL, Operating System and JAVA II.					
<b>DATA 290 Capstone Project</b>	<b>5</b>				
This course offers students an opportunity to work independently on a culminating project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.					
<b>DATA 291 Practical Applications</b>	<b>1-18</b>				
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.					
<b>DATA 292 Independent Projects</b>	<b>1-5</b>				
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.					
<b>DATA 293 Independent Projects</b>	<b>1-5</b>				
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.					
<b>DATA 294 Independent Projects 20-100</b>	<b>1-5</b>				
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.					
<b>DATA 296 Work-based Learning Experience</b>	<b>1-18</b>				
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.					
<b>DATA 297 Work-based Learning Seminar</b>	<b>1-2</b>				
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.					
<b>DATA 298 Work-based Learning – No Seminar</b>	<b>1-18</b>				
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.					

## CREDITS

**DENTAL ASSISTING****DNTA 110 Introduction to Dental Assisting 2**

This course is an introduction to the dental assisting profession including the role of the dental assistant in the dental office, legal and ethical considerations, HIPPA regulations, and dental equipment and terminology. Prerequisite: Must be admitted into the Dental Assisting program.

**DNTA 111 Infection Control 5**

This course is an introduction to microbiology, and the application of standard infection control practices including aseptic techniques in the dental office. Infection control, hazardous waste management and safety standards are emphasized. Prerequisite: Must be admitted into the Dental Assisting program.

**DNTA 112 Biomedical Sciences 5**

This course is an introduction to the biomedical sciences and their application to the dental assisting industry: anatomy and physiology, embryology, histology, and morphology. Prerequisite: Must be admitted into the Dental Assisting program.

**DNTA 114 Dental Sciences I 4**

Students are introduced to the fundamentals of oral health and preventative techniques, oral pathology, pediatric dentistry, nutrition, and pharmacology. Prerequisite: Must be admitted into the Dental Assisting program.

**DNTA 120 Introduction to Chairside Assisting 4**

Students are introduced to the fundamentals of chairside assisting including patient management, assessment of the patient's medical health history, medical emergencies, and the student's role in patient care. Prerequisite: Must be admitted into the Dental Assisting program.

**DNTA 121 Chairside Assisting I 4**

Students are introduced to the fundamentals of chairside assisting including recording dental chart information, instrument transfer, maintaining the operating fields, coronal polish, apply dental sealants, and the skills necessary to assist in the delivery of dental services to patients in a pre-clinical environment. Prerequisite: Must be admitted into the Dental Assisting program.

**DNTA 122 Dental Materials I 3**

This course is an introduction to fixed and removable prosthodontics with instruction in the physical properties and manipulation of dental materials used in diagnostic and prosthetic procedures. Fabrication of study models and the manipulation of gypsum products are emphasized. Prerequisite: Must be admitted into the Dental Assisting program.

## CREDITS

**DNTA 124 HIV/AIDS Training 1**

Approved Washington State Department of Health mandated HIV/AIDS training course. Prerequisite: Must be admitted into the Dental Assisting program.

**DNTA 127 Office Administration 3**

Students learn the basic business administration skills necessary to manage a dental office. Customer service, appointment scheduling, patient files, record management, maintaining and inventory system, and familiarization with dental software programs are included. The use of mathematics to maintain records and accounts is emphasized.

Prerequisite: Must be admitted into the Dental Assisting program.

**DNTA 128 Dental Sciences II 3**

An introduction to various dental sciences to include; dental radiography, selected specialty procedures, dental dam, and restorative procedures. Prerequisite: Successful completion of the first trimester.

**DNTA 130 Dental Sciences III 3**

This course is continuation of the various dental sciences to include; dental anesthesia, cavity classification and rotary instruments. Prerequisite: Successful completion of the first trimester.

**DNTA 131 Chairside Assisting II 3**

A continuation of the concepts introduced in DNTA 121, students learn to process new patients, chart information, and prepare rotary instruments. Students learn more advanced chairside skills including identification of hand instruments and tray set-ups. Prerequisite: Successful completion of the first trimester.

**DNTA 134 Chairside Assisting III 3**

Students learn to apply dental dams and prepare anesthetics. Prerequisite: Successful completion of the first trimester.

**DNTA 139 Restorative Services I 5**

This course is an introduction to the materials and techniques used in the preparation and use of common restorative materials. Students learn to place and remove matrix and wedges. This course is an introduction to materials and techniques used to place temporary restorations. Prerequisite: Successful completion of the first trimester.

**DNTA 144 Dental Radiology 5**

An advanced course in dental radiography. Students learn both theory and practical applications in the area of production radiation including the taking and processing of dental x-rays. Content also covers digital radiography, quality assessment, and technique errors. Students will mount and evaluate full mouth series of radiographs using the paralleling and bisecting techniques. Radiographs are exposed on manikins and lab patients. Prerequisite: Successful completion of the first trimester.

## CREDITS

**DNTA 146 Chairside Assisting IV 5**

An advanced chairside assisting course related to restorative procedures and selected specialty procedures. Prerequisite: Successful completion of the first trimester.

**DNTA 147 Dental Materials II 3**

Students learn advanced techniques in fixed and removable prosthodontics, including the manipulation of final impression materials, fabrication of a variety of provisional crowns, and the cementation of fixed appliances. Prerequisite: Successful completion of the first trimester.

**DNTA 150 Dental Sciences IV 3**

An introduction to the specialties of oral surgery and orthodontics. This course will include background, procedures and instrumentation. Prerequisite: Successful completion of the second trimester.

**DNTA 151 Clinical Experience I 5**

Students are assigned to off campus dental offices in the community or the Bates Dental Clinic. Clinical assignments are designed to enhance students' competence in performing dental assisting functions with emphasis on chairside assisting, radiograph technique, patient management skills, and professionalism. General Dentistry is emphasized. Weekly journals are required and seminars are held to evaluate and review clinical application. Prerequisite: Successful completion of the second trimester.

**DNTA 152 Dental Materials III 4**

This course has emphasis on the fabrication of a variety of provisional crowns as well as defining and describing aspects of cosmetic dentistry. Prerequisite: Successful completion of the second trimester.

**DNTA 153 Office Administration Applications 2**

Students learn the basic business administration skills necessary to manage a dental office. Financial systems to include employee records management will be introduced. The use of mathematics to maintain records and accounts is emphasized. Interview techniques will be reviewed and resumes will be prepared. Prerequisite: Successful completion of the second trimester.

**DNTA 162 Clinical Experience II 3**

A continuation of the student's clinical experience. Students acquire clinical practice to perfect their skills in performing dental assisting functions including expanded functions. General Dentistry is emphasized. Weekly journals are completed and seminars are held to evaluate and review clinical applications. Prerequisite: Successful completion of DNTA 151.

	CREDITS
<b>DNTA 165 Clinical Experience III</b>	<b>2</b>
A continuation of the student's clinical experience, students continue their clinical practice to perfect their skills in performing dental assisting functions including expanded functions. General Dentistry or Specialty Dentistry is emphasized. Weekly journals are completed and seminars are held to evaluate and review clinical applications. Prerequisite: Successful completion of DNTA 151 and DNTA 162.	
<b>DNTA 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>DNTA 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>DNTA 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>DNTA 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>DNTA 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	

	CREDITS
<b>DNTA 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>DNTA 298 Work-based Learning—No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

CREDITS

## CREDITS

**DENTAL LAB TECHNICIAN**

**Program Requirements:** A minimum GPA of 2.0 must be obtained in all DENLB courses before progressing on to the new quarter.

**DENLB 101 Introduction to Dental Lab Technology 2**

This course is an introduction to basic concepts of the dental laboratory industry: terminology, identification, weights and measures, health & safety practices, and the use of dental tools/machinery.

**DENLB 102 Dental Anatomy I 3**

This course is an introduction to tooth tissues and edentulous anatomy. The student will also learn tooth morphology and annotation. Prerequisite: DENLB 101 or instructor permission

**DENLB 103 Dental Materials I 3**

This course is an introduction to the various materials used in the first year of the dental laboratory program to include impression materials, gypsum products, waxes, separating mediums and resin materials. Prerequisite: DENLB 102 or instructor permission

**DENLB 104 Denture Processes I 4**

This course is designed to provide students with an introduction to the first laboratory processes involved in complete denture construction. The student will evaluate preliminary and final edentulous impressions, construct custom trays, baseplates and occlusal rims, and identify types and uses of articulators. Prerequisite: DENLB 103 or instructor permission

**DENLB 105 Denture Processes II 4**

This course is an introduction to the articulation, tooth selection, and arrangement of denture teeth, Festooning through deflasking, selective grinding, and the fabrication of the students first complete denture. Prerequisite: DENLB 104 or instructor permission

**DENLB 106 Dental Anatomy II 2**

This course is an introduction to the skeletal and muscular anatomy of the head and oral cavity. The student will also learn about the temporomandibular joint and how it functions. Prerequisite: DENLB 105 or instructor permission

**DENLB 107 Denture Processes III 4**

This course introduces the student to the fabrication techniques of an immediate denture, denture repairs, relines & rebases. Prerequisite: DENLB 106 or instructor permission

## CREDITS

**DENLB 108 Denture Processes IV 3**

This course introduces the student to advanced concepts of esthetic tooth arrangement techniques that produce high quality dentures that enhance the age, sex, and personality of the individual patient. Prerequisite: DENLB 107 or instructor permission

**DENLB 110 Introduction to Orthodontics 3**

This course is an introduction to the various classifications of mal-occlusion, the fundamentals of wire bending, soldering, and orthodontic study models. Prerequisite: DENLB 108 or instructor permission

**DENLB 111 Orthodontic Appliances—Fixed 3**

This course introduces the student to the fabrication of fixed orthodontic holding appliances that are temporarily cemented in the mouth by the dentist. Prerequisite: DENLB 110 or instructor permission

**DENLB 112 Orthodontic Appliances—Removable 3**

This course introduces the student to the fabrication of removable orthodontic appliances that maintain tooth position and promote arch development. In addition the student will learn various repair techniques on these appliances. Prerequisite: DENLB 111 or instructor permission

**DENLB 120 Removable Partial Dentures I 3**

This course is an introduction to removable partial dentures. The student will learn the various classifications, design theory, survey techniques, and components for removable partial denture construction. In addition, the student will learn digital scanning and design techniques. Prerequisite: DENLB 112 or instructor permission

**DENLB 121 Removable Partial Dentures II 3**

This course is the step by step process of preparing the master cast for partial denture construction. The student will learn model block out, duplication, refractory cast production, design transfer, wax up, and spring through finishing. The student will then fabricate a Class I RPD framework. Prerequisite: DENLB 120 or instructor permissions.

**DENLB 122 Removable Partial Dentures III 4**

The student will build on the knowledge gained in DENLB 120 and 121 by fabricating a metal lingual bar, Kennedy bar, palatal strap, and closed horseshoe removable partial denture framework. Prerequisite: DENLB 121 or instructor permission

**DENLB 123 Removable Partial Dentures IV 3**

In this course the student will set teeth on an upper and lower removable partial denture fabricated in DENLB 122. They will then process with an acrylic base and finish. In addition, the student will learn relines, repair, and rebase techniques for removable partial denture frameworks. Prerequisite: DENLB 122 or instructor permission

**DENLB 124 Advanced Dentures 3**

In this course students will apply the theoretical knowledge and their experience with the step-by-step process of an advanced denture using their basic learning skills. Prerequisite: DENLB 123 or instructor permission

**DENLB 125 Advanced Orthodontics 3**

In this course students will apply the theoretical knowledge and their experience with the step-by-step process of an advanced orthodontic appliance using their basic learning skills. Prerequisite: DENLB 123 or instructor permission

**DENLB 126 Advanced RPD's 3**

In this course students will apply the theoretical knowledge and their experience with the step-by-step process of making an advanced Removable Partial Denture using their basic learning skills. Prerequisite: DENLB 123 or instructor permission

**DENLB 201 Tooth Morphology Practicum 5**

This course is designed to provide the student with a practical study of the individual teeth. Students will draw the individual teeth to scale from the linek manual. The student will also learn to build up tooth form with various colors of waxes to recognize how the anatomy of the natural tooth relates to each other and the overall form of the tooth. Prerequisite: DENLB 124/125/126 or instructor permission

**DENLB 202 Dental Materials II 2**

This course introduces the student to materials that are used in fixed restorations. Students will be introduced to the basics of chemistry by learning about metallurgy and their chemical and physical properties. Additionally, the student will gain an understanding of weights, measures, and calculations, processing of alloys, metal treatment and torch techniques as well as metal sensitivities. The student will then be introduced to porcelain, its chemical composition, properties, application, and manufacturing. Prerequisite: DENLB 201 or instructor permission

## CREDITS

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<b>DENLB 203 Fixed Prosthodontics I</b>	<b>5</b>
This course introduces the student to the theory and practice of fabricating individual metal crowns. The student will learn the steps involved in fabricating gold inlays, onlays, & crowns. In addition, the student will be introduced to digital scanning and design techniques learning the basic tools. Prerequisite: DENLB 202 or instructor permission	
<b>DENLB 204 Principles of Occlusion</b>	<b>2</b>
This course is designed to provide the student with an introduction to the principles of occlusion, including the anatomical structures of the oral cavity, the determinants of occlusal morphology, malaligned teeth versus ideal teeth and the physiology of mandibular movements as they relate to the fabrication of dental restorations. Prerequisite: DENLB 203 or instructor permission	
<b>DENLB 205 Fixed Prosthodontics II</b>	<b>5</b>
This course is designed to provide the step-by-step procedures in fabricating metal bridges, post-soldering, fabricating provisionals, & fabrication of reduction copings. Prerequisite: DENLB 204 or instructor permission	
<b>DENLB 206 Ceramics I</b>	<b>2</b>
An introduction to the theory and practice of fabricating fixed porcelain prosthesis. The student will learn about the history of ceramics with old technologies as well as new technologies such as layering a Zirconia coping, Emax, and titanium copings. The student will fabricate modelwork for their ceramic units. Prerequisite: DENLB 205 or instructor permission	
<b>DENLB 207 Understructure Design</b>	<b>5</b>
This course is an introduction to the understructure design for porcelain fused to metal crowns, waxing, and porcelain margin cut back, investing, & finishing the alloy for preparation for porcelain In addition; the student will be introduced to digital scanning and design techniques learning the basic tools. Prerequisite: DENLB 206 or instructor permission	
<b>DENLB 208 Ethics, Jurisprudence &amp; Laboratory Management</b>	<b>3</b>
This course is designed to provide the student with the history of the dental profession, the legal obligations of the dental technician under State Dental Practice Acts, ethical responsibilities of the technician towards the dental profession, and the fundamentals of the day to day operation of a dental laboratory. Prerequisite: DENLB 207 or instructor permission	

	CREDITS
<b>DENLB 209 Ceramics II</b>	<b>5</b>
This course will assist the student in following the step by step processes in the application of porcelain to metal understructure. The student will also learn about color in dentistry and taking shades. Prerequisite: DENLB 208 or instructor permission	
<b>DENLB 211 Ceramic III</b>	<b>4</b>
This course will assist the student in following the step by step processes in the fabrication of Emax pressable porcelain crowns & veneers. In addition, the student will be introduced to digital scanning and design techniques learning the basic tools. Prerequisite: DENLB 209 or instructor permission	
<b>DENLB 212 Computer Aided Design/Computer Aided Manufacturing CAD/CAM</b>	<b>5</b>
This course is an introduction to the theory and practice of fabricating dental prosthetics digitally with an understanding of the various systems available as it pertains to open and closed architecture. Students will also learn a general understanding about material selection for the final prostheses. They will gain an understanding by digitally manipulating and morphing teeth, importing and exporting stl. digital files, nesting and computer aided manufacturing of digital design fabrications. The student will learn to use more complex tools in computer aided design and manufacturing of individual copings and full wax units. Prerequisite: DENLB 211 or instructor permission	
<b>DENLB 213 Advanced Technologies</b>	<b>4</b>
In this course students will apply the theoretical knowledge and their experience with the step-by-step process of an advanced project using two of their basic learning skills. Prerequisite: DENLB 212 or instructor permission	
<b>DENLB 214 Advanced Crown and Bridge</b>	<b>3</b>
In this course students will apply the theoretical knowledge and their experience with the step-by-step process of an advanced project using their basic learning skills. Prerequisite: DENLB 212 or instructor permission	
<b>DENLB 215 Advanced Dental Ceramics</b>	<b>3</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. Prerequisite: DENLB 212 or instructor permission	

	CREDITS
<b>DENLB 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. Prerequisite: DENLB 212 or instructor permission	
<b>DENLB 296 Work-based Learning Experience 1</b>	<b>1</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>DENLB 297 Work-based Learning Seminar 3</b>	<b>3</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meets with the students to provide support and assistance during the experience.	
<b>DENLB 298 Work-based Learning—No Seminar</b>	<b>4</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

	CREDITS		CREDITS		CREDITS
<b>DENTURIST</b>					
DNTU 101 Asepsis, Infection, Hazard Control	2	DNTU 112 Medical Emergencies	3	DNTU 127 Dental Impressions Procedures II	2
Students train in safety procedures including OSHA/ WSHA and infection control compliance for denturist's offices and laboratories. This includes a special emphasis on the materials, hazardous materials, interpreting MSDS's, equipment, and procedures mandated in the dental environment for protection of staff and patients from infection by infectious disease organisms.		Students demonstrate first aid and CPR procedures in simulated situations. This includes the provider CPR/ first aid course. Health histories are taken and analyzed for information important patient care.		Student perform impressions, bite registrations and proper mounting on clinical cases assigned during this semester	
DNTU 102 Biological Concepts	3	DNTU 114 Clinical Denture Fabrication	1	DNTU 128 Fabrication Clinical II	1
Students study cell biology, microbiology, developmental embryology, and histology with an emphasis on the oral cavity		Students learn to process denture and partials cases as well as pre-insertion procedures.		Students complete the required clinical cases assigned to them this semester.	
DNTU 103 Introduction to Complete Denture Prosthodontics	3	DNTU 115 Partial Dental Casts	2	DNTU 129 Polish Methods – RDP Frames	1
This course covers the basic anatomy of the residual ridge as well as primary and final impressions of these ridges using the proper materials and trays. Impressions are poured and trimmed with proper materials and techniques.		Students are introduced to the area of removable partial dentures including theory, clinical classification, and evaluation.		Students learn proper techniques to fit, adjust, and polish frameworks prior to processing.	
DNTU 104 Baseplates and Occlusion Rims	2	DNTU 116 Framework Design - RPD	3	DNTU 131 Wax Patterns - Partial	4
Students fabricate base plates and rims using various materials in preparation for setting teeth		Students learn to survey study models and design practical cases.		Students perform framework waxups on assigned practical cases.	
DNTU 105 Tooth Selection and Set I	3	DNTU 117 Dental Office Management II	2	DNTU 132 Teeth Arrangement - RPD	2
Students learn proper tooth selection and ordering techniques and then start their required lab setups.		Students learn proper scheduling, billing, and HIPAA privacy requirements.		Students learn to set teeth in partials opposing dentures, other RPDs or natural teeth.	
DNTU 106 Dental Materials I	2	DNTU 118 Clinical Denture Procedures I	2	DNTU 233 Finish Methods - RPD	1
This course discusses the various acrylics and materials involved in the processing and finishing of patient appliances.		Students learn proper room setup and teardown procedures for clinical cases along with clinical instrument processing.		Students learn to properly flask, process, and remount RPD cases in preparation for insertion.	
DNTU 107 Denture Techniques	2	DNTU 119 Dental Impressions Procedures I	2	DNTU 135 Introduction to Oral Pathology	3
This course covers the wax up, processing, and other lab steps needed to supply a proper prosthesis for a patient.		Clinical impressions are performed on patient cases assigned by instructors.		Students finish their study of various oral pathologies and learn how to do proper referrals and consultations.	
DNTU 108 Denture Fabrication I	2	DNTU 120 Head Anatomy and Physiology II	3	DNTU 136 Clinical Denture Procedures III	2
Students complete waxups and flasking of practice cases in complete and partial dentures.		This course completes the remaining anatomical systems not covered in DNTU 110.		Students perform the required lab work on assigned patient cases.	
DNTU 109 Dental Office Management I	1	DNTU 121 Tooth Selection and Set III	1	DNTU 138 Fabrication Clinical III	2
Students learn proper patient record keeping and individual policy and informational hand outs are completed in preparation for actual clinical cases.		Students complete their required practice lab setups.		Students complete the required clinical cases assigned them during this semester.	
DNTU 110 Head Anatomy and Physiology I	2	DNTU 123 Complete Denture Repair I	2	DNTU 201 Complete Denture Repair II	2
Students are introduced to the anatomy and physiology of the head, neck, temporomandibular joint, muscles, nerves, blood vessels, lymphatic system, skeletal system, digestive system, and dental anatomy related to sinuses, glands, teeth, periodontal structures, and other oral structures.		Students complete denture repairs on practical and clinical cases.		Students learn the proper techniques used to accomplish complex repairs on dentures.	
DNTU 111 Tooth Selection and Set II	1	DNTU 124 Casts - Partial	2	DNTU 203 RPD Repair Methods	3
A continuation of the concepts introduced in DNTU 105, students practice with further required lab setups.		After completing cast designs, students learn and perform proper block-out techniques in preparation for cast duplication of practical cases.		Students learn those techniques unique to partial dentures.	
		DNTU 125 Oral Pathology	2	DNTU 204 Dental Office Management IV	2
		Continuation of DNTU 135. Students learn what are normal findings and abnormal findings needing referral. Students learn the causes of clinically evident pathology; including infection, developmental disorders, nutritional and metabolic disorders, trauma and outside irritants. Radiographic findings are studied where applicable as well as passing written exams		Students continue to manage all office aspects of their patient cases to include scheduling appointments, record keeping, billing, and behavior management, where possible, toward the completion of their patient cases.	
		DNTU 126 Clinical Denture Procedures II	2	DNTU 205 Denture Adjustments	1
		Students perform the required lab and clinical work on assigned patient cases toward their program completion.		Students perform post –insertion adjustments of their clinical cases as needed.	
				DNTU 206 Ethics and Jurisprudence	1
				In this course, federal and state laws are discussed as they relate to licensing. Ethics pertaining to a licensed healthcare professional are discussed.	



	CREDITS
<b>DNTU 207 Malocclusions</b>	<b>2</b>
Students study different occlusal schemes and perform face-bow remounts and occlusal corrections of clinical cases where needed.	
<b>DNTU 208 Clinical Denture Procedures IV</b>	<b>2</b>
Students continue to complete their clinical cases and are given opportunities to practice unique, specialized technique found in industry.	
<b>DNTU 210 Geriatric Patient Needs</b>	<b>3</b>
Students learn the many unique requirements of the geriatric patient, both physically and psychologically.	
<b>DNTU 211 Fabrication Clinical IV</b>	<b>2</b>
Students complete their remaining clinical cases to reach the minimum required number.	
<b>DNTU 212 Alternative RPD Systems</b>	<b>2</b>
Alternatives to metal framework RPDs are discussed in the course.	
<b>DNTU 213 Implant and Precision Attachments</b>	<b>1</b>
Students study the history of implants and the numerous systems available for use.	
<b>DNTU 214 Advanced Special Services</b>	<b>1</b>
Students learn advanced concepts and techniques related to denture practices and non-orthodontic appliances	
<b>DNTU 215 Advanced Dental Appliances</b>	<b>1</b>
Students discuss and when available work on advanced cases such as gasket retained dentures, swing -lock and dual-path RPDs.	
<b>DNTU 220 Dental Office Management V</b>	<b>2</b>
Students continue to manage all office aspects of their patient cases to include scheduling appointments, record keeping, billing, and behavior management, where possible, toward the completion of their patient cases.	
<b>DNTU 222 Fabrication Clinic V</b>	<b>3</b>
Students insert and make all appropriate adjustments to their assigned patient cases to bring finishing with a total of ten patient cases.	
<b>DNTU 223 Dental Office Management VI</b>	<b>2</b>
Students insert and make all appropriate adjustments to their assigned patient cases to bring finishing with a total of ten patient cases.	
<b>DNTU 229 Clinical Denture Procedures V</b>	<b>2</b>
Students continue to complete their clinical cases and are given opportunities to practice unique, specialized techniques found in industry	

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<b>DIESEL/HEAVY EQUIPMENT MECHANIC</b>	
<b>DIESEL 103 Introduction to Hydraulic Systems</b>	<b>5</b>
This course is an introduction to hydraulic/pneumatic theory, component design, and service practices for hydraulic systems. This includes instruction in pumps, motors, valves, safety, seals, cylinders, and filters. Concurrent enrollment: DIESEL 104	
<b>DIESEL 104 Diagnosis and Testing of Hydraulic Systems</b>	<b>2</b>
A continuation of the concepts introduced in DIESEL 103, students learn to diagnose and test a variety of hydraulic components and systems. Concurrent enrollment: DIESEL 103	
<b>DIESEL 105 Introduction to Diesel Technology</b>	<b>1</b>
This course is an introduction to the diesel industry with emphasis on occupational safety principles and WISHA and Department of Ecology guidelines. Concurrent enrollment: DIESEL 103, 104, 106, 107, 108, and 109 or instructor permission.	
<b>DIESEL 106 Engine Construction</b>	<b>5</b>
This course is an introduction to basic engine theory and operation and their application to the maintenance and repair of gasoline and diesel engine systems common to heavy equipment. Concurrent enrollment: DIESEL 103, 104, 105, 107, 108, and 109 or instructor permission.	
<b>DIESEL 107 Engine Systems</b>	<b>1</b>
A continuation of the concepts introduced in DIESEL 106, students learn to identify engine systems and their component parts. Concurrent enrollment: DIESEL 103, 104, 105, 106, 108, and 109 or instructor permission.	
<b>DIESEL 108 Engine Reassembly</b>	<b>4</b>
Students perform procedures for overhauling heavy-duty diesel engine including disassembly, cleaning and inspection, adjustments, and reassembly. Concurrent enrollment: DIESEL 103, 104, 105, 106, 107, and 109 or instructor permission.	
<b>DIESEL 109 Fuel Systems</b>	<b>2</b>
This course is an introduction to hydro-mechanical and electronic diesel fuel systems with emphasis on the analysis of fuel system components and system operational characteristics. Concurrent enrollment: DIESEL 103, 104, 105, 106, and 107 or instructor permission.	
<b>DIESEL 110 Introduction to Air Brakes</b>	<b>2</b>
The operating principles of pneumatic brakes including ABS, roll stability, and collision avoidance are presented.	

	CREDITS
<b>DIESEL 111 Introduction to Basic Electrical Systems</b>	<b>4</b>
Students are introduced to the fundamentals of electricity and its application in the diesel and heavy equipment industry. The uses of specialty equipment to troubleshoot and repair are included with emphasis on industry safety requirements and the use of protective devices. Concurrent enrollment: DIESEL 112 or instructor permission	
<b>DIESEL 112 Electrical Systems Application</b>	<b>4</b>
Practical applications include working with cranking circuits, type A & B charging circuits, conventional and electronic spark ignition, component operation, testing and industry-required repairs. Concurrent enrollment: DIESEL 111 or instructor permission	
<b>DIESEL 113 Electronic Engine Systems</b>	<b>3</b>
Students are introduced testing of common input and output electronic components and to use specialty tools and equipment used for code retrieval; service processes and repair are introduced. Concurrent enrollment: DIESEL 111 and 112 or instructor permission.	
<b>DIESEL 114 Mobile Air Conditioning Systems</b>	<b>3</b>
Students are introduced to the EPA 609 requirements with emphasis on the achievement of certification. Component identification, operation, testing, and repair methods to meet industry regulations are included. Concurrent enrollment: DIESEL 111, 112, 113, or instructor permission.	
<b>DIESEL 115 Introduction to Power Trains</b>	<b>1</b>
This course is an introduction to the Power Trains Program. Emphasis is given to shop and tool safety, and the fundamentals of precision measurements and fasteners.	
<b>DIESEL 116 Manual Transmission Service</b>	<b>3</b>
Students provide fundamental transmission service on single and twin countershaft transmissions including disassembly, failure analysis, preventive remedies and reassembly to OEM specifications. Concurrent enrollment: DIESEL 115, 117, 118, 119, 120, 121, 122 or instructor permission.	
<b>DIESEL 117 Automated Manual Transmission Service</b>	<b>2</b>
Students are introduced to design characteristics, operation and basic troubleshooting of automated manual transmissions. Concurrent enrollment: DIESEL 115, 116, 118, 119, 120, 121, 122 or instructor permission.	
<b>DIESEL 118 Clutch Service</b>	<b>2</b>
Students learn the fundamentals of medium and heavy duty clutch operation, diagnosis of various symptoms and causes of clutch failures and provide remedies to prevent future failures. Concurrent enrollment: DIESEL 115, 116, 117, 119, 120, 121, 122 or instructor permission.	

	CREDITS
<b>DIESEL 119 Automatic Transmission Service 2</b>	<b>2</b>
Students gain a fundamental understanding of automatic and power shift transmissions and torque converters including the basics of operation, design characteristics and failure analysis of both hydro-mechanical and electronically controlled units. Concurrent enrollment: Diesel 115, 116, 117, 118, 120, 121, 122 or instructor permission.	
<b>DIESEL 120 Driveline Service</b>	<b>1</b>
Students gain a fundamental understanding of the principles of operation, maintenance procedures, and analysis of vibrations for driveline systems. Concurrent enrollment: Diesel 115, 116, 117, 118, 119, 121, 122 or instructor permission.	
<b>DIESEL 121 Differentials/ Final Drive</b>	<b>2</b>
Students provide fundamental differential/final drive system service including disassembly, failure analysis, and reassembly to O.E.M. specifications. The various styles, applications, and operation of mechanical final drives used in construction and agricultural equipment are also included. Concurrent enrollment: Diesel 115, 116, 117, 118, 119, 120, 122 or instructor permission.	
<b>DIESEL 122 Wheel End Service</b>	<b>1</b>
Students learn the correct inspection and installation procedures for standard and unitized wheel ends used on heavy duty trucks. Concurrent enrollment: Diesel 115, 116, 117, 118, 119, 120, 121 or instructor permission. NOTE: Students must complete 100-level coursework with a cumulative 2.0 GPA before continuing into the 200-level coursework.	
<b>DIESEL 201 Basic Vehicle Service</b>	<b>11</b>
Course emphasis is on the theory and practices for the tune up and troubleshooting of diesel engines including air, fuel, lube and cooling systems.	
<b>DIESEL 203 Advanced Service Applications</b>	<b>5</b>
Students apply their understanding of various systems, the relationship between systems, their components, and the procedures for providing service to engines and fuel systems, power trains, hydraulic systems, electrical systems, air conditioning and refrigeration systems, and the procedures for performing periodic maintenance.	
<b>DIESEL 204 Employment Preparation</b>	<b>2</b>
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.	

	CREDITS
<b>DIESL 205 Advanced Service Techniques</b>	<b>15</b>
Student demonstrate capabilities to inspect (troubleshoot, analyze/diagnose, test), remove and repair or replace components or systems to within manufacturer's specifications. Service and preventive maintenance techniques are applied to the following systems: engines and fuel systems, power trains, hydraulic systems, electrical systems, and air conditioning and refrigeration systems.	
<b>DIESL 252 Special Projects</b>	<b>5</b>
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.	
<b>DIESL 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>DIESL 292 Independent Projects</b>	<b>1-5</b>
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.	
<b>DIESL 293 Independent Projects</b>	<b>1-5</b>
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.	
<b>DIESL 294 Independent Projects</b>	<b>1-5</b>
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.	

	CREDITS
<b>DIESL 296 Work-based Learning Experience</b>	<b>14</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>DIESL 297 Work-based Learning Seminar</b>	<b>1</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>DIESL 298 Work-based Learning – No Seminar</b>	<b>15</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

## DIGITAL MEDIA

	CREDITS
<b>DIGIT 101 Digital Imaging</b>	<b>2</b>
Students learn to create and enhance digital images using a scanner and digital imaging software.	
<b>DIGIT 102 Image Editing</b>	<b>5</b>
Students learn to edit and manipulate digital images using several image-editing applications.	
<b>DIGIT 103 Graphic Generation I</b>	<b>5</b>
This course is an introduction to the various techniques used to set up and operate various graphic generation devices: character generators, paint box generators, and still-store devices.	
<b>DIGIT 104 Introduction to Computers</b>	<b>5</b>
Students are introduced to digital media concepts featuring digital media hardware and software tools and techniques, survey of digital media applications, and issues relating to the use of digital media. They learn to use text, graphics, audio, video, animation, and interactivity in a project.	
<b>DIGIT 120 Introduction to Digital Media Concepts</b>	<b>4</b>
This course is an introduction to the methods used to communicate ideas through the use of computer-based interactive multimedia technology.	
<b>DIGIT 121 Production Process I</b>	<b>5</b>
The production process and various program formats are presented. The computers and software used to develop storyboards, budgets, fact documents, time-lines, and schedules is also presented.	
<b>DIGIT 122 Production Process II</b>	<b>4</b>
Students learn to create various forms of production materials from idea to the finished project: public service announcements (PSA), commercials, news stories, and music videos.	
<b>DIGIT 123 Production Process III</b>	<b>4</b>
Students initiate and complete a variety of media projects (CD ROM, video, web) using advanced production process skills.	
<b>DIGIT 130 Production Editing I</b>	<b>3</b>
This course is an introduction to the methods used to set up editing and support equipment to edit on machine-to-machine systems as well as computer controlled "AB roll" systems.	
<b>DIGIT 131 Production Editing II</b>	<b>3</b>
A continuation of the concepts introduced in DIGIT 131, students apply advanced editing skills to a variety of equipment and systems.	

	CREDITS
<b>DIGIT 132 Digital Media – Video</b>	<b>5</b>
This course is an introduction to the fundamentals of digital video, video recording, video processing, video delivery, and the incorporation of digital video into a computer-based media project.	
<b>DIGIT 133 Advanced Editing Project</b>	<b>5</b>
Students conduct and complete an advanced digital editing project for a datacast application.	
<b>DIGIT 140 Copyright and Ethics</b>	<b>2</b>
This course is an introduction to the legal and ethical concepts of copyright issues as they pertain to the broadcast/datacast industry.	
<b>DIGIT 141 Desktop Presentations I</b>	<b>5</b>
This course is an introduction to the methods used to apply visual elements, edit, and modify presentations.	
<b>DIGIT 142 Desktop Presentations II</b>	<b>5</b>
A continuation of the concepts introduced in DIGIT 141, student apply advanced methods to create and modify presentations.	
<b>DIGIT 143 Digital Media – Animation</b>	<b>5</b>
Students learn to add motion to digitally produced images to enhance the intent of a computer-based project.	
<b>DIGIT 145 Digital Media – Audio</b>	<b>5</b>
This course is an introduction to the fundamentals of digital sound, sound recording, sound processing, sound delivery, and the incorporation of sound into a computer-based media project.	
<b>DIGIT 210 Pre-Production Project I</b>	<b>5</b>
This course will provide the student the opportunity to plan a series of self-designed projects using digital media terms, processes and the student's individual creativity. This course will help build self-responsibility to the creative process, inspire independent thinking, and provide opportunity to use tools like mood boards, scripts and storyboards.	
<b>DIGIT 211 Production project I</b>	<b>5</b>
Students complete a series of practical digital media productions related to the pre-production process designed in Digit 210. Student will create and use scheduling, on set protocols, camera or animation software to produce a series of digital media packages.	
<b>DIGIT 212 Post-production I</b>	<b>5</b>
This course will provide the student the opportunity to edit a series of digital media projects they have produced. Students will build post production skills such as file management, storytelling elements, audio mixing and color correction application.	

	CREDITS
<b>DIGIT 220 Pre-Production Project II</b>	<b>5</b>
This course will provide the student the opportunity to refine their pre-production process with a series of digital media projects. Students can choose from a list of commonly designed digital media content. Students will learn the planning differences between social media, television commercials and content marketing materials.	
<b>DIGIT 221 Production Process Project II</b>	<b>5</b>
Students complete a series of practical digital media productions related to the pre-production process designed in Digit 220. Student will use their experiences from 211 to refine the production process, use studio of field lighting and audio to complete their productions.	
<b>DIGIT 222 Post-Production II</b>	<b>5</b>
This course will provide the student the opportunity to edit a series of digital media projects produced in Digit 211. Students will build post production skills such as mastering the audio stems, ad graphic titles and animations while utilizing the latest digital media software.	
<b>DIGIT 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>DIGIT 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>DIGIT 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>DIGIT 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	

	CREDITS
<b>DIGIT 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>DIGIT 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>DIGIT 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

	CREDITS		CREDITS		CREDITS
<b>EARLY CHILDHOOD EDUCATION</b>					
<b>ECE 101 Introduction to Child Care / Early Education</b>	<b>5</b>	<b>ECE 107 Physical Development</b>	<b>4</b>	<b>ECE 202 Children with Special Needs</b>	<b>5</b>
This course is an introduction to the personal and professional standards of ethical conduct, philosophies, and developmental theories related to the nurturing and teaching of young children.		The developmental sequence of children's physical skills introduced with emphasis on the equipment used to foster gross and fine motor skills and enhance sensory development.		This course is an introduction to the characteristics and assessment of children with special needs and strategies for adapting the learning environment. Working with the child, family, and supportive community/educational agencies and the implications of the Americans with Disabilities Act (ADA) for Child Care/Early Education programs is also included.	
<b>ECE 102 Early Education</b>	<b>3</b>	<b>ECE 108 Emotional and Social Development</b>	<b>5</b>	<b>ECE 203 Observation and Assessment</b>	<b>4</b>
This course is an introduction to the developmental theories related to the nurturing and teaching of young children.		This course is an introduction to the factors that affect the healthy emotional and social development of children: the support of children's self-concept, effects of an individual's temperament on adult/child and child/child relationships, social/emotional milestones, and activities that support pro-social behavior.		The primary domains of development (physical, social, emotional, cognitive and creative) and how they are integrated for each child are emphasized. Students develop skills in observing and recording children's growth, development, and learning and use observations as tools for obtaining information about individual children and their needs.	
<b>ECE 103 STARS</b>	<b>2</b>	<b>ECE 109 Child Guidance</b>	<b>5</b>	<b>ECE 204 Early Childhood Lab III</b>	<b>2</b>
This course provides basic child care training for child care center teachers, program supervisors and directors. Its purpose is to provide entry-level employees with a basic core knowledge and motivation to see more early childhood education training.		This course is an introduction to the factors that affect the behavior of children with emphasis on positive guidance strategies. Topics include age-appropriate positive reinforcement, guidance, and discipline. The impact of family and cultural values on behavior and the effect of environment and activities on self-discipline is also included.		Students spend time in a child care/early education setting, practicing and developing teaching skills, planning/implementing/evaluating children's activities, and participating in curriculum planning with their on-site supervising teacher/director. Students schedule and participate in conferences with their on-site supervisor and program instructor to evaluate their skill development and training progress.	
<b>ECE 104 Learning Environments</b>	<b>5</b>	<b>ECE 110 Cognitive Development</b>	<b>5</b>	<b>ECE 205 Instructional Strategies</b>	<b>5</b>
This course is an introduction to the methods used to develop developmentally appropriate learning environments. Students identify, demonstrate, and evaluate criteria for planning learning environments for young children including the selection of equipment, materials, and supplies and the best use of physical space.		This course is an introduction to the theories of child development and the factors that influence children's cognitive development. Topics include the identification of milestones in the development of cognitive skills, recognition of the developmental sequence of communication skills, and the application of individual learning styles.		Methods of individual or group instruction and the role of the teacher/caregiver is emphasized. Students explore the theory of learning styles and their practical application in enhancing individual children's learning.	
<b>ECE 105 Early Childhood Lab I</b>	<b>2</b>	<b>ECE 111 Early Childhood Lab II</b>	<b>2</b>	<b>ECE 206 Curriculum Development</b>	<b>5</b>
Students spend time in a child care/early education setting, practicing and developing teaching skills, planning/implementing/evaluating children's activities, and participating in curriculum planning with their on-site supervising teacher/director. Students schedule and participate in conferences with their on-site supervisor and program instructor to evaluate their skill development and training progress.		Students spend time in a child care/early education setting, practicing and developing teaching skills, planning/implementing/evaluating children's activities, and participating in curriculum planning with their on-site supervising teacher/director. Students schedule and participate in conferences with their on-site supervisor and program instructor to evaluate their skill development and training progress.		The creation of developmentally appropriate curriculum for early childhood programs is emphasized. This course looks at contemporary philosophies and current best practices in curriculum activities, methods, and materials appropriate for planning a program for young children.	
<b>ECE 106 Growth, Development and Learning</b>	<b>4</b>	<b>ECE 201 Issues in Child Care / Early Education</b>	<b>5</b>	<b>ECE 207 Professionalism</b>	<b>5</b>
This course is an introduction to the many stages of child growth and learning including, the concept of sequential stages of development, factors influencing growth and learning, the definition and application of developmental appropriateness, and an introduction to methods of observing and recording children's development.		This course provides an opportunity to discuss the issues in child care that impact children and their world: ethical, legal, political, professional, diversity, and family/cultural values.		The application of the profession's code of ethics and advocacy for children and families is emphasized. Students also develop a professional portfolio and create a resource file of professional publications and organizations.	
				<b>ECE 208 Family Dynamics</b>	<b>5</b>
				Emphasis is on the understanding of family structures and techniques of supportive interactions with families. Parent involvement, education, conferences, and referrals are also included.	

	CREDITS
<b>ECE 209 Program Management</b>	<b>5</b>
This course emphasizes the principles and skills needed to manage childcare and/or various early education programs: licensing regulations; food programs; community resources; budgeting; record keeping; and staff selection, support, supervision, and training. Practical applications include the research and development of a project that focuses on an appropriate topic for presentation.	
<b>ECE 210 Early Childhood Lab IV</b>	<b>2</b>
Students spend time in a child care/early education setting, practicing and developing teaching skills, planning/implementing/evaluating children's activities, and participating in curriculum planning with their on-site supervising teacher/director. Students schedule and participate in conferences with their on-site supervisor and program instructor to evaluate their skill development and training progress.	
<b>ECE 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ECE 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ECE 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ECE 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ECE 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	

	CREDITS
<b>ECE 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>ECE 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

CREDITS

	CREDITS		CREDITS		CREDITS
<b>ELECTRICAL CONSTRUCTION</b>					
<b>ELCON 101 Introduction to Electrical Construction</b>	<b>3</b>	<b>ELCON 111 Systems Troubleshooting</b>	<b>3</b>	<b>ELCON 208 Industrial Installation</b>	<b>3</b>
This course is an introduction to the electrical construction field. OSHA, WISHA, and occupationally specific safety guidelines and standards are emphasized. Students also receive training in first aid and CPR and will receive a First Aid card upon completion.		Students will learn the art of troubleshooting electrical systems using the proper testing equipment and techniques in a safe manner.		Students are introduced to installation standards specific to industrial applications.	
<b>ELCON 102 Applied Physical Science</b>	<b>5</b>	<b>ELCON 112 Introduction to Blueprint Reading</b>	<b>3</b>	<b>ELCON 209 Industrial Hazards</b>	<b>3</b>
This course is an introduction to the physical sciences as they apply to the electrical field: electrical theory, Ohm's law, Watt's law, and the relation of current, resistance, and voltage.		This course introduces students to basic concepts of blueprint reading with emphasis on terminology, symbols, and lines commonly found on electrical schematics and plans.		This course introduces students to industrial specific safety hazards and techniques to avoid them.	
<b>ELCON 103 Hand and Power Tools</b>	<b>4</b>	<b>ELCON 113 Blueprint Reading Applications</b>	<b>5</b>	<b>ELCON 210 Motors and Controllers</b>	<b>4</b>
Students are introduced to tools, equipment, and processes common to the electrical industry. The safe operation and care of hand and power tools is emphasized.		A continuation of the concepts introduced in ELCON 202, students learn to interpret prints found in a set of construction drawings and understand their relationship to various electrical installations.		This course introduces the student to electrical motors and the various ways motors are started, stopped and controlled for electrical installations.	
<b>ELCON 104 Electrical Service Installation</b>	<b>4</b>	<b>ELCON 201 Specialty Tools</b>	<b>4</b>	<b>ELCON 211 Project Estimation</b>	<b>5</b>
Students learn to install basic service components. Students will install load centers, over current protection devices and terminate wires.		Students learn to operate common electrical field specialty tools including a variety of power tools, testing and measurement equipment, and commercial and industrial equipment.		Students learn the basics of jobsite estimation, including material estimation, labor and time management.	
<b>ELCON 105 Electrical Components</b>	<b>4</b>	<b>ELCON 202 Commercial Wiring</b>	<b>3</b>	<b>ELCON 212 Control Circuits</b>	<b>3</b>
Students will learn how to select the proper size load centers, conductor sizes for the load centers and select the proper size over current protective devices needed.		This course is a basic introduction to the field of commercial wiring.		Students learn how and why various ways motors can be controlled.	
<b>ELCON 106 Introduction to Residential Wiring</b>	<b>3</b>	<b>ELCON 203 Commercial Codes and Regulations</b>	<b>3</b>	<b>ELCON 213 Motor and Controllers Applications</b>	<b>3</b>
This part of the course is an introduction to the field of residential wiring methods, materials, and basic techniques needed for residential wiring.		Students learn the basic national and local electrical codes pertaining to commercial buildings.		Students learn techniques to build, wire and troubleshoot various motor controllers.	
<b>ELCON 107 National Electric Code</b>	<b>4</b>	<b>ELCON 204 Commercial Material Identification</b>	<b>3</b>	<b>ELCON 216 Transformers</b>	<b>3</b>
The National Electrical Code and its application to the safe installation of electrical conductors and equipment is presented.		Students are introduced to commercial specific construction materials.		This course offers students basic knowledge of electrical transformers, why they are needed, how to install them and basic working knowledge of electrical transformation.	
<b>ELCON 108 NFPA 70E Standard</b>	<b>4</b>	<b>ELCON 205 Commercial Installation</b>	<b>3</b>	<b>ELCON 215 Advanced Motor Controls</b>	<b>3</b>
This course offers a comprehensive study of NFPA 70E Standards and its safety application to the electrical field.		Students are introduced to installation standards specific to commercial buildings.		This course builds on concepts learned in ELCON 212 and ELCON 213. Students learn advanced techniques to motor control such as variable frequency drives and Programmable logic.	
<b>ELCON 109 Residential Design</b>	<b>3</b>	<b>ELCON 206 Industrial Wiring</b>	<b>3</b>	<b>ELCON 220 Advanced Projects I</b>	<b>10</b>
Practical application of National and regional electrical codes as they apply to residential buildings.		This course is a basic introduction to the field of industrial wiring.		Students participate in professional applications project.	
<b>ELCON 110 Residential Wiring Techniques</b>	<b>3</b>	<b>ELCON 207 Industrial Material Identification</b>	<b>3</b>	<b>ELCON 221 Advanced Projects II</b>	<b>10</b>
This is a continuation of ELCON 106 learned concepts. An advanced class on residential wiring techniques such as advanced planning, conductor sizing, special tool usage, the electrical bidding permitting process.		Students are introduced to industrial specific construction materials.		Students participate in professional applications project.	
				<b>ELCON 222 Advanced Projects III</b>	<b>10</b>
				Students participate in professional applications project.	
				<b>ELCON 223 Advanced Projects IV</b>	<b>10</b>
				Students participate in professional applications project.	
				<b>ELCON 291 Practical Applications</b>	<b>1-18</b>
				This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	

	CREDITS
<b>ELCON 292 Independent Projects</b>	<b>1-10</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ELCON 293 Independent Projects</b>	<b>1-10</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ELCON 294 Independent Projects</b>	<b>1-10</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ELCON 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>ELCON 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meets with the students to provide support and assistance during the experience.	
<b>ELCON 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

## ELECTRICAL ENGINEERING TECHNICIAN

	CREDITS
<b>ETRIC 111 Fundamentals of Drafting</b>	<b>2</b>
Students learn drafting terms and select and use drafting equipment, as well as lettering, line work, sheet layouts and scales.	
<b>ETRIC 112 Electrical Math Fundamentals</b>	<b>2</b>
Mathematics specific to engineering is introduced including Ohm's Law, electronic units and measurements, application of fractions, decimals, percentage, and whole numbers. Calculations with negative numberings, squares, square roots, and exponents are emphasize, as well as series, parallel, and combination circuit.	
<b>ETRIC 114 Fundamentals of Electricity</b>	<b>4</b>
This course provides an overview of atomic structure, electrical properties, and electrical theory. Parallel, series, and combination circuit are studied. Students are introduced to resistors, conductors, and problems are solved using Ohm's Law.	
<b>ETRIC 116 Applied Communications</b>	<b>2</b>
This course is an introduction to communication skills and their application to the electrical engineering field. Areas of emphasis include methods of improving communication, clarity, and graphic aids.	
<b>ETRIC 117 Electrical Math</b>	<b>3</b>
This course focuses on electronic formulas and solutions. Resistance of wires, types, and sizes are applied to voltage drop calculations, transformers, and meter movements.	
<b>ETRIC 118 Applied Electrical Math</b>	<b>4</b>
Application of math concepts to engineering problems in electrical circuits, power efficiency, wire sizing, and grounding is emphasized. Problems in inductance, capacitance, and impedance are solved. Transformers are studied and three-phase calculations are performed. Logic control concepts and solid state circuits are introduced.	
<b>ETRIC 123 Electrical Principles</b>	<b>4</b>
This course is an introduction to basic electronic principles including the vocabulary of electronics, processes, and principles. Magnetism, batteries, meters, and AC/DC principles are studied. Problems with conductors, insulators, and voltage drops are solve. Series, parallel, and combination circuits are explored.	
<b>ETRIC 124 Drafting Applications</b>	<b>3</b>
A continuation of the concepts introduced in ETRON 130, students apply such technical drafting practices as lettering, metric construction, technical sketching, orthographic projection, sections, and auxiliary views.	
<b>ETRIC 125 Engineering Drafting</b>	<b>3</b>
Students are introduced to the theory and application of dimensioning and tolerances, pictorial drawing, and preparation of construction drawings .	

	CREDITS
<b>ETRIC 129 Applied Electrical Principles</b>	<b>4</b>
Principles of inductance, capacitance, and impedance are studied. Students are introduced to transformers and power supplies. Solid state circuits, devices, and logic are studied.	
<b>ETRIC 134 Elements of Physics</b>	<b>2</b>
This course is an introduction to the mechanics and properties of matter including magnetism, electricity, fiber optics, atomic structure and nuclear energy as they relate to engineering. Sound and wave motion, light and optics are applied to design of lighting, low voltage signal systems, and power circuits.	
<b>ETRIC 135 Technical Communications</b>	<b>3</b>
Students learn written and oral communication techniques to express technical information in engineering. The development of writing skills necessary to plan and write technical formatted documents is emphasized. Students also develop resumes and cover letters.	
<b>ETRIC 136 Applied Physics</b>	<b>4</b>
Students learn properties of light, sound, temperature, and heat transfer as they relate to the electronics industry. Principles of light, refraction, reflection, and color are studied in their relationship to light sources and luminaires.	
<b>ETRIC 137 CAD Fundamentals</b>	<b>3</b>
This course is an introduction to the hardware, software, operation, and technical language of computer-aided drafting. Drawing setup, file management, and drawing aids are introduced as well as line and text commands.	
<b>ETRIC 140 Intermediate CAD</b>	<b>3</b>
A continuation of the concepts introduced in ETRIC 132, students use CAD systems to produce and edit drawings, Passwords, log on, and system security are introduced. Commands include text editing, drawing rotation, and mirror and cross hatching.	
<b>ETRIC 141 National Electrical Code</b>	<b>3</b>
The course is an introduction to the National Electric Code including terminology, definitions, format, and blueprint reading. Basic electrical code for various buildings classifications are covered. Wiring methods and materials, protective devices, selection, and sizing of conduit and conductors are also included.	
<b>ETRIC 142 Codes Applications I</b>	<b>3</b>
Requirements of overload and fault current protection are studied. Branch circuits and feeders for motors and general power loads are selected in accordance with codes. Grounding and bonding requirements are covered.	
<b>ETRIC 143 Fundamentals of Power Systems</b>	<b>3</b>
Students learn to draft one-line and riser diagrams. Emphasis is on the selection and application of wires, over current devices, raceways, and equipment.	



	CREDITS
<b>ETRIC 145 Technical Communications</b>	<b>3</b>
Students learn written and oral communication techniques to express technical information in engineering. The development of writing skills necessary to plan and write technical formatted documents is emphasized. Students also develop resumes and cover letters.	
<b>ETRIC 146 Physics for Engineers</b>	<b>2</b>
This course is an introduction to the mechanics and properties of matter including magnetism, electricity, fiber optics, atomic structure and nuclear energy as they relate to engineering. Sound and wave motion, light and optics are applied to design of lighting, low voltage signal systems, and power circuits.	
<b>ETRIC 171 Electrical Math</b>	<b>4</b>
This course focuses on electrical formulas and solutions. Resistance of wires, types, and sizes are applied to voltage drop calculations, transformers, and meter movements.	
<b>ETRIC 172 Electrical Math II</b>	<b>4</b>
Application of math concepts to engineering problems in electrical circuits, power efficiency, wire sizing, and related calculations are emphasized. Problems in inductance, capacitance, and impedance are solved. Transformers are studied and three-phase calculations are performed. Logic control concepts and solid state circuits are introduced.	
<b>ETRIC 204 Essentials of Electrical Systems Design</b>	<b>2</b>
This course is an introduction to the basic principles of electrical systems design including, project budgets, organization, and scheduling. Sheet layout and drawing order are determined. Preliminary lighting calculations are performed and preliminary electrical drawings are made.	
<b>ETRIC 205 Fundamentals of Lighting Systems</b>	<b>3</b>
Lighting design, color rendition, visual comfort, efficiency of sources, aesthetic appeal and photometric performance of fixtures are emphasized.	
<b>ETRIC 206 Fundamentals of Low-Voltage Systems</b>	<b>2</b>
Fire alarm, security, voice, and data components and layouts are reviewed.	
<b>ETRIC 207 Fundamentals of High-Voltage Systems</b>	<b>3</b>
Transmission and distribution voltage systems and equipment are introduced. Load calculations are performed for primary voltage systems.	

	CREDITS
<b>ETRIC 210 Advanced Power Systems</b>	<b>4</b>
Students learn system and equipment grounding and various types of raceways. Emphasis is on the selection and application of wires, over current devices, raceways, and equipment.	
<b>ETRIC 225 Advanced CAD Operations</b>	<b>3</b>
Students use CAD systems to produce engineering drawings using layers, masks, and groups. Symbols and x-reference are applied; drawings are printed and plotted.	
<b>ETRIC 227 Introduction to Commercial Electrical Systems</b>	<b>4</b>
Commercial project development, design team concepts, timelines, and sequence of design are emphasized. Students learn layout and circuiting of basic power devices. Luminaires are compared and selected.	
<b>ETRIC 228 Electrical System Design Applications</b>	<b>4</b>
Design projects and apply skills to draft, select, specify equipment, lighting calculations/design, service and power distribution calculations/design, and systems design and layout. Prepare construction cost estimates and bids.	
<b>ETRIC 230 Intermediate Electrical System Design</b>	<b>5</b>
The focus of this course is on three-phase loads: calculation and circuiting of heating equipment and motor loads. Students work in project design teams to select and draft lighting fixture and controls, power distribution equipment, and circuiting.	
<b>ETRIC 234 CAD Design Applications</b>	<b>4</b>
Students use CAD to draw electrical diagrams and schedules. Floor plans, power, and lighting plans are drawn and edited; notes and legends are added.	
<b>ETRIC 240 Commercial Electrical Design Applications</b>	<b>4</b>
Students assist project design teams to design and draft electrical systems and power distribution equipment. Lighting is selected, final calculations are made and circuited, and fixture and panel schedules are developed.	
<b>ETRIC 242 Fundamentals of Cost Estimating</b>	<b>2</b>
The course is an introduction to concepts and current cost estimating practices. Emphasis on elements of electrical construction, competitive bidding, and complete and accurate time and material take-offs. Various forms and formats are introduced.	

	CREDITS
<b>ETRIC 243 Construction Cost Estimating</b>	<b>3</b>
This course is an introduction to the estimate and preparation of the electrical project bids. Impact of specifications, substitutions, prime and sub-contractors are stressed. Labor factors and materials cost data base are introduced.	
<b>ETRIC 246 Advanced Electrical System Design</b>	<b>5</b>
Advanced students lead project design teams. The building service is designed and main panel selected. Circuits and panel loads are balanced, final load calculations are added as the drawings are completed. Dry-type transformers are introduced. Special design factors are incorporated for hazardous locations.	
<b>ETRIC 247 Codes Applications II</b>	<b>5</b>
THE NEC is studied in depth through student design projects. Code requirements are applied to the design of heating and motor circuits and feeders. Lighting and controls are specified in accordance with codes. Code compliant service entrance wires and equipment are selected. Codes for hazardous and specialized locations are interpreted and applied.	
<b>ETRIC 248 Construction Specifications</b>	<b>3</b>
This course is an introduction to the content, format, and basic principles of specification development and interpretation. Areas of emphasis include specifications as a legal and technical construction. Terms of design and construction, as well as the interrelationship of specifications in bidding are also included.	
<b>ETRIC 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ETRIC 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ETRIC 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	

## CREDITS

**ETRIC 294 Independent Projects 1-5**

This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ETRIC 296 Work-based Learning Experience 1-18**

Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**ETRIC 297 Work-based Learning Seminar 1-2**

Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**ETRIC 298 Work-based Learning –  
No Seminar 1-18**

This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## CREDITS

## CREDITS

## ELECTRONIC AND COMMUNICATIONS SYSTEMS TECHNOLOGY

ECS		CREDITS
ECS 201	<b>Telecommunications Network Cabling Systems</b>	5
	This course provides students with the skills necessary to take and pass industry certification exam for Network Cabling Specialist. Students train in termination, testing and troubleshooting copper based network to include twisted pair and coaxial cabling systems. Instruction includes lecture and lab on various pin, jack and termination block configurations. All construction and testing will conform to industry standards and specifications.	
ECS 202	<b>Fiber Optics</b>	5
	Applications of fiber optics, including telecommunications, CATV and computer networks, focusing on the technology, the components and their installation are covered in this course. Students utilize fiber specific equipment to learn and apply the fiber technology and perform fiber termination and testing.	
ECS 203	<b>FCC Licensure Prep I</b>	5
	Students prepare for Element 1 of the General Radiotelephone Operator License as issued through the Federal Communications Commission. Element 1 exam consists primarily of basic radio law and operating practices questions. Students who pass Element 1 will receive their Marine Radio Operators Permit.	
ECS 204	<b>FCC Licensure Prep II</b>	5
	Students prepare for Element 3 of the General Radiotelephone Operators License as issued through the Federal Communications Commission. This exam consists of radio, electronic circuits, signals and emissions questions. Students who pass Elements 1 and 3 will receive the GROL License. Students must have knowledge in electronics and electronic communications as a prerequisite to the class.	
ECS 205	<b>Wireless/RF Communications</b>	4
	This course provides overview of wireless applications, advantages and disadvantages of wireless systems. Introduction to Wireless data transmission techniques and standards overview. Simplified, but in-depth look at antennas and their role in successful implementation of a Wireless data communications system.	
ECS 206	<b>Wireless Personal Area Networks 2</b>	
	Personal, short distance area Wireless networks for interconnecting devices centered on a workspace or home is explored. WPANs address Wireless networking and mobile computing devices such as PC's, PDA's, peripherals, cell phones, pagers and consumer electronics. Short range Wireless data communications technologies including, infrared, Bluetooth, and ZigBee, RFid, WiMedia and Ultra wide band are introduced.	

ECS		CREDITS
ECS 207	<b>Wireless Local Area Networks</b>	3
	This course examines the fundamentals of various 802.11 Wireless standards including frequency bands, bandwidth, data rate, and applications. Topics include WLAN components such as NICs, access points, standards, operations and modulation technologies used to enable communication between devices in a limited area.	
ECS 208	<b>Wireless Broadband Networks</b>	4
	The fundamentals of medium and long range Wireless communications from infrared free-space optics to WiMax, cellular and satellite technologies are covered in this class. Additional technologies studied include local multipoint and multichannel multipoint distribution services used in high speed Internet access, multimedia file transfer, remote access to local area networks and telephone services.	
ECS 210	<b>Introduction to RF Communications</b>	2
	Students are introduced to wireless RF communications concepts such as radio wave propagation, wavelength, frequency, bandwidth, and signal analysis.	
ECS 211	<b>Amplitude Modulation</b>	3
	Amplitude modulation principles are introduced to RF communications systems. Studies focus on fundamentals of AM transmitters and receivers including measurements with oscilloscope and spectrum analyzer.	
ECS 212	<b>Single Sideband and Frequency Modulation</b>	4
	Single sideband and frequency modulation principles are introduced to RF communications systems. Studies include principles of modulation, demodulation, transmitters and receivers.	
ECS 213	<b>Transmission Lines and Antennas</b>	2
	No communications system is complete without a media to transmit information. Types of transmission lines discussed are twisted pair, coaxial, ladder line, and waveguides. Curriculum includes principles of electromagnetic propagation, antenna theory, RF radiation and safety.	
ECS 214	<b>Microwave, Telephony, and Cellular</b>	2
	This course focus is on microwave, radar communications systems, circuits and transmission methods. Students learn how land line telephone and cell phone systems work. Wireless telephony operations include AMPS, PCS, CDMA, GSM and TDMA.	

ECS		CREDITS
ECS 215	<b>Data and Networking Fundamentals</b>	2
	Studies include basics of data communications and networking fundamentals and topologies, networking hardware and media, LAN's, MAN's and WANs, the seven- layer OSI model and its application, Internet protocol (IP) and MAC addressing concepts, and additional protocols such as TCP, UDP, DHCP and ARP.	
ECS 216	<b>Advanced Communications Principles</b>	2
	Communications technologies change and advance to meet the desires of an information hungry society. Technologies such as global positioning systems (GPS), fiber optic and laser technology are just some of the methods used to deliver information such as data, video and more which are introduced in this course.	
ECS 230	<b>Telecommunications Fundamentals Lab</b>	2
	Students are introduced to telecommunication systems describing the circuits and components contained including telephone, cellular and satellite systems and processes. Students will utilize laptop computer, and a computer aided instruction online platform to complete training.	
ECS 231	<b>Radio Communications Lab</b>	3
	This lab class teaches the theory of operation, troubleshooting, and repair of standard AM/FM broadcast band receivers and AM/SSB/NBFM communications transceivers. Students will utilize laptop computer, computer aided instruction online platform, electronic experiment cards and industry recognized test equipment to complete training.	
ECS 232	<b>Microwave Lab Fundamentals</b>	2
	Students are introduced to microwave systems, waveguide theory, microwave devices and antennas. Students will utilize laptop computer, computer aided instruction online platform, electronic experiment cards, antennas, waveguide and reflectors, and industry recognized test equipment to complete training.	
ECS 233	<b>Signal Processing Lab</b>	4
	This lab class teaches the theory of operation, troubleshooting, and repair of various signal processing and modulation techniques to include time division multiplexing, pulse code modulation, frequency division multiplexing, frequency shift keying modulation and phase shift keying modulation. Students will utilize laptop computer, computer aided instruction online platform, electronic experiment cards and industry recognized test equipment to complete training.	

	CREDITS
<b>ECS 236 RF Communications Lab</b>	<b>5</b>
Students work with amplitude and frequency modulation transceivers, performing alignments, tests and measurements, with a focus on troubleshooting. Students learn about transceivers, while interfacing with communication equipment such as signal generators, frequency counters, oscilloscopes, and communication systems analyzers.	
<b>ECS 237 Telecommunications Lab</b>	<b>5</b>
This course includes a comprehensive computer interactive training system with complete coursework, supported by lab and experimentation. Lessons include advanced modulation and signal processing techniques such as pulse code modulation, frequency and phase shift keying, and multiplexing schemes such as time and frequency division multiplexing. Students train on microwave communication systems and set up wireless transmit/receive links. In addition, students acquire the skills needed to understand basic telephone, telecommunications and fiber optic systems.	
<b>ECS 249 Job Search and Preparation</b>	<b>3</b>
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.	
<b>ECS 290 Independent Study I</b>	<b>3-5</b>
This course offers students an opportunity to work independently on a subject/theme that is determined by both the instructor and the student. Subject matter should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ECS 291 Independent Study II</b>	<b>3-5</b>
This course offers students an opportunity to work independently on a subject/theme that is determined by both the instructor and the student. Subject matter should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ECS 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ECS 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	

	CREDITS
<b>ECS 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>ECS 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>ECS 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>ECS 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

## ELECTRONIC EQUIPMENT SERVICE TECHNOLOGY

	CREDITS
<b>EEST 101 Safety Principles</b>	<b>3</b>
This course is an introduction to safety practices required when working in the electronic equipment environment.	
<b>EEST 102 Applied Math</b>	<b>5</b>
This course is an introduction to mathematical theory and applications as they relate to the electronic circuits and the electronic equipment field.	
<b>EEST 103 Electronics Principles I</b>	<b>5</b>
This course is an introduction to the theory and fundamentals of basic DC electronic circuits.	
<b>EEST 104 DC Electronics</b>	<b>4</b>
This course is an introduction to the theory and fundamentals Ohm's law, series, and parallel circuits	
<b>EEST 105 AC Electronics</b>	<b>5</b>
This course is an introduction to the theory and fundamentals of the sine wave, wavelength, and the frequency of the AC circuit.	
<b>EEST 106 Inductors and Capacitors</b>	<b>4</b>
This course is an introduction to the theory and fundamentals of the reactance of the inductor and the capacitor in the AC circuit.	
<b>EEST 107 Electronics Principles II</b>	<b>5</b>
This course is an introduction to the theory and fundamentals of basic AC electronic circuits.	
<b>EEST 108 Amplifiers and Transistors</b>	<b>4</b>
This course is an introduction to the theory and fundamentals of basic amplifiers and transistors.	
<b>EEST 109 Electronic Devices</b>	<b>2</b>
This course is an introduction to the theory and fundamentals of basic electronic devices: such as diodes, transistors, SCR, triac, and FET.	
<b>EEST 110 Introduction to Programmable Logic Controllers</b>	<b>5</b>
This course is an introduction to the theory and fundamentals of programmable logic controllers with emphasis on applying and using ladder logic programming.	
<b>EEST 201 Electronic Principles - Automation</b>	<b>5</b>
This course is an introduction to the theory and fundamentals of basic Ladder logic programming.	

	CREDITS
<b>EEST 202 Antenna and Satellite Systems</b>	<b>3</b>
This course is an introduction to the theory and fundamentals of basic antenna and satellite systems.	
<b>EEST 203 Magnetic and Laser Media</b>	<b>3</b>
This course is an introduction to the theory and fundamentals of basic magnetic and laser median including magnetic tape players and CD players.	
<b>EEST 204 RF Receivers and Audio Amps</b>	<b>4</b>
This course is an introduction to the theory and fundamentals of basic RF receivers and audio amplifiers including synthetic and conventional receivers, audio amplifier circuits, conventional tube type, transistor, and FET circuits.	
<b>EEST 205 Video Projection</b>	<b>1</b>
This course is an introduction to the theory and fundamentals of basic video projection and Raster Scan.	
<b>EEST 206 Emerging Technologies</b>	<b>3</b>
Students learn about such current technologies as RFID, laser technology, IT applications in the medical field, security systems, and smart home technology. Course content may vary depending upon technological advances.	
<b>EEST 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>EEST 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>EEST 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	

	CREDITS
<b>EEST 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>EEST 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>EEST 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>EEST 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

## ELECTRONICS TECHNICIAN

<b>ETECH 101 Introduction to Electronics</b>	<b>2</b>
This course is an overview of electronics including terminology, general safety, and applied math principles specific to the industry.	
<b>ETECH 102 DC Circuits</b>	<b>5</b>
This course is an introduction to the theory and practical applications of DC circuits including resistors and resistive circuits, series and parallel circuits, meter movements, ammeters, voltmeters, VOMs, DMMs and Wheatstone Bridges.	
<b>ETECH 103 AC Circuits</b>	<b>5</b>
This course is an introduction to the theory and applications of AC circuits, capacitors, coils, transformers, oscilloscopes, signal generators, and component checkers. Prerequisite: ELECT 111, 112, 113 or department chair approval.	
<b>ETECH 104 Analog Circuits</b>	<b>5</b>
This course is an introduction to analog circuits. Topics include devices, diodes, transistors, power supplies, simple amplifiers, operational amplifiers, and thyristors. Voltage and current mode techniques are also introduced.	
<b>ETECH 105 Digital Circuits</b>	<b>5</b>
This course is an introduction to the basic concepts of numbering systems and digital devices such as gates, counters and flip-flops. Microprocessors, memory circuits, and microprocessor applications are also included.	
<b>ETECH 106 Microcontrollers</b>	<b>5</b>
The course is an introduction to the fundamentals of microcontroller-based systems, including applications, architecture, number systems, and languages.	
<b>ETECH 107 Employment Preparation</b>	<b>3</b>
This course is an introduction to communication concepts that emphasize resume writing and the development of job search skills.	
<b>ETECH 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	

## CREDITS

**FACILITIES MAINTENANCE ENGINEER****FACM 101 Safety Principles 2**

This course is an introduction to the safety practices and procedures as required by state and federal standards for building maintenance. Individual workplace and tool safety are emphasized.

**FACM 102 Fundamentals of Electricity 3**

This course is an introduction to the fundamentals of electricity and their application to the building maintenance industry: Ohm's law, basic circuitry fundamentals, electrical troubleshooting and the National Electrical Codes are studied.

**FACM 103 Electrical Service 4**

Students learn to troubleshoot, test, maintain, and repair electrical services within a building. Electric motors, controls, PLCs, and test equipment are studied.

**FACM 104 Introduction to Blueprint Reading 5**

Students learn to read, interpret, and create graphic drawings including building and machine blueprints, technical sketching, and working drawings. Trade math is also studied.

**FACM 105 Engineering Drawings 4**

A continuation of the concepts introduced in FACM 104, students learn to create commercial plans: plot, floor, elevation, sections, and plan details.

**FACM 106 Introduction to Hydraulics/Pneumatics 5**

This course is an introduction to basic fluid power, and the application of hydraulic principles to the building maintenance field. Hydraulic systems, circuits, and efficiency are studied.

**FACM 107 Machine Components 5**

This course is an introduction to industrial maintenance of machine components including predictive and preventive maintenance, lubrication requirements, vibration analysis, and close tolerance dimensioning.

**FACM 108 Mechanical and Machine Maintenance 5**

Students learn the processes used to maintain centrifugal, rotary, and reciprocating pumps, gears, and compressors, and other mechanical devices. Maintenance scheduling, computerized maintenance management systems, and computer-generated repair strategies are studied.

**FACM 109 Tools and Equipment 3**

This course is an introduction to the tools and equipment used in the building maintenance occupation. The safe use, maintenance, and storage of a variety of tools and equipment are emphasized. Stationary, hand, and power tools are used.

## CREDITS

**FACM 110 Introduction to Building Maintenance 3**

Students are introduced to the basic maintenance and repair methods used in the building maintenance profession.

**FACM 111 Building Maintenance and Repair Methods 5**

The maintenance, repair, and minor remodeling techniques to structures and the non-mechanical elements of a building complex are emphasized. Doors, windows, stairs, walls, siding, roofing and all other aspects of building maintenance are discussed.

**FACM 112 Basic Refrigeration 4**

This course is an introduction to basic refrigeration cycles and components. Mechanical compression systems, absorption systems and troubleshooting techniques are discussed.

**FACM 121 Grounds Keeping 5**

Students learn to select and use proper equipment for maintaining turf, shrubs, and plants. Irrigation system design, installation and repair, basic asphalt and concrete maintenance are studied.

**FACM 123 HVAC Systems 4**

This course is an introduction to the fundamentals of heating and air conditioning systems with emphasis on the adjustment of air flow, indoor air quality, troubleshooting of minor problems, and preventive maintenance methods are studied.

**FACM 140 Boiler Operations and Certification 12**

This course is an introduction to the basic principles of low and high-pressure steam boiler systems with emphasis on routine operation, maintenance, and emergency procedures. Upon successful completion of the coursework, students may test for certification as a Class V Boiler Operator/Fireman.

**FACM 142 Advanced Industry Application 10**

This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. Instructor permission is required before enrolling in this course.

**FACM 144 Advanced Boiler Operations 5**

Students learn advanced boiler methods of low and high-pressure steam boiler systems with emphasis on routine operation, maintenance, and emergency procedures. Upon successful completion of the coursework, students may test for certification as a Class IV Boiler Operator/Fireman.

## CREDITS

**FACM 220 Introduction to Remodeling 4**

Students learn light residential and commercial design and remodeling methods including the bidding process. Energy auditing, building code requirements, retrofit, and updating the built environment are researched.

**FACM 221 Small Business Planning 3**

Students learn light residential and commercial design and remodeling methods including the bidding process. Energy auditing, building code requirements, deconstruction, sustainable retrofit and updates to the building environment are researched.

**FACM 230 Computers in Industry 2**

Students are introduced to the use of computers in maintenance management with the use of basic computer programs.

**FACM 231 Computer Applications 4**

Students learnt to create preventive maintenance schedules using a spreadsheet application with mainstream applications utilized by maintenance technicians. Students use common programs for research, cost analysis, scheduling, tracking and reporting. They also learn to use common computer applications to communicate, build, and share maintenance-related coursework.

**FACM 291 Practical Applications 1-18**

This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work, be industry / program related, and should result in the achievement of advanced learning in the subject area chosen. Instructor permission is required before enrolling in this course. This coursework should directly apply concepts learned in a particular training area.

**FACM 292 Independent Projects 1-5**

This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work, be industry / program related, and should result in the achievement of advanced learning in the subject area chosen. Instructor permission is required before enrolling in this course.

**FACM 293 Independent Projects 1-5**

This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work, be industry / program related and should result in the achievement of advanced learning in the subject area chosen. Instructor permission is required before enrolling in this course.

	CREDITS
<b>FACM 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work, be industry / program related and should result in the achievement of advanced learning in the subject area chosen. Instructor permission is required before enrolling in this course.	
<b>FACM 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are training. They apply the skills they have learned in the classroom, lab, and coursework to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider. Instructor permission is required before enrolling in this course.	
<b>FACM 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance before and during the WBL experience. Instructor permission is required before enrolling in this course.	
<b>FACM 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area. Instructor permission is required before enrolling in this course.	

## FIRE PROTECTION ENGINEERING TECHNOLOGY

	CREDITS
<b>FPET 101 Introduction to Fire Protection Engineering</b>	<b>3</b>
This course is an introduction to the fire protection engineering industry and its role in the protection of building. Policies and requirements of the Bates' program is also presented.	
<b>FPET 102 Building Construction</b>	<b>5</b>
This course is an introduction to the building design principles and how the application of fire protection systems and methods are used to protect individual buildings. Students learn the various parts of buildings and how those are graphically depicted and verbally described on construction documents.	
<b>FPET 103 Research Methods</b>	<b>5</b>
Students explore various methods of accessing pertinent information relative to fire protection engineering technology including general and special library collections, Internet resources, and governmental holdings.	
<b>FPET 104 History of Fire Protection</b>	<b>1</b>
This course presents a brief history of fire protection, early attempts at regulating behaviors, and using technological solutions to the fire problem, from ancient time to present day practices.	
<b>FPET 105 Occupational Safety</b>	<b>1</b>
This course is an introduction to the hazards of personal safety associated with the fire protection industry.	
<b>FPET 106 Applied Math and Science</b>	<b>4</b>
This course is an introduction to math and science and their application to the fire protection engineering technology industry including basic mechanics, applied plane and solid geometry, basic principles of college level physics, and the concepts of statics and dynamics.	
<b>FPET 107 Alarm and Suppression System Design I</b>	<b>5</b>
This course is an introduction to the design of fire alarm and suppression systems.	
<b>FPET 108 Design Seminar</b>	<b>2</b>
This course provides students with the opportunity to explore in depth some of the specific principles of design introduced in FPET 107 and 112.	
<b>FPET 109 Drafting Fundamentals I</b>	<b>4</b>
Students learn to use basic computer-aided drafting (CAD) from the setup of the workspace to the printing of the finished product.	

	CREDITS
<b>FPET 110 Codes and Standards</b>	<b>5</b>
Students learn what codes and standards are applicable to buildings with emphasis on particular model codes and standards adopted as the building and fire codes of Washington State applicable to fire protection, including those developed by the International Codes Council (ICC) and the National Fire Protection Association (NFPA).	
<b>FPET 111 The Practice of Fire Protection</b>	<b>5</b>
This course introduces students to certain business concepts such as contracts and certifications, and additionally includes job hunt and career advancement strategies.	
<b>FPET 112 Sprinkler Design I</b>	<b>5</b>
Student learn the fundamentals of hydraulics, basic sprinkler system layout, and the principles of mathematically designing and calculating these systems	
<b>FPET 113 Drafting Fundamentals II</b>	<b>3</b>
A continuation of the concepts introduced in FPET 109, students practice more intermediate aspects of computer-aided drafting (CAD). Prerequisite: FPET 109.	
<b>FPET 114 Introduction to Inspection and Testing</b>	<b>3</b>
Students are introduced to the concept of the inspection and testing of emergency, stand-by fire protection equipment and why regularly scheduled inspections and tests are critical.	
<b>FPET 115 Calculation Seminar</b>	<b>2</b>
This course is a continuation of the mathematical calculations for design as introduced in FPET 107 and 112.	
<b>FPET 116 Drafting Fundamentals III</b>	<b>3</b>
Students are introduced to universal drafting fundamentals that are applicable to both hand drafting and CAD and their application to architectural drawings: scaling, title blocks, legends, schedules, and line weights, etc. Sketching and the concept of the engineer's notebook are also explored. Prerequisite: FPET 113	
<b>FPET 117 Fire Protection Project/ Applications</b>	<b>3</b>
Students are given the opportunity to explore any fire protection application of interest to the individual student. The instructor and the student will negotiate the parameters of the independent project.	

	CREDITS
<b>FPET 200 Advanced Codes</b>	<b>3</b>
This course provides a forum where advanced students can explore aspects of codes and standards in a small group, informal discussion format. The topics of discussion are chosen by the students, either from instructor suggestions or from their own interests.	
<b>FPET 201 Projects I</b>	<b>4</b>
Course emphasis is on single-family residences. Students design sprinkler and smoke alarm systems in two single-family dwellings, duplexes, or townhouses to include street connections and a partial submittal package. Students specializing in sprinkler design are particularly encouraged to complete the entire four projects courses series and FPET 205.	
<b>FPET 202 Projects II</b>	<b>4</b>
A continuation of the FPET 201, course emphasis is on other than single-family residential occupancies. Students design sprinkler and fire alarm systems for a multi-family dwelling and another residential occupancy such as a small hotel or dormitory building to include street connections and a partial submittal package.	
<b>FPET 203 Projects III</b>	<b>4</b>
A continuation of FPET 201 and 202, course emphasis is on commercial and industrial occupancies. Students design sprinkler and fire alarm systems for two small commercial or industrial occupancies such as a restaurant, warehouse, and strip malls to include street connections and a full submittal package.	
<b>FPET 204 Projects IV</b>	<b>4</b>
A continuation of FPET 201, 202, and 203, students design a sprinkler, a standpipe, and a fire alarm system for a mixed-use occupancy. The mixed use includes a parking garage, a mercantile floor, at least one level of business occupancy, and at least two residential floors.	
<b>FPET 205 Practical Applications I - Design</b>	<b>4</b>
Students explore individual design topics in depth with topics relating to special considerations of overall design.	
<b>FPET 206 Practical Applications II – Commissioning and Inspections</b>	<b>3</b>
Students explore specific topics relating to commissioning and inspections individual design topics in depth with topics relating to special considerations of overall design. Typical topics may include NFPA 3 and the process of building commissioning or the limits and responsibilities of the inspector under an NFPA 25 contract.	

	CREDITS
<b>FPET 207 Practical Applications III – Water Supplies</b>	<b>4</b>
In this small group seminar style course students will take a detailed look at water supplies. Students will present an oral or written report/presentation on their conclusions. Topics and conclusions may be addressed individually or by students in groups.	
<b>FPET 208 Practical Applications IV – Risk Management</b>	<b>3</b>
In this small group seminar style course students will explore general topics of risk management. Typical topics might include cost/benefit analysis, approaches to risk, cost and diminishing returns, the role of actuaries, etc. Students will participate in determining the topic(s) to be explored and will present an oral or written report/presentation on their conclusions. Topics and conclusions may be addressed individually or by students in groups.	
<b>FPET 210 Notification Integration</b>	<b>1</b>
Fire suppression, fire resistance (compartmentalization), and fire detection and notification is all important in an overall fire protection strategy. This course will focus on the integration of those systems and how they work together to provide a full strategy of property protection and life safety.	
<b>FPET 211 Applied Chemistry and Physics</b>	<b>2</b>
This course is an introduction to fundamentals of chemistry and physics as they apply to the fire protection industry.	
<b>FPET 212 Sprinkler Equipment and Systems</b>	<b>3</b>
Students explore in detail the actual equipment and systems used in basic fire protection: wet and dry sprinkler risers and systems; fire pumps; basic alarms utilizing smoke and heat detectors for initiation; and horns and strobes for notification.	
<b>FPET 214 Special Systems and Equipment</b>	<b>3</b>
This course investigate the more specialized actual systems and equipment applications found in water-based fire control and suppression such as pre-action and deluge systems, special application sprinklers, and the various types of standpipes.	
<b>FPET 216 Special Hazards Systems</b>	<b>4</b>
This course covers other suppression systems and strategies that are neither sprinklers nor water-based.	
<b>FPET 217 Notification Appliance and Monitoring Applications</b>	<b>2</b>
This course explores the equipment and methodologies used to notify and evacuate when danger is present.	

	CREDITS
<b>FPET 218 Detection Systems</b>	<b>3</b>
This course explores the equipment and methodologies used to detect and determine that a danger exists.	
<b>FPET 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>FPET 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>FPET 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>FPET 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>FPET 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>FPET 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>FPET 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	



	CREDITS		CREDITS		CREDITS
<b>FIRE SERVICE</b>		<b>FIRES 111 Fire Service Applications III</b>	<b>4</b>	<b>FIRES 204 Physical Fitness V</b>	<b>1</b>
<b>FIRES 101 Orientation to Fire Service</b>	<b>2</b>	Students apply the theory presented in lecture/lab and demonstrate performance standards.		Throughout their training, students acquire the physical strength and stamina required of the profession. Each physical fitness course builds upon the levels previously achieved by the student	
This course is an introduction to the history, evolution, organization, and traditions of the fire service.		<b>FIRES 112 Physical Fitness III</b>	<b>1</b>	<b>FIRES 205 Hazardous Materials</b>	<b>3</b>
<b>FIRES 102 Firefighter Safety</b>	<b>4</b>	Throughout their training, students acquire the physical strength and stamina required of the profession. Each physical fitness course builds upon the levels previously achieved by the student.		This course emphasizes the knowledge required to operate at NFPA 472 entry-level standards for the first responders to hazardous materials incidents. Student also learn operations techniques as described in national standards for responders to hazardous materials incidents.	
This course provides a foundation of knowledge regarding the significant risks associated with the fire service and a look at the common causes of injuries and death faced by today's firefighter.		<b>FIRES 121 Wildland Firefighter</b>	<b>2</b>	<b>FIRES 206 Employment Preparation</b>	<b>2</b>
<b>FIRES 103 Fire Service Applications I</b>	<b>5</b>	This course introduces students to wild land fire behavior, tactics, the 10 standard fire-fighting orders, and the 18 "watch out" situations found in wild-land situations. The course includes elements of S-130 and S-190, and includes an arduous Pack Test and fire shelter deployment which leads to wild-land Red-Card certification.		Students are introduced to emergency service professionals' career ladder structures. They also learn a variety of job search skills necessary to gain employment in the fire service.	
Students apply the theory presented in lecture/lab and demonstrate performance standards.		<b>FIRES 122 Fire Vehicle Operations</b>	<b>4</b>	<b>FIRES 207 Strategy, Tactics, and Incident Management</b>	<b>2</b>
<b>FIRES 104 Physical Fitness I</b>	<b>1</b>	This course provides the skills required by the Washington State Fire Protection Policy Board pertaining to the safe operation of emergency vehicles. The proper operation/maintenance of fire pumps, the roles and responsibilities of the driver/operator, and the theory and principles behind water flow and calculations are included.		Students are introduced to the National Fire Protection Association Incident Management System at the intermediate level (NIMS). Fire Ground Tactics and Strategies is also included.	
Throughout their training, students acquire the physical strength and stamina required of the profession. Each physical fitness course builds upon the levels previously achieved by the student.		<b>FIRES 123 Fire Service Applications IV</b>	<b>5</b>	<b>FIRES 208 Fire Service Applications VI</b>	<b>4</b>
<b>FIRES 105 Introduction to Fire Science</b>	<b>3</b>	Students apply the theory presented in lecture/lab and demonstrate performance standards.		Students apply the theory presented in lecture/lab and demonstrate performance standards.	
This course introduces students to the science of fire: the exothermic oxidation of a combustible substance. Additional topics include fire behavior and suppression methods and how ventilation affects the growth of fire.		<b>FIRES 124 Physical Fitness IV</b>	<b>1</b>	<b>FIRES 209 Healthcare Provider</b>	<b>1</b>
<b>FIRES 106 Fire Hose and Appliances</b>	<b>3</b>	Throughout their training, students acquire the physical strength and stamina required of the profession. Each physical fitness course builds upon the levels previously achieved by the student.		The course is designed to provide a wide variety of healthcare professionals the ability to recognize several life-threatening emergencies, provide CPR, use an AED, and relieve choking in a safe, timely, and effective manner. The course is intended for certified or noncertified, licensed or non licensed healthcare professionals.	
This course introduces students to the care, maintenance, and use of fire hose, hose tools, and associated appliances. Students also learn to identify key components of municipal and rural water supply systems.		<b>FIRES 201 Rescue Procedures</b>	<b>3</b>	<b>FIRES 210 Confined Space Rescue</b>	<b>1</b>
<b>FIRES 107 Fire Service Applications II</b>	<b>5</b>	Students learn the techniques used to rescue civilians and fire service personnel in various rescue situations: vehicle extrication, trench rescue, confined space rescues, and high-angle rescues.		Students are introduced to confined space rescue standards as determined by the National Fire Protection Association (awareness level).	
Students apply the theory presented in lecture/lab and demonstrate performance standards.		<b>FIRES 202 Advanced Fire Service</b>	<b>3</b>	<b>FIRES 211 Advanced Firefighter</b>	<b>3</b>
<b>FIRES 108 Physical Fitness II</b>	<b>1</b>	This course emphasizes the dangers of building construction to the firefighter and ways to prevent injury and death including the use of protective systems, detection systems, and suppression systems and proper understanding of these systems, how they operate, and how to use them correctly.		Students are introduced to the minimum requirements established by the National Fire Protection Association for Firefighter II certification. Topics to be presented include IMS, foam ops, and auto extrication.	
Throughout their training, students acquire the physical strength and stamina required of the profession. Each physical fitness course builds upon the levels previously achieved by the student.		<b>FIRES 203 Fire Service Applications V</b>	<b>5</b>	<b>FIRES 220 Fire Service Applications VII</b>	<b>4</b>
<b>FIRES 109 Ladders</b>	<b>5</b>	Students apply the theory presented in lecture/lab and demonstrate performance standards.		Students apply the theory presented in lecture/lab and demonstrate performance standards.	
This course covers the various types of portable and mounted ladders used in the fire service. Students learn the uses of ladders on the fire scene, various methods for placement, and maintenance of ladders while suppression operations are in progress.					
<b>FIRES 110 Intermediate Fire Service</b>	<b>2</b>				
During this course, students learn about the different types of extinguishers available for extinguishment of different classes of fires. The operation of the tools and equipment necessary to perform salvage and overhaul operations successfully on the fire ground is also presented. Additionally, students are exposed to basic fundamentals of fire investigations.					

	CREDITS
<b>FIRES 221 Experiential Lab/Drill</b>	<b>4</b>
During this advanced phase of training, students are assigned to, and drill with, organized emergency services organizations. This may include a variety of organized units such as fire engine companies, hazardous-mat operations companies, crash/slash/fire rescue companies, an advanced life support company, or a confined space rescue company.	
<b>FIRES 225 Emergency Medical Technician (EMT)</b>	<b>8</b>
This course prepares students to meet the requirements for employment as an EMT-B. It adheres to the U.S. Department of Transportation guidelines and the Washington State Department of Social and Health Services standards.	
<b>FIRES 240 Fire Instructor</b>	<b>3</b>
This course is an introduction to a fire instructor's duties as written by the requirements of the National Fire Protection Agency (NFPA) 1041, Standard for Fire Service Instructor Qualifications. Students examine a basic study of elements that influence teaching and learning. Special attention is given to the Fire Service Training Instructor's relationship to student safety as well as the legal liabilities involved. Instruction will include discussion of techniques for preparing effective lessons using the psychology of learning. Other topics include: training aids, copyright law, learning theories, purposes and principles of testing and evaluation.	
<b>FIRES 241 Fire Safety Office</b>	<b>2</b>
This course is an introduction to the duties as written by the requirements of the National Fire Protection Administration (NFPA) 1521, Standard for Fire Department Safety Officer, 2002 Edition. Course elements are designed to identify and analyze health and safety aspects relating to their role as Incident Safety Officer in both emergency and non-emergency situations.	
<b>FIRES 242 Fire Officer I</b>	<b>5</b>
This course is an introduction to a fire officer's duties as written by the requirements of the National Fire Protection Agency (NFPA) 1021, Standard for Fire Officer Professional Qualifications. Content includes leadership, supervisory and decision making practices, legal responsibilities, communication practices, report writing, workplace safety, quality assurance and pre-incident planning.	
<b>FIRES 243 Fire Service II</b>	<b>5</b>
This course is the second level of standards-based certification available to firefighters. Course materials provide additional information on topics included in the Firefighter I program, and allows the firefighter to participate in certification testing to obtain Firefighter II certification based on NFPA 1001, 2008 edition.	

	CREDITS
<b>FIRES 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>FIRES 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>FIRES 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>FIRES 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>FIRES 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>FIRES 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>FIRES 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

CREDITS

	CREDITS		CREDITS		CREDITS
<b>HEARING INSTRUMENT TECHNOLOGY</b>					
<b>HEAR 110 Introduction to Hearing Professions</b>	5	<b>HEAR 132 Audiometric Interpretation I</b>	5	<b>HEAR 223 Clinical II</b>	3
This course focuses on the role of professionals dealing with hearing healthcare and the role of the hearing aid specialist within the healthcare model. Students investigate the different work settings and delivery models that are available in their desired work community.		Students practice how to read, record, and explain results of audiometric testing in both professional and lay language. The emphasis is on degree, nature and configuration of hearing thresholds as they appear on the audiogram. The Initial process of patient specific recommendations to solve communication difficulties are introduced in this course.		All testing performed In Clinical I are continued with the addition of speech audiometry, tympanometry, and impressions.	
<b>HEAR 111 Safety Practices</b>	4	<b>HEAR 210 Hearing Assessment III</b>	3	<b>HEAR 230 Hearing Aid Service and Repair</b>	5
This course introduces universal and personal safety hygiene in the hearing clinic as well as state required 4 hours of AIDS/HIV training and blood borne pathogens.		A continuation of the concepts introduced in Hearing Assessment II, this course is a comprehensive analysis of the decision making process used to choose appropriate test protocols.		This course concentrates on the maintenance of a functioning hearing aid as well as troubleshooting a non-functioning or distorted hearing aid. Minor office repairs are demonstrated and practiced both in the classroom setting and in the clinical setting.	
<b>HEAR 112 Acoustics</b>	5	<b>HEAR 211 Aural Rehabilitation I</b>	3	<b>HEAR 231 Aural Rehabilitation II</b>	4
Students learn the basics of sound production and sound amplification as it applies to human hearing and the manipulation of sound to improve hearing.		This course introduces the concepts of hearing impairment, hearing handicap, and hearing disability. Individual variables such as co-existing medical conditions, psychological adjustment, cultural values, socio-economic status, and disability are presented.		This class focuses on different verification strategies and counseling tools for the hearing aid user. Topics such as current trends, Deaf Culture, cochlear implants, and assistive listening devices are investigated.	
<b>HEAR 113 Hearing Assessment I</b>	3	<b>HEAR 212 Business Aspects I</b>	5	<b>HEAR 232 Business Aspects II</b>	4
Students identify key components of patient centered case history and practice in the classroom setting. Basics of otoscopy and standard pure tone testing are demonstrated and practiced in the classroom setting.		This course introduces the different methods of hearing aid distribution, from the holding companies, vendors, retail and private dispensing offices. Students will be exposed to different sales philosophies and the ever changing industry.		Current industry trends are identified and discussed in this course. The student has the opportunity to create a business plan or produce a professional resume. Washington state laws, federal laws and ethics will be a topic for discussion.	
<b>HEAR 120 Anatomy and Physiology</b>	5	<b>HEAR 213 Clinical I</b>	3	<b>HEAR 233 Clinical III</b>	4
Normal anatomy and physiology of the human ear and related structures are discussed as it pertains to hearing.		In this course the student will shadow professionals in the field, in the Bates Hearing Clinic, and will begin to interact with patients under direct supervision of the instructor. Activities will depend upon the patient and student needs.		Clinical III is a continuation of Clinical II. All skills are applied in a full service hearing aid clinic with direct or indirect supervision.	
<b>HEAR 121 Instrumentation</b>	5	<b>HEAR 220 Hearing Aid Evaluation</b>	5	<b>HEAR 291 Practical Applications</b>	1-18
This course is designed to introduce the student to the different equipment that is used in the industry and state requirements for maintenance and calibration.		In this course the student will practice all test procedures needed to recommend, select and dispense a hearing aid. At minimum variables such as patient communication style, hearing loss, degree of perceived handicap, motivation and patient expectations will be considered.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>HEAR 122 Hearing Assessment II</b>	3	<b>HEAR 221 Audiometric Interpretation II</b>	5	<b>HEAR 292 Independent Projects</b>	1-5
Continuation of Hearing Assessment I, the student practices obtaining case histories, performs otoscopy and standard pure tone audiometry in the classroom setting. Speech audiometry and special testing are introduced.		In this course the student will begin to analyze consistency of test results for validity. A variety of counseling and assessment tools to educate and the potential hearing aid patient/family/friends will be introduced and practiced in the lab.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>HEAR 130 Disorders of the Auditory System</b>	5	<b>HEAR 222 Hearing Aids II</b>	5	<b>HEAR 293 Independent Projects</b>	1-5
Common medical pathologies that affect the ear and hearing are described and discussed with emphasis on otologic conditions and audiometric test results that require medical referral by state and federal law.		A continuation of Hearing Aids I, this course focuses on the electro-acoustic testing of hearing aids, basic programming of hearing aids along with validation and verification techniques to ensure optimal hearing aid fit for patient.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>HEAR 131 Hearing Aids I</b>	5				
The history of hearing aids and the development of technology and hearing aid components are discussed. Students learn how different hearing aid technologies can affect patient outcomes. Techniques for making impressions for custom ear molds and hearing aid shells are introduced and practiced in the classroom.					

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<b>HEAR 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>HEAR 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>HEAR 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>HEAR 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

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<b>HEATING, VENTILATION, AIR CONDITIONING, REFRIGERATION TECHNICIAN</b>					
<b>HVAC 101 HVAC/R Fundamentals</b>	<b>3</b>	<b>HVAC 110 Residential HVAC/R Systems</b>	<b>5</b>	<b>HVAC 209 Air Balance and Duct Sizing</b>	<b>2</b>
This course is an introduction to the HVAC industry. It will introduce the student to HVAC history, environmental heating and cooling, food preservation, industry opportunities, professional organizations, useful publications, available certifications and what is required of an employee.		This course is an introduction to unitary systems, split systems, and the arrangement, placement, and matching of equipment. Students learn to troubleshoot residential cooling and heating equipment.		This course is an introduction to the techniques and procedures used in the residential construction industry to determine proper sizing of HVAC equipment and ducts to meet the requirements for a high-quality, comfortable climate in terms of heating, cooling, humidifying, dehumidifying, ventilation and air cleaning or filtering.	
<b>HVAC 102 Safety</b>	<b>2</b>	<b>HVAC 111 Light Commercial HVAC Systems</b>	<b>5</b>	<b>HVAC 210 Drafting/Blueprint Reading</b>	<b>4</b>
OSHA and WISHA procedures and regulations are presented. Students complete the Washington State Industrial First Aid / CPR program. The use of personal protection equipment, and safe work practices.		A continuation of the concepts introduced in HVAC 110, students learn about unitary and split air conditioning and heating equipment used in light commercial applications. Oil heating equipment is also presented.		Students learn basics of preparing plans and orthographic and isometric drawings used to create building blueprints. The identification and application of plumbing, electrical, air conditioning, and refrigeration symbols found on mechanical drawings is emphasized.	
<b>HVAC 103 HVAC/R Science</b>	<b>2</b>	<b>HVAC 112 Heat Pump Systems</b>	<b>4</b>	<b>HVAC 211 Commercial Environmental Systems</b>	<b>5</b>
This course will cover the importance of the properties of matter, laws of conservation of energy, common forms of energy, energy conversion and electrical distribution. Temperature measurement and conversion, thermodynamics, pressures and vacuums.		A continuation of the concepts introduced in HVAC 110 and HVAC 111. This course is an introduction electric heating equipment, heat pump components, applications and troubleshooting.		This course provide the students with the knowledge commercial air conditioning systems, air handlers, accessories, package units, and controls	
<b>HVAC 104 HVAC/R Tools and Equipment</b>	<b>4</b>	<b>HVAC 201 HVAC/R System Design, Sizing, and Layout</b>	<b>4</b>	<b>HVAC 212 Chilled Water Systems</b>	<b>2</b>
Students learn the proper use of hand tools, fasteners, electrical, refrigeration and heating test instrument and servicing equipment.		Students are introduced to basic building construction, fans, airflow, duct design, installation, zone controls, test and balancing air systems, psychrometrics, indoor air quality, filters, humidifiers, and residential load calculations.		This course is an introduction to types of chilled water units, purge recovery, compressor arrangement, chiller economizers, oil return systems, and absorption chiller operation.	
<b>HVAC 105 Refrigerant and Refrigeration Systems Sections A</b>	<b>4</b>	<b>HVAC 202 Welding Processes (SMAW/GMAW)</b>	<b>2</b>	<b>HVAC 213 Hydronic Heating Systems</b>	<b>2</b>
Students learn refrigeration system components and operation, refrigeration cycle, compressors, condenser, metering devices and evaporators.		This course is an introduction to basic oxyacetylene welding including flat and vertical bead on plate. A general overview of terminology and general safety is also include.		Students learn the uses of common terminal units, types of piping, configuration of multiple systems, motorized controls valves, radiant heating, mixing valves, and the circulators used.	
<b>HVAC 106 Refrigerant and Refrigeration Systems Sections B</b>	<b>3</b>	<b>HVAC 203 Hand Held Torch</b>	<b>2</b>	<b>HVAC 214 Cooling Towers Basics</b>	<b>1</b>
A continuation of the concepts introduced in HVAC 105, students learn refrigerant properties, system piping, accessing sealed systems, refrigerant management, system evacuation and charging.		Basic oxyacetylene cutting and burning is presented.		Students learn the basics types of cooling towers and cooling tower operation and maintenance.	
<b>HVAC 107 HVAC/R Electrical Systems and Components</b>	<b>5</b>	<b>HVAC 204 SMAW (ARC) Applications</b>	<b>2</b>	<b>HVAC 215 Introduction to Thermal Storage</b>	<b>2</b>
Students learn basic electricity, power, circuits, electric motors, electrical components, diagrams and controls.		Basic arc welding in the horizontal, vertical, and overhead positions is presented.		Students are introduced to the theory of thermal storage including mode of operation.	
<b>HVAC 108 Soldering and Brazing Applications</b>	<b>3</b>	<b>HVAC 205 GMAW (MIG) Applications</b>	<b>2</b>	<b>HVAC 216 EPA Section 608 Exam</b>	<b>1</b>
Students learn techniques of heat bonding copper tubing and dissimilar materials using soft solder and brazing alloys common to the HVAC industry.		Basic steel and aluminum MIG welding in the horizontal, vertical and overhead positions are presented.		This course is a precursor to taking the EPA Section 608 exam. Employee must be certified by the EPA to handle refrigerant under penalty of law. Three types of exams are available: Type I, Type II, and Type III. All three types require that a core exam also be passed. The minimum requirement for HVAC/R technicians is a Type II.	
<b>HVAC 109 Basic HVAC/R Math Applications</b>	<b>3</b>	<b>HVAC 206 Basic Metalworking</b>	<b>2</b>	<b>HVAC 217 Commercial Refrigeration</b>	<b>3</b>
This course is an introduction to the basic mathematic calculation used in the HVAC/R industry.		Students learn to identify the components, equipment, and operation for sheet metal layout and fabrication.		Students learn to identify high temperature, medium temperature and low temperature refrigeration systems, food preservation, various type of systems used, and basic principles of operation.	
		<b>HVAC 207 Basic Layout and Patterns</b>	<b>2</b>		
		A continuation of the concepts introduced in HVAC 213, students fabricate patterns and join them in a line of fittings.			
		<b>HVAC 208 Fabrication Practices</b>	<b>2</b>		
		Students learn the procedures used in the installation of a complete residential central heating, ventilation, and air conditioners.			

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<b>HVAC 218 Installation, Maintenance, and Troubleshooting</b>	<b>2</b>
This course is an introduction to installation standards, equipment placement, piping procedures, determining the correct charge, planned maintenance, and troubleshooting procedures.	
<b>HVAC 219 AHRI Industry Competency Exam #1 (ICE)</b>	<b>2</b>
This course is a precursor to taking industry recognized national AHRI Industry Competency Exam (ICE Exam). The three test areas include: Residential Heating and AC, Light Commercial Heating and AC, and Commercial Refrigeration. Completion of one exam of the three exams is required for Support Technician credential and AT Degree.	
<b>HVAC 220 AHRI Industry Competency Exam #2 (ICE)</b>	<b>2</b>
This course is a precursor to taking industry recognized national AHRI Industry Competency Exam (ICE Exam). The three test areas include: Residential Heating and AC, Light Commercial Heating and AC, and Commercial Refrigeration. Completion of an additional exam is required for AT Degree.	
<b>HVAC 221 HVAC/R Industry Math</b>	<b>5</b>
This course is an introduction to the math calculations common to the industry, including algebraic formulas; calculation of angles, areas, and volumes of various geometric shapes; and system load calculations.	
<b>HVAC 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>HVAC 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>HVAC 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	

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<b>HVAC 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>HVAC 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>HVAC 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>HVAC 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

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## INDUSTRIAL ELECTRONICS AND ROBOTICS TECHNICIAN

**IERT 101 Introductory Industrial Robotics 5**  
This course provides an overview of industrial robots, their role in process automation, programming methods, and the technologies robots depend on to perform their functions. Other key elements of this course are end-of-arm tooling, electromechanical systems, fluid power systems, system interfacing, robot vision, and preventative maintenance.

**IERT 102 Applied Geometry 5**  
Applied Geometry is a college-level course intended to meet the requirements of the aerospace and robotics industries for technicians and programmers. This course focuses on the foundational axioms of geometry as they apply to lines, curves, surfaces, and shapes from both two-dimensional and three-dimensional perspectives.

**IERT 104 Basic Blueprint Reading 3**  
This course allows students to achieve competence in reading and sketching technical drawings of parts and assemblies. The basic concept of ANSI and SI metric drafting symbols and standards, terminology, manufacturing process notes, and other technical materials contained in mechanical or CAD drawings are covered extensively.

**IERT 106 Numerical Control Familiarization 3**  
This course focuses on the concepts and programming of CNC milling and turning machines, but the programming principles may also be applied to many robotics control systems. Coverage of operator panels, symbols, tools, programming codes, and parameters fill-in the gaps between CNC programming and actual operation in a production environment.

**IERT 108 Basic Precision Measuring Tools 1**  
Precision manufacturing ultimately relies on the calibrated accuracy of measuring tools, equipment, and systems. This course examines the use of precision mechanical measuring devices, such as micrometers, calipers, height gauges, dial indicators, gauge blocks and sources of measurement error. Optical and laser devices are also explored.

**IERT 109 UAV Operations I 5**  
UAV (Unmanned Aerial Vehicle) technology delivers aerial transport and surveillance at a very low cost. These robotic devices require frequent maintenance, servicing and testing. This course introduces and reviews key concepts relating to this technology including DC Electronics, DC motors, flight controls and propulsion, weather, and navigational radio.

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**IERT 110 Electricity and Magnetism 2**  
Between the years 1600 and 1800, mankind's knowledge of electricity was limited to observations of electrostatic and magnetic phenomena. This course follows those observations through the development of modern electrical theory and how a better understanding of that theory is being used to create intelligent and efficient energy delivery systems.

**IERT 115 DC Circuit Analysis 5**  
This course introduces electrical units of measure and how those units are interrelated. It also explores the five basic types of electrical circuits and the rules used to solve for electrical quantities throughout those circuits. All electrical devices and systems are built on a thorough understanding of these circuits.

**IERT 118 Fluid Power 5**  
Fluid power covers both pneumatics and hydraulics, and fluid power circuits have many characteristics in common with electric circuits. This course introduces fluid power devices, circuits, and units of measure using a combination of interactive computer graphics and real world systems.

**IERT 120 Alternating Current 2**  
Alternating current (AC) forms the basis of electric power transmission and distribution throughout the world. Using computer graphics and active systems, this course explores the generation of single-phase AC and the specialized components that make it all possible.

**IERT 125 AC Circuit Analysis 5**  
Like DC, AC can be applied to five different types of circuits. AC circuits involve a broader range of components than DC circuits and require a more in-depth mathematical analysis to understand. This course visually and mathematically explores how constantly changing electrical values interact with each other over time.

**IERT 126 Analog Electronics 5**  
Analog electronics explores electronic devices and circuits that work with continuously variable physical quantities. This includes semiconductor materials, sensors, transducers, diodes, transistors, thyristors, Op-amps and other linear integrated circuits. Circuits include power supplies, regulators, DC-to-DC converters, amplifiers, oscillators, signal conditioners, phase-locked loops, modulators and mixers.

**IERT 128 Polyphase AC Power Generation & Distribution 5**  
Virtually all of the world's electrical power generation comes from three-phase generators. Having voltages and currents displaced in time requires a more complex circuit analysis than single-phase involving vectors. This course explores polyphase generators, transformers, and power distribution systems using mathematical and graphical analysis, along with specialized test equipment.

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**IERT 135 Mechanics 5**  
Mechanical systems are an integral part of automation, where materials must be moved as part of the manufacturing process. The physics of classical mechanics are explored in this course along with units of measure and simple machines. A mixture of computer animations and practical experiments bring this subject to life.

**IERT 140 Motors and Control Systems 5**  
Motors are the backbone of material handling systems. This course examines the operating principles of common DC and AC motors, how they are wired into electrical systems, and common electromechanical control circuits. It then moves on to more sophisticated electronic control using smart motor controllers and VFDs (variable frequency drives).

**IERT 145 Construction Practices and Print Reading 5**  
Control panels and systems are built to standards established by the NEC (National Electrical Code) and UL (Underwriters Laboratories). This course explores the techniques of good panel building for control systems ranging from simple electromechanical motor starters to advanced control using PLCs (Programmable Logic Controllers).

**IERT 210 Digital Logic 5**  
Digital control is at the heart of virtually all modern automated systems. This course looks at digital from within the mind of the machine and prepares students for programming PLCs, microcontrollers, intelligent sensors, and industrial networks. Bitwise logic functions, Boolean algebra, Karnaugh maps, and truth tables are explored in detail.

**IERT 212 Digital Electronics 5**  
This course is designed for students seeking employment as electronics technicians. It covers hardware design aspects not addressed in IERT 210 and it is a more comprehensive substitute for that requirement. Digital integrated circuits, from basic logic families through FPGAs, are explored through hardware and VHDL software design and implementation.

**IERT 215 Programmable Logic Controllers (PLCs) 5**  
Programmable logic controllers are industrial computers designed to replace hard-wired circuits used in past years. This course focuses on Allen Bradley's popular SLC 500 and MicroLogix controllers using LogixPro and RSLogix 500 software. A smooth transition from ladder diagrams to ladder logic establishes the basis for more sophisticated programming models.

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**IERT 220 Allen Bradley SLC 500 Processors 5**  
This course focuses on the Allen Bradley's SLC 500 processor family using RSLinx, RSLogix 500, and FactoryTalk software. The venerable SLC 500 family is explored by examining the complete instruction set and hardware interfaces. Students learn to install and configure the software tools necessary for communication, licensing, and programming.

**IERT 225 Sensors and Transducers 4**  
Process variables, like temperature, pressure, flow, depth, rotational speed, and object detection depend on sensors and transducers to provide information to the control system. This course explores the operating principles of these devices and how they are implemented in practical control systems.

**IERT 230 Programming Methodologies 5**  
Programming is a structured science that requires discipline and planning. This course introduces Statement Lists, Flowcharting, Finite State Machines, and Venn diagrams as methods of developing efficient, effective programs in a timely manner. Once the program flow is determined, it is translated to the appropriate development software.

**IERT 231 PLC Programming Projects 5**  
The RSLogix 500 simulator used in class, LogixPro, comes with seven real world interactive programming projects: Door Simulator, Silo Simulator, Traffic Simulator, Batch Simulator, Dual Compressor Simulator, Bottle Line Simulator, and Elevator Simulator. In addition, multiple labs using RSLogix and RSLinx from Rockwell Automation finalize the programming projects.

**IERT 238 Embedded Controllers 5**  
Microcontrollers embedded in dedicated systems number in the billions. This course focuses on the two main architectures in use today: Harvard and von Neumann. Development boards from Microchip and Freescale Semiconductor provide opportunities to explore brushless DC motor control, touch sensing, LCD displays, Digital Signal Processing, wireless data, and robotics.

**IERT 240 Industrial Robots using the Fanuc Robotics 200iC 4**  
This course centers on a FANUC Robotics 200iC industrial robot and covers safety, moving the robot in 3D space, collision detection, Teach Pendant Programming (TPP), and end-of-arm tooling. Students gain an understanding of the controller's internal data and file structures. Concurrent Enrollment: IERT 241

**IERT 241 FANUC Robotics Roboguide 3**  
Roboguide is a program development environment for FANUC robots that consists of a virtual 3D world where robot operations are simulated via the user program using avatars. Other 3D objects can be added for the robot to interact with. Concurrent Enrollment: IERT 240

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**IERT 245 UAV Operations II 4**  
UAV (Unmanned Aerial Vehicle) technology delivers aerial transport and surveillance at a very low cost. These robotic devices require frequent maintenance, servicing and testing. This lab course provides experience in building, testing and troubleshooting the student's own UAV as well as the pilot training required to perform functional testing.

**IERT 250 Independent Study 5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**IERT 251 Independent Study 5**  
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**IERT 254 Supervisory Control & Data Acquisition (SCADA) 5**  
SCADA is a technology that is used to monitor and control large processes, such as power generation, that may cover thousands of square miles. This course presents the nomenclature and architecture, the system's building blocks, wireless communications between sensors and control, monitoring software, and data base development.

**IERT 255 Instrumentation 5**  
Process control requires the precise monitoring of process variables. This course examines the measurement and control of temperature, liquid level, flow rate, pressure, pH, and weight. Process control diagrams, equipment maintenance, smart instrument calibration, documentation, and loop tuning with PID control are offered using equipment from major manufactures.

**IERT 256 Alternative Energy 5**  
Alternative energy is a rapidly expanding field where modern innovation has allowed older technologies to evolve at an exponential rate. This course explores electric power generation using wind power, solar power, and fuel cells. Embedded control of servo mechanism, inverters, buck-boost regulators, and power management are all key components.

**IERT 257 AutoCAD Electrical 5**  
AutoCad Electrical is CAD software developed specifically for Industrial Controls. As part of the Autodesk community, this course gives EPPA students an opportunity to work with a first-rate design program while learning to adhere to standards developed by UL, NFPA (NEC), and the IEC.

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**IERT 258 Automation Studio 5**  
Automation Studio is a powerful software package from Famic Technologies used to design and test Allen Bradley RSLogix 500 programs with electrical, pneumatic, and hydraulic circuits. The resulting animations visually mimic the actions of the circuits they represent and can be used with confidence to understand equipment operation.

**IERT 259 Microsoft's Robotics Studio 5**  
Robotics Studio is an integrated development environment for creating robotics control programs and 3D simulations. Novice developers start programming with VPL (Visual Programming Language) and then advance to higher level languages using Visual Studio. An exciting mixture of gaming and industrial technologies, this product serves hobbyist, scientist, and industrial professionals.

**IERT 260 Programming in Alice 5**  
NXT Robots sport a powerful 32-bit microcontroller. Entry-level users develop programs for their mechanical creations using an object oriented development environment from LabView. This course employs a variety of challenging robotic designs. Fully supported by Microsoft's Robotics Studio, NXT robots can also be programmed in C or assembly.

**IERT 261 Microchip's MPLAB IDE 5**  
This course centers on programming Microchip's DSPs and high-end microcontrollers using MPLAB C. Projects cover Brushless DC motor control, Mechatronics, Touch Sensing, Speech Processing, Interactive Process Simulations, and Video Simulations. Completion of IERT 230 and IERT 238 is highly recommended as a prerequisite for this course.

**IERT 262 Wireless Sensor Networks 5**  
Wireless sensors are becoming increasingly popular in industrial networks; smart buildings, security, access control, inventory control, RFID, SCADA, and robotics. This course explores various data formats and topologies employing ZigBee and other data protocols to create reliable and secure wireless networks that move data from a variety of sensors.

**IERT 268 Industrial Networks 5**  
Industrial process control requires that equipment be located over large areas. The controlling equipment needs to communicate with sensors and distributed control racks. This is accomplished using industrial data networks, such as Modbus, Device Net, ControlNet, Profibus, Fieldbus, and Industrial Ethernet. ZigBee wireless and short distance protocols are also covered.



	CREDITS		CREDITS		CREDITS
<b>INFORMATION TECHNOLOGY SPECIALIST</b>					
<b>INFO 101 Computer Applications Essentials</b>	5	<b>INFO 109 Employment Preparation</b>	5	<b>INFO 297 Work-based Learning Seminar</b>	1-2
This course is an introduction to the effective use of the computer at home or on the job including such topics as an introduction to application software for document processing, presentation graphics, electronic spreadsheet, and database management software using Microsoft Office.		Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.		Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>INFO 102 Fundamentals of Information Technology</b>	4	<b>INFO 110 Emerging Technologies</b>	5	<b>INFO 298 Work-based Learning – No Seminar</b>	1-18
This course provides an introduction of Information Systems principles to help students understand the relationship of advanced courses to the curriculum as a whole and to present the changing role of the information systems professional.		Discover and explore emerging technologies used in today's computing environments. Students learn about these technologies and how these trends will impact computing and society.		This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	
<b>INFO 103 Internet Applications</b>	5	<b>INFO 111 Practical Applications</b>	5		
This course is a combination of three popular internet applications: e-mail, XHTML, and web authoring. Topics also include web search skills, Mash up, social networking, and online multimedia.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.			
<b>INFO 104 A+ Essentials</b>	4	<b>INFO 291 Practical Applications</b>	1-18		
In this course, students acquire the essential skills and information needed to install, upgrade, repair, configure, troubleshoot, optimize, and perform preventative maintenance of basic personal computer hardware and operating systems. This course also prepares students for current A+ Essentials certification.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.			
<b>INFO 105 A+ Practical</b>	4	<b>INFO 292 Independent Projects</b>	1-5		
Students learn to support PC hardware in a business setting, including installation, troubleshooting, component replacement, networking, and security. They also learn to manage the Windows operating system and are prepared for current A+ Essentials certification.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.			
<b>INFO 106 Electronics Basics</b>	5	<b>INFO 293 Independent Projects</b>	1-5		
This course introduces the student to the fundamentals of electricity and electronics required to understand computer and network operations. Topics include AC theory, DC theory, electronic circuits, and other related fundamentals.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.			
<b>INFO 107 Structured Cabling</b>	3	<b>INFO 294 Independent Projects</b>	1-5		
This course introduces students to standardized cabling practices and skills needed to install standards-compliant, scalable networks.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.			
<b>INFO 108 Project Management</b>	5	<b>INFO 296 Work-based Learning Experience</b>	1-18		
This course is designed to introduce students to project management concepts and terminology. Students gain skills within a hands-on environment using project management software.		Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.			

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<b>MACHINIST</b>					
<b>MACH 111 Machine Shop Mathematics I</b>	2	<b>MACH 132 Geometric Dimensioning and Tolerancing</b>	3	<b>MACH 224 MasterCam/Solid Works</b>	5
This self paced course is an introduction to math concepts to solve problems common to the machining/manufacturing industry.		This course is an introduction to the symbolic language used on engineering drawings.		Students learn CAD/CAM, and verification software.	
<b>MACH 112 Industrial Safety I</b>	3	<b>MACH 133 Milling II</b>	3	<b>MACH 231 CNC Mill I</b>	2
This course is an introduction to the occupational safety practices common to the machining/manufacturing industry. Emphasis is placed on the application of OSHA and WISHA standards within the lab setting.		Students are introduced to basic metallurgy, including physical and mechanical properties of metal.		Students learn to write CNC Milling programs.	
<b>MACH 113 Measurement Applications</b>	3	<b>MACH 134 Advanced Machining</b>	4	<b>MACH 232 Advanced CNC Machining I</b>	5
Students learn to use precision measuring tools such as micrometers, height gages, calipers, gage blocks, and indicators.		Students learn complex lathe operations.		This course provides the student with advanced practice associated with CNC machine programs.	
<b>MACH 114 Lathe Operations I</b>	4	<b>MACH 135 Advanced Machining II</b>	4	<b>MACH 233 Advanced CNC Machining II</b>	5
Students learn to set up and run conventional lathes for facing and turning operations and to perform basic machining skills.		A continuation of the concepts introduced in MACH 134, students learn advanced grinding techniques.		A continuation of the concepts introduced in MACH 232, students work on advanced CNC machining projects.	
<b>MACH 120 Machine Shop Mathematics II</b>	5	<b>MACH 136 First Aid/CPR</b>	1	<b>MACH 289 Independent Projects</b>	1-18
A continuation of the concepts introduced in MACH 111, students learn elementary , geometry, and trigonometry as they apply to the machine shop.		Students receive training in first aid and CPR.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PRE-REQUISITE: Instructor permission is required to enroll in this course.	
<b>MACH 121 Lathe Operations II</b>	4	<b>MACH 142 Advanced Machine Shop Applications</b>	8	<b>MACH 290 Independent Projects</b>	1-18
A continuation of the concepts introduced in MACH 114, students learn more advanced turning skills using taper attachment, single point threading, knurling, boring head, bandsaw blade welding and drill grinding.		Students plan and produce an advanced project of their own design with the permission of the instructor. This course may only be used as a substitution for WBAS 101for students with documented health issues.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PRE-REQUISITE: Instructor permission is required to enroll in this course.	
<b>MACH 122 Grinding I</b>	2	<b>MACH 211 Machining III</b>	1	<b>MACH 291 Independent Projects</b>	1-18
Students learn to set up and use a surface grinder.		This course is an introduction to cutter terminology and applications.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PRE-REQUISITE: Instructor permission is required to enroll in this course.	
<b>MACH 123 Machining I</b>	2	<b>MACH 212 Manufacturing Support</b>	1	<b>MACH 292 Independent Projects</b>	1-5
This course is an introduction to basic machining tools and processes including mechanical forces and metal removal.		This course is an introduction to lean manufacturing, ISO standards, and measuring systems analysis.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PREREQUISITE: Instructor permission is required to enroll in this course.	
<b>MACH 124 Milling I</b>	2	<b>MACH 213 Advanced Machining III</b>	5		
Students learn conventional milling machine techniques		Student learns to machine and assemble complex components.			
<b>MACH 125 Statistical Process Control</b>	3	<b>MACH 216 Blueprint Reading II</b>	5		
Introduction to the theory and applications of statistical process control as used in a machining/manufacturing/production environment.		Students learn advanced dimensioning, tolerancing, practices, and multiple views.			
<b>MACH 126 Blueprint Reading I</b>	2	<b>MACH 217 Blueprint Reading III</b>	2		
Introduction to blueprint reading including part specifications, views, ANSI, and SI metric drafting symbols.		Students learn to interpret complex engineering drawings.			
<b>MACH 131 Industrial Safety II</b>	2	<b>MACH 221 CNC Lathe I</b>	2		
Students learn common occupational safety practices within the lab setting.		Students learn to set up and use a computerized numerical control (CNC) lathe.			
		<b>MACH 222 CNC Lathe II</b>	5		
		Students learn advanced practices using the CNC lathe.			
		<b>MACH 223 Machining IV</b>	2		
		Students expand knowledge of advanced manual machining concepts.			

	CREDITS
<p><b>MACH 293 Independent Projects</b> 1-5</p> <p>This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PREREQUISITE: Instructor permission is required to enroll in this course.</p>	
<p><b>MACH 294 Independent Projects</b> 1-5</p> <p>This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PREREQUISITE: Instructor permission is required to enroll in this course.</p>	
<p><b>MACH 295 Independent Projects</b> 1-5</p> <p>This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PREREQUISITE: Instructor permission is required to enroll in this course.</p>	
<p><b>MACH 296 Work-based Learning Experience</b> 1-18</p> <p>Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.</p>	
<p><b>MACH 297 Work-based Learning Seminar</b> 1-2</p> <p>Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.</p>	
<p><b>MACH 298 Work-based Learning – No Seminar</b> 1-18</p> <p>This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.</p>	

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## CREDITS

**MARKETING AND BUSINESS MANAGEMENT****MARK 101 Marketing Principles 5**

This course introduces the student to the basic components of marketing goods and services with a focus on the following subject matter: basic consumer needs, creating and implementing a marketing strategy and the study of general marketing principles.

**MARK 102 Customer Service 5**

This course examines the techniques and processes to create a company wide customer service environment. Students will sharpen their skills in the areas of critical thinking, acquiring and retaining customers, and developing a service-oriented mindset, ensuring customer satisfaction, diffusing unsatisfactory situations and excelling in communication.

**MARK 103 Written Business Communication 3**

This class focuses on expressing plans, ideas and other business-based communication in written form. Students will demonstrate the ability to communicate through writing to clients, customers and co-workers at all levels.

**MARK 104 Business Negotiations and Collaboration 3**

This course presents a perspective of how to respond and resolve conflict through collaborative negotiations with positive results. Included are a variety of methods to establish rapport, trust and reliability, manage conflict in the negotiation process, and how to handle difficult power tactics.

**MARK 105 Information Research and Acquisition 1**

The ability to successfully research and acquire relevant information is very important in the competitive world of marketing. This class teaches how to utilize resources and sources to obtain and utilize that information.

**MARK 106 Business Concepts 5**

A wide array of business concepts are explored in this class including entrepreneurship, organizational systems, finance, marketing, management and international business.

**MARK 107 Cross Cultural Communications 5**

Students study the concepts of culture and its impact on organizations as they conduct business globally. Topics explored include: intercultural and cross-gender communication, political and economic philosophy, social structure, religion, language and education.

## CREDITS

**MARK 108 International Trade Practices 5**

This course is an introduction to the key business concepts that individuals and businesses must understand to enhance results in international trade.

**MARK 109 Economics: A Marketing Perspective 5**

A study of economics, economic environments, and analysis of the economic factors involving the essentials of demand and supply; competition and monopoly; labor; public policy towards business; and the distribution of income.

**MARK 110 Principles of Management and Supervision 5**

Basic principles of management and supervision are studied and practiced. Students learn leadership skills related to working styles, coaching skills and working effectively with coworkers and subordinates.

**MARK 111 Cyber Marketing/ E-Commerce 5**

This class researches business organizations that market and sell on the Internet and assesses the impact of e-commerce on business and consumers.

**MARK 112 Business Law 5**

This class is designed as an introduction to the legal system and its impact and functions within the business world. Students will study legal reasoning, the process of resolving disputes and contractual agreements in the business community.

**MARK 113 Accounting Principles 5**

This course is an introduction to financial accounting principles and management accounting.

**MARK 121 Branding/Corporate Identity 2**

Students study the importance and impact of branding techniques and the creation of corporate identity in marketing products and services.

**MARK 122 Advertising: Creation and Planning 4**

This course explores planning aspects of promotional efforts and creation of effective advertising campaigns including student development of flyers, brochures, newsletters, direct mail packages and media releases

**MARK 123 Business Software Applications 3**

Students learn to expedite projects and planning efforts utilizing business software applications. This will help them in efficiency, time management and organization.

**MARK 124 Sales Strategies and Consumer Psychology 5**

This course examines the psychology of consumer behavior and use of sales strategies created to enhance consumer behavior in purchasing.

## CREDITS

**MARK 125 Business and Marketing Presentation Skills 3**

Students develop the skills to create and deliver presentations that influence colleagues, clients and other audiences.

**MARK 126 Planning and Leadership 5**

This course is a general course for developing planning and personnel management skills required for successful sales, marketing, and managerial professionals.

**MARK 127 Public Relations 3**

This course examines how a firm gains audience exposure through the strategic placement of topics of public interest and news items that do not require direct payment. Students explore the role of public relations in marketing, how it differs from advertising, and the steps to develop a public relations campaign.

**MARK 128 Marketing Research and Forecasting 3**

This is an introductory course to the purposes, methods, and techniques of marketing research and the principles on which they are based.

**MARK 129 Advanced Marketing Projects 5**

Students complete independent marketing projects, such as business or marketing plan development, advertising project development, international marketing project development, advanced project risk analysis assessment, or international marketing research. Requires instructor approval prior to registration.

**MARK 201 Introduction To Leadership Skills and Ethics 3**

This course is an introduction to the various skills necessary to become an effective leader whether that role is as a member of a group, team leader, department head, supervisor or manager. This class also explores moral principle, decision making, community standards, corporate, community and personal responsibility.

**MARK 202 Introduction To Strategic Marketing 4**

This course delves deeper into marketing strategies enabling students to identify and minimize the effect of competitive forces. Organizational strategic planning efforts to communicate products and services are explored.

**MARK 203 Introduction To Business Accounting/Finance 5**

This course is designed for non-financial managers and introduces the accounting process, key financial documents, ratios and profit analysis.

	CREDITS
<b>MARK 204 Introduction To Presentation and Facilitation Skills</b>	<b>3</b>
In this course, students enhance personal presentation skills in a variety of settings, from large groups to small business meetings. Meeting facilitation tactics are introduced and practiced as a part of this course.	
<b>MARK 205 Advanced Business Projects</b>	<b>5</b>
Students complete independent marketing projects, such as business or marketing plan development, advertising project development, international marketing project development, advanced project risk analysis assessment, or international marketing research. Requires instructor approval prior to registration.	
<b>MARK 206 Teaming for Success</b>	<b>3</b>
Students learn to apply successful leadership models, analyze personal leadership styles, understand and synergize the dynamics of a team and appropriately empower people to make correct team and organizational decisions.	
<b>MARK 207 Introduction To Managing Change</b>	<b>3</b>
This course presents information on how leaders seek out, initiate, support, and manage needed change. Concepts explored included the process of change, communication, and building commitment to bring about change within an organization.	
<b>MARK 208 Achieving Results Through Influence</b>	<b>3</b>
This course explores how effective leaders achieve results through and with others. Students learn how effective leaders persistently go after goals and measure success in terms of results achieved.	
<b>MARK 209 Entrepreneurial Concepts</b>	<b>5</b>
A relevant course looking at ways to start and sustain a small business, students learn techniques on how to maximize limited resources, plan for growth, and remain profitable in today's economy. A detailed business plan as an individual project is completed.	
<b>MARK 210 Introduction to Project Management</b>	<b>4</b>
This course is an exploration of practical skills that will enable students to better gain control of, and manage all aspects of business-oriented projects and increase team performance.	
<b>MARK 221 International Business Law</b>	<b>2</b>
This course examines legal aspects of conducting business in a global environment, including U.S., foreign, and international legal systems and their affect on companies conducting global business; identifies customs, taxation and global employment regulations.	

	CREDITS
<b>MARK 222 Supply Chain Operations</b>	<b>5</b>
This course introduces the student to concepts of managing a supply chain on a global level including supply chain operational options such as transportation modes, inventory, time management, landed costs and customs requirements are studied.	
<b>MARK 223 Supply Chain Risk Management</b>	<b>2</b>
This course provides an overview to risk management activities including aspects of the operation, marine insurance, transportation, international conventions, international conditions and cargo protection.	
<b>MARK 224 Supply Chain Intermediaries</b>	<b>5</b>
This course introduces students to various types of supply intermediaries such as carriers, third party logistics providers, freight forwarders and brokers, U.S. customs regulations and foreign import requirements.	
<b>MARK 225 International Marketing</b>	<b>3</b>
This course offers an introduction to international marketing strategies and decisions, including the evaluation of environments to determine viability of global market entry.	
<b>MARK 226 Offshore Procurement Process</b>	<b>2</b>
Instruction introduces students to offshore procurements and the logistical elements involved with importing.	
<b>MARK 227 International Market Research and Planning</b>	<b>3</b>
This course focuses on methods used to conduct viable market research appropriate to international environments and cultures.	
<b>MARK 228 Global Trade Financing</b>	<b>5</b>
Students explore various options for financing international trade including financial policies	
<b>MARK 229 International Payment, Credit, and Collections</b>	<b>5</b>
This course examines methods and terms of payment for goods and services associated with global/multinational trade.	
<b>MARK 230 Advertising Project-Marketing Implementation</b>	<b>1-5</b>
Complete independent marketing projects, such as business or marketing plan development, advertising project development, international marketing project development, advanced project risk analysis assessment, or international marketing research. Requires instructor approval prior to registration.	

	CREDITS
<b>MARK 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>MARK 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>MARK 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>MARK 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>MARK 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>MARK 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>MARK 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

	CREDITS
<b>MECHANICAL ENGINEERING</b>	
<b>MET 101 Computers As An Engineering Tool</b>	<b>4</b>
Students learn how to navigate through the college's network, intranet and to utilize the Internet for program-related research. Folder and file creation and maintenance will also be taught.	
<b>MET 103 Drawing Sheet Standards</b>	<b>4</b>
Using computer-aided-drafting (CAD) software, students learn how to create electronic drawing templates with requisite layers, line types and text styles. Drawing sheet attributes are also be addressed as students customize relevant settings.	
<b>MET 105 Orthographic Projections</b>	<b>7</b>
Working with the "glass box" concept of orthogonally projecting an object to the six planes of view, students learn the necessity of strict adherence to the American Standard Arrangement of Views. First angle projection, used primarily in Europe and Asia are also discussed.	
<b>MET 106 Sectional Views</b>	<b>5</b>
Students learn to develop an acceptable drawing of section views and to crosshatch the areas sectioned with sectioning lines appropriate to the material in use.	
<b>MET 107 Auxiliary Views</b>	<b>5</b>
Proper dimensioning practice dictates that the drafter dimension features (surfaces and angles) only in those views where they are true shapes. Using projection techniques students learn how to "normalize" features found in orthogonal views.	
<b>MET 109 Annotative Scaling in AutoCAD</b>	<b>4</b>
Students study the standards set for dimensioning set by the American National Standards Institute (ANSI) and the American Society of Mechanical Engineers (ASME) in order to understand the principals of proper dimensioning practices. They then apply those practices to the dimensioning of drawing previously created.	
<b>MET 110 Dimensioning Practices</b>	<b>7</b>
This course is essentially the lab portion of MET 108 in that students dimension all orthogonal, sectional, and auxiliary drawings that were developed in earlier courses. Particular attention is paid to strict adherence to industry standards.	
<b>MET 111 Tolerancing</b>	<b>5</b>
Tolerance dimensions allow the specification of a range of accuracy for the shape, size and/or position of features of a product. Students learn how to apply tolerances as they consider fit between mated parts, how features will be inspected, and how to place tolerance symbols on a drawing using CAD software.	

	CREDITS
<b>MET 112 Basic Geometric Constructions</b>	<b>6</b>
Using computer-aided-drafting (CAD) software, students learn how to generate all standard geometric and conic forms. Extensive work is required in the development of tangent arcs and planes.	
<b>MET 114 Introduction to Sketching</b>	<b>5</b>
Engineering technicians, working in the field, are often required to hand draw parts, features of parts, and assemblies. This course teaches students to develop basic sketching skills so that they will be able to develop accurate and readable sketches.	
<b>MET 201 Machine Shop Drawings</b>	<b>4</b>
Students learn how to draw and dimension working/production drawings necessary for machining, fabrication and/or assembly. The ability to fully annotate production drawings (general and specific notes, parts lists, and revision notes) is also an instructional objective of this course.	
<b>MET 202 Threads, Fasteners, and Springs 3</b>	<b>3</b>
Students learn how to draw detailed, schematic and simplified threads for all thread forms common to industry. Thread specifications are examined thoroughly as are standard and specialized screw/bolt head types. Helical springs (compression, extension and torsion) are also be examined.	
<b>MET 203 Gears</b>	<b>4</b>
Students study the characteristics of spur, worm and bevel gears and learn to calculate the gear ratio and rpm of two mating spur gears. Given the pitch diameters, these gears, and their respective tooth forms, a detailed drawing is created.	
<b>MET 204 Cams</b>	<b>4</b>
This course provides students with the ability to develop displacement profiles for cams based upon given specifications and follower motions. A series of cams will then be drawn from these profiles.	
<b>MET 205 Pneumatic/Hydraulic Symbols</b>	<b>3</b>
Students study common pneumatic and hydraulic symbols and develop computer-aided-drafting (CAD) symbols appropriate for industry applications.	
<b>MET 206 Piping and Instrumentation Drawings</b>	<b>4</b>
Using the symbols developed in MET 205, students replicate industrial piping/process and instrumentation drawings (P&IDs).	
<b>MET 207 Valve Sections</b>	<b>4</b>
Students develop sectional views of gate, globe, and check valves displaying details of all components. Addition study of valve applications may be provided through independent work in the Fire Protection Engineering program.	

	CREDITS
<b>MET 208 Pump Section</b>	<b>4</b>
The application of various pump classes and types is examined in order to determine how they add hydraulic energy to the movement of water. As with valves in MET 207, sectional views of a variety of pumps are developed in order to facilitate the students' understanding of their function.	
<b>MET 209 Production Drawings</b>	<b>4</b>
Given duct system characteristics for airflow requirements, students develop detailed drawings of ventilation systems. Students complete these drafting projects in cooperation with the Sheet Metal Technology program.	
<b>MET 210 Duct Fitting Symbols</b>	<b>3</b>
Students study common sheet metal duct fittings and develop computer-aided-drafting (CAD) symbols appropriate for industry applications.	
<b>MET 211 Flat Pattern Development</b>	<b>5</b>
Using the principles of triangulation and radial line development, students develop flat patterns for such common types of sheet metal fittings as elbows and transitions.	
<b>MET 212 Basic Air Flow Systems</b>	<b>3</b>
Students study the means by which air is distributed in mechanically ventilated spaces by means of fans, ductwork, and diffusers.	
<b>MET 213 Paper Space, Layout, and Viewports</b>	<b>5</b>
Students learn to use space, layout, and viewports when working on CAD projects.	
<b>MET 214 Engineering Projects I</b>	<b>7</b>
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.	
<b>MET 215 Axonometric Drawings</b>	<b>5</b>
Students learn to differentiate between types of axonometrics and to draw axonometric drawings including plan obliques and isometrics.	
<b>MET 216 Engineering Projects II</b>	<b>7</b>
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.	

	CREDITS
<b>MET 217 Career Advancement Strategies</b>	<b>3</b>
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.	
<b>MET 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>MET 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>MET 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>MET 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>MET 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>MET 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>MET 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

## OCCUPATIONAL THERAPY ASSISTANT

	CREDITS
<b>OTA 111 Introduction to Occupational Therapy</b>	<b>5</b>
This course provides an overview of the OTA program and the profession and the roles and responsibilities of OT practitioners in health care, community-based settings and school systems. Basic terminology, principles, philosophies and ethics are introduced for a better understanding of occupational therapy, the clients served, and other health care professionals working in the settings. Students gain computer literacy skills and library skills for accessing information about professional issues.	
<b>OTA 102 Health and Wellness and the OTA</b>	<b>3</b>
Principles and strategies for managing health and promoting wellness are practiced. Importance of balancing areas of occupation for success in occupational roles are examined and applied.	
<b>OTA 103 Functional Movement</b>	<b>5</b>
This course covers basic principles of kinesiology, biomechanics, and associated biological systems related to daily living activities. Techniques for body mechanics, safety and mobility, energy conservation, task simplification are covered. Upper extremity functions for everyday tasks are emphasized.	
<b>OTA 104 Therapeutic Use of Self</b>	<b>5</b>
Students in this course explore personal values and cultural attitudes that relate to individual performance and group interactions. Group roles, learning styles, leadership, and communication styles will be examined. Students develop basic skills for observation, interviewing, communication and documentation. Personality, insights, perceptions and judgments as part of the therapeutic process are covered.	
<b>OTA 105 Nervous System Functionin</b>	<b>4</b>
Basic principles of neurology and associated sensory and cognitive systems related to daily living activities. Deficits in sensory, perceptual and cognitive functioning and effects on occupational performance are examined.	
<b>OTA 106 Therapeutic Activities and Performance I</b>	<b>5</b>
This course covers areas of human occupation through analysis of activities of daily living- work, leisure, play and self-care. Students develop an understanding of the nature and value of occupation to support client participation and performance through therapeutic crafts and daily living activities.	

	CREDITS
<b>OTA 107 Developmental Disabilities and OT</b>	<b>5</b>
Congenital conditions, diseases, and disabilities are covered and their effects on the psychological, physiological, and social domains of occupational behavior. Students develop observation and assessment skills, and teaching and grading self-care, work, leisure and play occupations for individuals with developmental challenges.	
<b>OTA 108 Applied Experience –Fieldwork Level-I A</b>	<b>1</b>
Students participate in observations and guided practice opportunities for applying OT principles in settings serving individuals with developmental, psychosocial or physical challenges.	
<b>OTA 109 Adaptive Technologies</b>	<b>5</b>
Adaptive technology used in occupational therapy setting is explored through laboratory practice and field site visits. Low technology such as prosthetics, positioning equipment and adaptive aides for daily living to more advanced computer technology utilized for environmental control and augmentative communication are covered.	
<b>OTA 110 Documentation Skills</b>	<b>3</b>
Students learn about record keeping, progress note writing, and assisting the OT with functional goals and objectives for various OT settings. Overview of terminology of assessment results and treatment plans covered.	
<b>OTA 201 Therapeutic Activities and Performance II</b>	<b>5</b>
More advanced course to develop creative problem-solving, clinical reasoning, and documentation skills through exposure to barriers for safety and independence. Models and theories of occupation are applied and the effects on performance are examined. Students examine universal design principles and environmental modifications for work, home and the community.	
<b>OTA 202 Psychosocial Dysfunctions: Treatment &amp; Applications</b>	<b>8</b>
Conditions that lead to psychiatric and social-emotional challenges are examined. Clinical features, medical management and issues impacting OT are covered. This course focuses on the further development of observation, assessment skills, task analysis and interventions for individuals with psychosocial challenges. Quality of life and meaningful occupations are emphasized.	

			CREDITS
OTA	203	<b>Applied Experience – Fieldwork Level-I B</b>	1
Students participate in observations and guided practice opportunities for applying OT principles in settings serving individuals with developmental, psychosocial or physical challenges.			
OTA	204	<b>Seminar – Applied Mental Health</b>	1
Discussion and problem-solving of fieldwork experiences are emphasized.			
OTA	210	<b>Physical Disabilities: Treatment and Applications</b>	8
Trauma, illness, and other conditions that lead to physical dysfunction are examined. Therapy modalities to maximize independence, safety and participation in meaningful occupation are practiced. This course focuses on the further development of the student's skills in clinical reasoning carrying out the treatment plan.			
OTA	231	<b>OTA and Special Settings</b>	4
Some settings require the OT assistant to be an independent self-starter. Occupational therapy practice with elderly clients in long term care, assisted living and home health care, pediatric clients in school settings, and injured workers in work condition programs are covered.			
OTA	212	<b>Applied Experience – Fieldwork Level-I C</b>	1
Students participate in observations and guided practice opportunities for applying OT principles in settings serving individuals with developmental, psychosocial or physical challenges.			
OTA	213	<b>Seminar – Applied Physical Rehabilitation</b>	1
Discussion and problem-solving of fieldwork experiences are emphasized.			
OTA	232	<b>Professional Issues for the OTA</b>	4
Preparation for fieldwork, certification and employment of the OTA, as well as, workplace issues and job-related responsibilities of OTA are covered. The OTA as a manager, contractor, private practitioner and advocate of occupational therapy services are presented.			

			CREDITS
OTA	220	<b>Clinical Fieldwork Level II – Rotation A</b>	11
The first of two eight-week off-campus work experiences in a clinical setting under the supervision of a licensed occupational therapist or a certified occupational therapy assistant. This forty-hour per week rotation is to further develop and practice the skills of an entry-level OTA and must be successfully completed before student is eligible for the national certification examination.			
OTA	221	<b>Clinical Fieldwork Level II – Seminar A</b>	1
Discussion and problem-solving of fieldwork experiences and preparation for the national board exam are emphasized.			
OTA	222	<b>Clinical Fieldwork Level II – Rotation B</b>	11
The second of two eight-week career experiences working in a clinical setting under the supervision of a licensed occupational therapist or a certified occupational therapy assistant. This forty-hour per week rotation is to further develop and practice the skills of an entry-level OTA and must be successfully completed before student is eligible for the national certification examination.			
OTA	223	<b>Clinical Fieldwork Level II – Seminar B</b>	1
Discussion and problem-solving of fieldwork experiences and preparation for the national board exam are emphasized.			

CREDITS



	CREDITS		CREDITS		CREDITS
<b>POWER SPORTS &amp; EQUIPMENT TECHNOLOGY</b>					
<b>POW 101 Introduction to Power Sports</b>	5	<b>POW 140 Fundamentals of Electricity</b>	3	<b>POW 161 Chassis Service</b>	5
This course provides students with training in workplace human relations, communications, shop safety environmental awareness, tools and equipment, measuring, fasteners, and mechanical and mathematical principles required within the occupation.		This course is an introduction to electrical systems. Students receive electrical and electronic theory, learn to use electrical test equipment, and provide basic electrical systems inspections and service.		Service/technician students receive shop experience in maintaining or repairing frame and suspension systems including steering systems, wheels/tire assemblies, and suspension systems.	
<b>POW 102 Pre-Delivery Maintenance</b>	3	<b>POW 141 Electrical Systems</b>	5	<b>POW 162 Advanced Projects</b>	7
Students learn to prepare new equipment for delivery to the consumer.		Students are introduced to the electrical systems encountered in various types of motorized vehicles. Special emphasis is placed upon the utilization of service manuals and electrical schematics.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>POW 103 Seasonal Maintenance</b>	5	<b>POW 142 Electrical Systems - Diagnosis</b>	5	<b>POW 291 Practical Applications</b>	1-18
Students learn to prepare equipment for the recreational/work season and provide the service necessary at the end of the work/recreational season.		Students receive training and practice in servicing and repairing the electrical systems of various types of motorized vehicles. This includes problem identification, diagnostic testing, repair, and maintenance of batteries, starting, charging, ignition, and accessory systems.		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>POW 104 Periodic Maintenance</b>	5	<b>POW 143 Brake Systems</b>	4	<b>POW 292 Independent Projects</b>	1-5
Students learn to build their skills in maintaining optimum equipment/vehicle performance during the work/recreational season.		Students are introduced to brake theory, identification, diagnosis of problematic brake systems and the repair and maintenance of various brake systems.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>POW 120 Engines – Failure Analysis</b>	5	<b>POW 150 Introduction to Power Trains</b>	3	<b>POW 293 Independent Projects</b>	1-5
Students are introduced to the theory of internal combustion engines and learn how to diagnosis problematic engines and analyze failed engines.		Students are introduced to power train theory, gear ratios, diagnosis of problematic power trains, and analysis of failed power trains.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>POW 121 Engine Repair Methods</b>	5	<b>POW 151 Power Train Service</b>	5	<b>POW 294 Independent Projects</b>	1-5
Students learn to correctly disassemble, inspect, and machine engines to return to service. Special emphasis is placed upon the utilization of service manuals and manufacturers' guidelines.		Students receive training in the servicing and repairing of the various modes of transmitting engine power. This includes clutches, gear drive, belt/chain drive systems, and manual starters.		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>POW 122 Engines Installation Methods</b>	5	<b>POW 152 Introduction to Marine Propulsion</b>	3	<b>POW 296 Work-based Learning Experience</b>	1-18
Students learn to correctly assemble, perform the necessary adjustments, and correctly install engines in vehicles. Special emphasis is placed upon the utilization of service manuals and manufacturers' guidelines.		Students are introduced to marine propulsion theory, gear ratios, diagnosis of problematic propulsion systems, and analysis of failed propulsion systems.		Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>POW 130 Exhaust Systems</b>	5	<b>POW 153 Marine Propulsion Service</b>	5		
This course is an introduction to the theories of induction. Students learn to identify, diagnosis, repair, and maintain carburetor, electronic fuel injection, and direction injection systems.		Students receive training in servicing and repairing the various modes of transmitting engine power to the water. This includes marine gear drive systems and jet pumps.			
<b>POW 131 Lubrication/Cooling Systems</b>	5	<b>POW 160 Introduction to Chassis</b>	3		
Students are introduced to the theories of cooling and lubrication and learn to identify, diagnosis, repair, and maintain lubrication and cooling systems. Special emphasis is placed upon the utilization of service manuals and manufacturers' guidelines.		Students are introduced to chassis theory, design, diagnosis of problematic chassis, and chassis service/repair methods.			
<b>POW 132 Advanced Engine Service</b>	5				
Students focus on engine performance and drivability and learn to identify, diagnosis, and repair engine performance problems. Special emphasis is placed upon the utilization of service manuals and manufacturers' guidelines					

**POW 297 Work-based Learning Seminar** 1-2 CREDITS

Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**POW 298 Work-based Learning – No Seminar** 1-18 CREDITS

This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## PRACTICAL NURSE

**PNUR 201 Nursing Math/Pharmacology** 4 CREDITS

This course focus is on the practical nurse's role in medication administration to persons of all ages. Basic concepts, various medication delivery systems, dosage calculation, drug classifications, and nursing implications are presented for the various bodily systems. Safe administration and documentation of medications are presented in the laboratory setting.

**PNUR 202 Personal Vocational Relationships** 4 CREDITS

Students receive an overview of the health professions and the healthcare delivery systems with emphasis on the LPN's role in the health care working environment. Topics include nursing history, trends, disease prevention and wellness promotion, and guidelines for legal and ethical practice. Focus on the nursing process and basic therapeutic communications skills, basic human needs and healthy adjustments are also discussed with an emphasis on cultural, ethical, and religious needs. Students review legal requirements for licensure as a practical nurse. Liability issues related to practice, as well as ethical issues are discussed. Students review the Washington Administrative Code for the practical nurse and discuss scenarios of how to work within professional boundaries. Students will recognize the need for change in the structured healthcare setting and demonstrate active participation in change.

**PNUR 203 Nursing Fundamentals I/ Simulation I** 7 CREDITS

This course provides the beginning nursing core upon which all subsequent nursing courses are built with emphasis on people as holistic beings with basic human needs. Included are specific nursing care principles common to all clients. Discussion focuses on identifying the needs of individuals within a family and community environment. Students will be introduced to simulation for enhanced demonstration & mastery of beginning nursing concepts and skills.

**PNUR 220 Nursing Fundamentals II/Sim II** 4 CREDITS

This course provides advanced nursing skills necessary for successful transition into clinical settings. Included are special nursing care principles common to all clients. Discussion focuses on identifying the needs of individuals within a family and community environment. Simulation scenarios become more complex to facilitate higher level nursing concepts and skills.

**PNUR 221 Med Surg I** 7 CREDITS

This course provides an overview of the care and management of patients with cardiovascular, respiratory and neurological disorders. Diseases are studied in relation to etiology, pathophysiology, clinical signs, medical management and geriatric implications. Discussions integrate principles of pharmacology/ medication administration, diagnostic testing, and nursing interventions to assist the client's return to maximum levels of function.

CREDITS

CREDITS

**PNUR 222 Clinical I/Sim III/Clinical Math** 4 CREDITS

Within a variety of clinical settings, students begin to utilize the nursing process to give comprehensive care to diverse population of clients. Clinical experience is correlated with theory under the guidance of faculty and enables student to implement skills and apply theory learned in the classroom. Simulation will be utilized to augment clinical learning opportunities.

**PNUR 230 Med Surg II** 5 CREDITS

This course provides an overview of the care and management of patients with endocrine, GI, GU, and orthopedic disorders. The diseases are studied in relation to etiology, pathophysiology, clinical signs and symptoms, medical management and geriatric implications. Discussions integrate principles of pharmacology/medication administration, diagnostic testing, and nursing interventions to assist the client's return to maximum levels of function.

**PNUR 231 Newborn/Maternal/ Reproductive Nursing** 2 CREDITS

This course provides an overview of the practical nursing concepts of the care of women and newborns. Emphasis is on health promotion through antepartum, intrapartum, and postpartum stages of pregnancy as well as complications that may occur during pregnancy including complications of pregnancy. Discussions integrate holistic and self-care principles to assist women in general and the family as a whole. Included will be an overview of the care and management of patients with disorders of the breast and reproductive system. Diseases are studied in relation to etiology, pathophysiology, clinical signs, and medical management.

**PNUR 232 Pediatrics** 2 CREDITS

The course provides an overview of the nursing care concepts related to children and families within the healthcare setting. Discussions integrate principles of nutrition therapy, pharmacology/medication administration, cultural diversity, legal/ethical issues, and health wellness teaching which are utilized as a framework to integrate holistic and self-care capabilities for the family.

**PNUR 233 Clinical II/Sim IV** 3 CREDITS

Within a variety of clinical settings, using the experience gained in PNUR 122, students continue to utilize the nursing process to give comprehensive care to diverse population of clients. Clinical experience is correlated with theory under the guidance of faculty and enables student to implement skills and apply theory to practice. Simulation will be utilized to augment clinical learning opportunities and advanced nursing math principles will be introduced.

**PNUR 234 Clinical III/ Sim V/Clinical Math** 3 CREDITS

Within a variety of clinical settings, using the experience gained in PNUR 133, students continue to utilize the nursing process to give comprehensive care to diverse population of clients. Clinical experience is correlated with theory under the guidance of faculty and enables student to implement skills and apply theory to practice. Simulation will be utilized to augment clinical learning opportunities and advanced nursing math principles will be reinforced.

	CREDITS
<p><b>PNUR 240 Med Surg III</b> <span style="float: right;"><b>7</b></span>            This course provides an overview of the nursing care concepts related to mental health, neurological, and the eye and ear disorders. Diseases are studied in relation to etiology, pathophysiology, clinical signs, and medical management and geriatric changes. Discussions integrate principles of pharmacology/medication administration, diagnostic testing, and nursing interventions to assist client's return to maximum levels of function.</p>	
<p><b>PNUR 241 Clinical III/Sim VI/Clinical Math</b> <span style="float: right;"><b>4</b></span>            Within a variety of clinical settings, using the experience gained in PNUR 134, students continue to utilize the nursing process to give comprehensive care to diverse population of clients. Clinical experience is correlated with theory under the guidance of faculty and enables student to implement skills and apply theory to practice. Simulation will be utilized to augment clinical learning opportunities and advanced nursing math principles will be reinforced.</p>	
<p><b>PNUR 242 Preceptor Experience</b> <span style="float: right;"><b>4</b></span>            This course includes an experience with a staff licensed practical nurse as a mentor or preceptor in a selected clinical area for the student's final clinical experience.</p>	
<p><b>PNUR 233R Independent Project</b> <span style="float: right;"><b>3</b></span>            This course offers students an opportunity to work on lab-based clinical performance improvement in addition to clinical learning component. The project is based on prior clinical work deficiencies identified in PNUR 233 and are designed for the achievement of Clinical II objectives.</p>	
<p><b>PNUR 234R Independent Project</b> <span style="float: right;"><b>3</b></span>            This course offers students an opportunity to work on lab-based clinical performance improvement in addition to clinical learning component. The project is based on prior clinical work deficiencies identified in PNUR 234 and are designed for achievement of Advanced Clinical II objectives.</p>	
<p><b>PNUR 241R Independent Project</b> <span style="float: right;"><b>4</b></span>            This course offers students an opportunity to work on lab-based clinical performance improvement in addition to clinical learning component. The project is based on prior clinical work deficiencies identified in PNUR 241 and are designed for achievement of Clinical III objectives.</p>	

CREDITS

CREDITS

	CREDITS
<b>SHEET METAL TECHNOLOGY</b>	
<b>SHME 101 Introduction to Sheet Metal Technology</b>	<b>3</b>
Students are introduced to basic hand tools and machines that are used within the sheet metal shop atmosphere. Students are provided instruction and training in workplace human behaviors and interpersonal skills required within the sheet metal occupation. Attendance, punctuality, self-management skills, classroom, shop participation and employer expectations are emphasized.	
<b>SHME 102 Metalworking Machines Technology</b>	<b>4</b>
Students learn how to use various specialty hand and power operated metalworking machines in the shop atmosphere that were introduced in SHME 101. These include metal cutting shears, bending machines, forming machines, and common power tools.	
<b>SHME 103 Fittings Fabrication I</b>	<b>7</b>
Students learn how to fabricate a variety of commonly used heating and air conditioning (HVAC) elbows, "Y" branches, and transitional fittings. Students assemble fabricated fittings to form a maze and fabricate custom fittings to complete final assembly. This area of the program begins developing student's technical reading skills.	
<b>SHME 104 Principles of Health and Safety</b>	<b>5</b>
Students are introduced to the principles of safety and health and hazardous communications as they relate to construction. An introduction to the OSHA/WISHA guidelines, occupational standards are included. Students complete written assignments on these subjects. Students apply various principles in the shop area and as they proceed through the program.	
<b>SHME 105 Materials Technology</b>	<b>3</b>
Students are introduced to and learn how to apply various elements of material handling and transporting goods used in the sheet metal industry. The subjects covered are tying knots, crane signals, creating travel plans and becoming certified for a straight mast forklift operator.	
<b>SHME 106 Hand Tools and Equipment</b>	<b>4</b>
Students learn how to properly use various specialty hand tools in the shop atmosphere and are instructed on the proper use of circumference rulers, framing squares, numerous marking tools, metal cutting shears and joining tools.	

	CREDITS
<b>SHME 107 Applied Math</b>	<b>5</b>
Students are introduced to and develop the skills to understand and solve mathematical problems that have direct application to the fabrication and cost estimation of sheet metal components. These assignments include the foundational principals of basic mathematics with equations involving fractions, decimals, percentages, practical geometry construction and trigonometry.	
<b>SHME 108 Introduction to Drafting</b>	<b>2</b>
Students are introduced to basic terminology, drafting lines, labeling and object projection. Using the proper techniques, students create by hand drafting assignments that develop basic, orthographic and isometric views of shapes and sheet metal components.	
<b>SHME 109 Drafting Techniques</b>	<b>5</b>
Students develop the skills necessary to visualize, draft and understand common and complex sheet metal components. Students apply triangulation principles and are introduced to parallel line development techniques. Pre-requisite: SHME 108	
<b>SHME 110 Layout Math</b>	<b>3</b>
Students learn how to apply additional mathematical functions to perform pattern and line development for assorted arch lengths, squares, rectangles, and round fittings commonly used in the sheet metal industry. Pre-requisite: SHME 107	
<b>SHME 111 Technology of Seams and Locks</b>	<b>3</b>
Students use a variety of machines to form complex seams, cleats, kinks and locks used in the fabrication and assembly of ventilation fittings. Pre-requisite: SHME 102	
<b>SHME 112 Fittings Fabrication II</b>	<b>8</b>
Students' mastery of fabrication and layout skills are applied with the completion of the thirty fittings exam. Thirty commonly used components are produced within thirty hours. Students exercise their critical thinking skills as well as the production techniques that they have learned to this point in the program.	
<b>SHME 120 Introduction to Sheet Metal Technology</b>	<b>3</b>
Students are introduced to basic hand tools and machines that are used within the sheet metal shop atmosphere. Students are provided instruction and training in workplace human behaviors and interpersonal skills required within the sheet metal occupation. Attendance, punctuality, self-management skills, classroom, shop participation and employer expectations are emphasized.	

	CREDITS
<b>SHME 121 Principles of Health and Safety</b>	<b>2</b>
Students are introduced to the principles of safety and health and hazardous communications as they relate to construction. Students complete written assignments on these subjects. They apply various principles in the shop area and as they proceed through the program.	
<b>SHME 122 Hand Tools and Equipment</b>	<b>3</b>
Students learn how to properly use various specialty hand tools in the shop atmosphere and are instructed on the proper use of circumference rulers, framing squares, numerous marking tools, metal cutting shears and joining tools. Pre-requisite: SHME 120	
<b>SHME 123 Metalworking Machines Technology</b>	<b>2</b>
Students learn how to use power operated metalworking machines in the shop atmosphere. These include metal cutting shears, bending machines, forming machines, and common power tools. Pre-requisite: SHME 120	
<b>SHME 124 Fittings Fabrication I</b>	<b>4</b>
Students learn how to fabricate a variety of commonly used heating and air conditioning (HVAC) elbows, "Y" branches, and transitional fittings. Students practice assembling a portion of these fittings. Students fabricate several additional custom fittings. This area of the program begins developing student's technical reading skills.	
<b>SHME 125 Applied Math</b>	<b>3</b>
Students are introduced to and develop the skills to understand and solve mathematical problems that have direct application to the fabrication and cost estimation of sheet metal components. These assignments include the foundational principals of basic mathematics with equations involving fractions, decimals, areas and an introduction to trigonometry.	
<b>SHME 126 Technology of Seams and Locks</b>	<b>2</b>
Students use a variety of machines to form complex seams, cleats, kinks used in the fabrication and assembly of ventilation fittings. Pre-requisite: SHME 123	
<b>SHME 127 Prefabricated Components</b>	<b>2</b>
The sheet metal (HVAC) production industry makes available to contractors a variety of installation components, thus saving the sheet metal worker considerable fabrication time. During this course, students learn to identify these system components and applications.	

	CREDITS		CREDITS		CREDITS
<b>SHME 128 Material Handling Technology</b>	<b>2</b>	<b>SHME 138 Preventive Maintenance</b>	<b>2</b>	<b>SHME 207 Energy Codes</b>	<b>3</b>
Students are introduced to and learn how to apply various elements of material handling and transporting goods used in the sheet metal industry. The subjects covered are tying knots, crane signals, creating travel plans.		Students learn how to perform basic preventive maintenance procedures on a variety of furnaces and heat pumps. Pre-requisite: SHME 134		Advanced students are introduced to versions of the Washington State Energy Codes, Uniform Mechanical Codes and International Residential Codes. Research is conducted to answer numerous questions about items that directly apply or are associated with the installation or fabrication practices of various sheet metal applications.	
<b>SHME 129 Wood Working Tools</b>	<b>1</b>	<b>SHME 201 Introduction to Architectural Sheet Metal</b>	<b>3</b>	<b>SHME 208 Duct Design and Air Balancing - 5 Basics</b>	
Students learn how to safely use carpentry power tools used for modifying wooden structures to accept HVAC and ducting installations.		Advanced students are introduced to principles and applications of architectural flashings, coping, gutters, downspouts, louver and conductor heads. Tasks involve design, fabrication and installation of these items.		Advanced students are introduced to terminology pertaining to this important area of the sheet metal industry. Using mathematical formulas, elements such as friction loss, dynamic loss, cubic feet per minute, feet per minute, cross sectional area, fan pulley sizes, BTUs, duct sizes and round substitutions are calculated for numerous applications.	
<b>SHME 130 Carpentry Installation</b>	<b>3</b>	<b>SHME 202 Introduction to Blueprint Reading</b>	<b>3</b>	<b>SHME 209 Duct Design and Air Balancing - 5 Advanced</b>	
Students learn to measure, lay out and cut wooden elements of the residential structure using these openings to allow for the installation of HVAC systems and ductwork. Pre-requisite: SHME 129		Advanced students are introduced to blueprint organization, terminology, sketching techniques, symbols, and lines. Using the proper techniques, students hand sketch assignments that develop oblique, perspective, isometric and orthographic projections. Students are introduced to different scales of measurements and construction materials.		Advanced students use computer programs to determine proper heating and cooling loads, friction loss, dynamic loss, cubic feet per minute, feet per minute, cross sectional area, BTUs, duct sizes, critical paths and round substitutions for numerous applications. Pre-requisite: SHME 208	
<b>SHME 131 Air Properties Technology</b>	<b>1</b>	<b>SHME 203 Blueprint Reading Applications 5</b>		<b>SHME 210 Solar Heating</b>	<b>2</b>
This course is an introduction to the properties of air, air handling principles, and HVAC system requirements.		Advanced students research information from numerous types of blueprints dealing with all aspects of the construction process. Students are assigned plans and answer questions pertaining to the computer aided designs of highly detailed ventilation systems that are installed in current applications. Pre-requisite: SHME 202		Advanced students are introduced to terminology and principals and component identification of solar energy systems. Using mathematical formulas, they determine the operating effects and missing data for simulated applications.	
<b>SHME 132 Duct installation</b>	<b>3</b>	<b>SHME 204 Layout Drafting II</b>	<b>3</b>	<b>SHME 211 Commercial Projects</b>	<b>6</b>
Student learn how to install ducting systems, to include main supply ducts, return ducts, wall stacks, and lateral ducts. Pre-requisite: SHME 124		Advanced sheet metal students continue to develop the spatial thinking skills necessary to visualize and understand more complex sheet metal components. Students apply principles dealing with parallel line and radial line development. Pre-requisite: SHME 109		Advanced sheet metal students apply their knowledge of design, lay out, and fabrication to real world, client projects. This includes handling the project from inception from client's requirements, through estimation of materials and shop costs, to completion of finished product.	
<b>SHME 133 Residential Venting Technology</b>	<b>2</b>	<b>SHME 205 Layout Drafting III</b>	<b>3</b>	<b>SHME 291 Practical Applications</b>	<b>1-18</b>
Students learn how to determine proper size and install a variety of venting examples for home heating and exhaust systems.		Advanced sheet metal students apply principles dealing with parallel line, radial line, triangulation and/or combinations of all three areas of layout. Pre-requisite: SHME 204		This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>SHME 134 Unit Operations</b>	<b>2</b>	<b>SHME 206 Complex Components Fabrication</b>	<b>5</b>	<b>SHME 292 Independent Projects</b>	<b>1-5</b>
Students learn about the operational components of various HVAC systems used in residential installations. Systems include electric furnaces, heat pumps, and gas furnaces. Pre-requisite: SHME 131		Advanced sheet metal students are challenged to apply advanced principles to design, layout, and efficiently fabricate complex HVAC ducting elbows, branches, offsets, tapers and transitions. Pre-requisite: SHME 204 and 205		This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>SHME 135 Code Principles</b>	<b>2</b>				
Students learn how to research, follow, and apply local residential and uniform building codes and guidelines as they pertain to the installation of HVAC systems, ducting, and venting.					
<b>SHME 136 Gas Piping Technology</b>	<b>2</b>				
Students learn to select appropriate size pipe, how to cut pipe, and how to use a pipe machine to allow for appropriate fittings.					
<b>SHME 137 Duct Design Technology</b>	<b>3</b>				
Students are introduced to, and learn how to use a Ductulator® to determine duct sizing. Pre-requisite: SHME 131					

## CREDITS

**SHME 293 Independent Projects 1-5**

This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**SHME 294 Independent Projects 1-5**

This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**SHME 296 Work-based Learning Experience 1-18**

Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**SHME 297 Work-based Learning Seminar 1-2**

Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**SHME 298 Work-based Learning – No Seminar 1-18**

This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## CREDITS

**SOFTWARE DEVELOPMENT****SOFT 101 Computer Concepts 5**

This course provides an overview of basic computer concepts as they apply to MIS professionals. Emphasis is on basic machine architecture including data storage, manipulation, the human-machine interface including the basics of operating systems, algorithms and programming languages.

**SOFT 102 Programming Fundamentals 5**

In this course, students are provided with the fundamental skills needed for designing computer programs. Focus is on problem analysis and developing algorithms for the step by step solutions to problems

**SOFT 103 Operating Systems 5**

This course is designed to introduce the student to an operating system environment. Instruction includes installation and configuration; learn your way around the desktop, as well as building skills using commands.

**SOFT 121 C-Sharp I 5**

This hands-on course is ideal for learning programming in a Windows environment. Topics include: introduction to C#, controls, variables, constants, dialog boxes, menus, lists, loops and arrays. This class incorporates basic concepts of programming, problem solving, and programming logic and design techniques. PREREQUISITE: Programming Fundamentals

**SOFT 122 C-Sharp -II 5**

This in-depth course will explore intermediate and advanced technologies using the .NET framework. Topics include conditional statements, objects, structures, classes, properties, inheritance, exception handling, string formatting, file handling, and language fundamentals. PREREQUISITE: SOFT 121

**SOFT 132 C++ II 3**

This course includes object-oriented design in the C++ language. Topics covered include inheritance, Dynamic memory allocation, namespaces and code reuse. Prerequisite: JAVA I

**SOFT 142 Programming in JAVA II 5**

Develops fundamental concepts and techniques for analysis, design, and implementation of computer programs using an object-oriented language. Includes graphical user interfaces, event driven programming, recursive techniques, and simple data structures. Prerequisite: Java I

**SOFT 204 Open Source Programming 5**

This course leverages the knowledge gained in previous courses in do development in an open source environment. Students will work in a Linux environment and utilize an open source programming language and open source database software. Prerequisites SQL, Operating System and JAVA II.

## CREDITS

**SOFT 205 Visual Basic I 5**

This course introduces event-driven computer programming using the Visual BASIC programming language. Topics include input/output operations, syntax, program structure, data types, arithmetical operations, functions, loops, conditional Statements and other related topics. Prerequisite: SOFT 102

**SOFT 206 Visual Basic II 5**

This is an advanced course for Visual Basic.NET, an object-oriented, event-driven language that is a subset of the Visual Studio.NET environment. It is designed to provide programmers familiar with the basic concepts and functionality of Visual Basic.NET with the tools to create more robust application programs. Prerequisite: SOFT 205

**SOFT 207 Dynamic Web Pages 5**

Students design and implement an interactive, data-driven Website using C# and ASP.net. Topics include objects and inheritance; debugging and error handling; managing state and a database server and users; security; and best practices. Prerequisite: SOFT 122

**SOFT 208 Principles of System Analysis and Design 5**

This course examines the spectrum of requirements for the design, planning, and implementation of computer systems. Through case studies, students will analyze existing situations in order to propose new systems solutions

**SOFT 209 Emerging Technologies 5**

This course offers students an opportunity to independently research a technology that is determined by both the instructor and the student. Students will use the acquired skills to create a project or presentation.

**SOFT 210 Mobile Device Programming 5**

Students in this course will be introduced to the development process for creating applications for mobile devices. The course will utilize the JAVA programming language and work with device emulators. Prerequisite: JAVA II

**SOFT 290 Capstone Project 5**

This course offers students an opportunity to work on a project researching and applying skills and technologies learned. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**SOFT 291 Practical Applications 1-18**

This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

	CREDITS
<b>SOFT 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>SOFT 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>SOFT 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>SOFT 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>SOFT 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>SOFT 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

## WEB DEVELOPMENT

	CREDITS
<b>WEB 101 Microsoft Office Applications</b>	<b>5</b>
This course focuses on developing essential skills using Word, Excel, PowerPoint, and Outlook. Topics include creating and editing Word documents, and an introduction to Excel worksheets, charts, formulas and basic functions. PowerPoint focuses on enhancing presentations with illustrations and shapes. Outlook introduces essential E-mail and contact management skills. Prerequisite: Keyboarding.	
<b>WEB 102 HTML, XHTML and CSS</b>	<b>5</b>
Using a text editor, this course builds a strong foundation in HTML, XHTML, and Cascading Style Sheets (CSS) so students can migrate to HTML editors. Students write code integrating CSS right from the start to reinforce concepts and skills learned. Prerequisite: Keyboarding.	
<b>WEB 103 Operating Systems</b>	<b>5</b>
This course is designed to introduce the student to an operating system environment. Instruction includes installation and configuration; learn your way around the desktop, as well as building skills using commands.	
<b>WEB 201 Internet Technologies</b>	<b>5</b>
From browsing and searching to the latest in emerging Web technologies, this course covers essential to comprehensive topics understanding and using the Internet. Discover the technical concepts and services that make the Internet work. Current Internet trends are identified and discussed in this course. Prerequisite: Computer Concepts.	
<b>WEB 202 Web Authoring Editor</b>	<b>5</b>
This course focuses on how to design and maintain Web Pages using an industry-standard Web editor. Students practice setup of site configuration, creating and editing web pages using tables, forms, templates, Cascading Style Sheets (CSS), positioning, and media objects. Prerequisite: HTML, XHTML and CSS.	
<b>WEB 203 Photoshop for the Web</b>	<b>5</b>
Students practice how to edit, manipulate, enhance, and optimize digital images using industry-standard software. Skills covered include selection techniques, working with layers, drawing and painting, enhancing photos, applying filters, creating actions, drawing vector graphics, and creating web pages and animations.	
<b>WEB 204 Web Site Animation using Flash</b>	<b>5</b>
Students practice hands-on using Flash's drawing, image, text, animation and sound capabilities and build interactive content that can be shared over the Internet. Students will create a Flash web site, integrate Flash components and use basic ActionScript. Prerequisite: Photoshop.	

	CREDITS
<b>WEB 205 Web Site Design</b>	<b>5</b>
This course focuses on Web page planning, basic design, layout and construction of a Web site. Theories related to visual communication and design of online material will be discussed. Prerequisite: Web Authoring Editor, Photoshop for the Web and Site Animation using Flash.	
<b>WEB 206 Technology Topic</b>	<b>5</b>
This course offers students an opportunity to independently research a technology that is determined by both the instructor and the student. Students will use the acquired skills to create a project or presentation.	
<b>WEB 290 Capstone Project</b>	<b>5</b>
This course offers students an opportunity to work on a project researching and applying skills and technologies learned. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>WEB 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>WEB 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>WEB 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>WEB 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>WEB 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	

**WEB 297 Work-based Learning Seminar** 1-2

Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meets with the students to provide support and assistance during the experience.

**WEB 298 Work-based Learning – No Seminar** 1-18

This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

CREDITS

**WELDING**

**WELD 101 Safety Principles** 2  
This course is an introduction to the safety practices and procedures common to the welding industry

**WELD 102 Fabrication Plans** 4  
Students learn to read, interpret and create graphic drawings to complete welding projects.

**WELD 103 Pre and Post-welding Activities** 2  
This course is an introduction to the tools, equipment, and materials used in the layout and fabrication of welding projects.

**WELD 104 Oxy/acetylene Cutting** 3  
This course is an introduction to the use of oxy/acetylene welding and cutting equipment.

**WELD 105 Introduction to Shielded Metal Arc Welding (SMAW)** 5  
This course is an introduction to the SMAW process with emphasis safety and theory. This class is the beginning in developing eye - hand coordination using fast fill SMAW electrodes on different groove designs and weld positions.

**WELD 106 Welding Math** 5  
Students learn and apply various math concepts to solve problems common to the welding industry. Applications include project estimates including both material and labor costs and layout and fabrication operations. Applied functions range from English/metric conversions to area and volume calculations.

**WELD 107 Torch Brazing and Soldering** 1  
Students learn to perform brazing and soldering techniques with emphasis on the changes in the process encountered at various temperatures.

**WELD 108 Full Penetration Welds – Flat/Horizontal** 5  
This course is an extension of weld 107, using more advanced welding techniques in the flat and horizontal positions.

**WELD 109 Full Penetration Welds – Vertical/Overhead** 5  
This course is an extension of weld 107, using more advanced welding techniques in the vertical and overhead positions.

**WELD 110 Full Penetration Welds – Open Root** 5  
This course is an advanced SMAW class using fast freeze electrodes in preparation for pipe welding.

CREDITS

**WELD 111 Introduction to Gas Metal Arc Welding (GMAW)** 3  
Students receive instruction on the GMAW process learning theory, safety, and equipment set up.

**WELD 112 Gas Metal Arc Welding – Full Penetration** 5  
In this course the students learn the hands-on application of the different transfer modes of GMAW on mild steel in all positions.

**WELD 113 Gas Metal Arc Welding – Aluminum** 5  
In this course the students learn the hands-on application of the different transfer modes of GMAW on aluminum in all positions.

**WELD 114 Introduction to Flux Core Arc Welding (FCAW)** 5  
Students receive instruction on the FCAW process learning theory, safety and equipment set up.

**WELD 115 Flux Core Arc Welding – Full Penetration** 5  
Students learn the hands-on application skill of FCAW in all positions, on mild steel.

**WELD 116 Carbon Arc Cutting (CAC) and Plasma Arc Cutting (PAC)** 5  
Students learn how to safely use plasma arc and carbon arc cutting techniques.

**WELD 201 Introduction to Gas Tungsten Arc Welding (GTAW)** 5  
This course is an introduction to the gas tungsten arc GTAW welding process. Topics include correct selection of tungsten, polarity, gas, and proper filler rod with emphasis placed on safety, equipment setup, and welding techniques.

**WELD 202 Gas Tungsten Arc Welding – Full Penetration** 5  
Students receive instruction on the GTAW process performing fillet and groove welds with various electrodes and filler materials on steel and stainless steel.

**WELD 203 Gas Tungsten Arc Welding – Aluminum** 5  
Students learn to perform GTAW fillet and groove welds on aluminum.

**WELD 204 Welding Certification Testing – (SMAW)** 5  
This course gives the student certification testing time in SMAW.

CREDITS



	CREDITS
<b>WELD 205 Advanced Welding Applications – Pipe/SMAW</b>	<b>5</b>
This course covers the knowledge and skills that apply to welding pipe. Topics include pipe positions, joint geometry, and preparation with emphasis placed on bead application, profile, and weld discontinuities. Students learn to perform SMAW welds to applicable codes on carbon steel pipe with prescribed electrodes in various positions.	
<b>WELD 206 Advanced Welding Applications – Pipe/GTAW</b>	<b>5</b>
This course is designed to enhance skills with the GTAW welding process. Topics include setup, joint preparation, and electrode selection with an emphasis on manipulative skills in all welding positions on pipe.	
<b>WELD 207 Welding Certification Testing – (FCAW)</b>	<b>5</b>
This course gives the student certification testing time in (FCAW	
<b>WELD 208 Non-Destructive Testing (NDT)</b>	<b>1</b>
This course is an introduction to non-destructive testing methods used to detect discontinuities to help assure standards of quality in welding. Emphasis is placed on safety, types and methods of testing, and the use of testing equipment and materials.	
<b>WELD 209 Forklift Training</b>	<b>1</b>
Students learn to operate forklifts in a safe and professional manner. Important aspects of Forklift operation including safety considerations and center of balance guidelines are emphasized.	
<b>WELD 210 Advanced Welding Applications – Project</b>	<b>5</b>
This course offers the student the opportunity to use the knowledge and skills learned in class and apply them to actual projects or in the work based learning program with no lecture.	
<b>WELD 291 Practical Applications</b>	<b>1-18</b>
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>WELD 292 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	

	CREDITS
<b>WELD 293 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>WELD 294 Independent Projects</b>	<b>1-5</b>
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.	
<b>WELD 296 Work-based Learning Experience</b>	<b>1-18</b>
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.	
<b>WELD 297 Work-based Learning Seminar</b>	<b>1-2</b>
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.	
<b>WELD 298 Work-based Learning – No Seminar</b>	<b>1-18</b>
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.	

## BASIC STUDIES COURSE DESCRIPTIONS

CREDITS

## BASIC STUDIES COURSES

For adults seeking to improve skills in reading, writing and math. The following courses prepare students for more advanced courses, to improve COMPASS scores, GED testing, and workplace and life situations.

**ABE 050 Beginning Basic Education**

ABE Level 2 course designed to teach reading, writing, and computational skills to individuals who have a goal to improve basic skills and, at intake, score 201-210 on a CASAS test.

**ABE 060 Low Intermediate Basic Education**

ABE Level 3 course designed to teach reading, writing, and computational skills to individuals who have a goal to improve basic skills and, at intake, score 211-220 on a CASAS test.

**ABE 070 High Intermediate Basic Education**

ABE Level 4 course designed to teach reading, writing, and computational skills to individuals who have a goal to improve basic skills and, at intake, score 221-235 on a CASAS test.

**BSEP 046 Basic Studies****Educational Planning-Basic Skills**

Course for adult students in all basic studies competency levels with a goal of improving literacy and/or attaining a GED as a means to gain or progress in employment. Course outcomes include assessment of current student abilities, orientation to college resources and services, readiness to learn; student's personal, educational, and employment background and interests; orientation to the GED exams, barrier identification with strategies, recommendations, and interventions, long-term and short-term goal setting, and an education plan of action.

**BSEP 070 Basic Studies****Educational Planning – Vocational**

Course for adult students in all basic studies competency levels with a goal or interest in transition to post secondary education or training. Course outcomes include assessment of current student abilities, orientation to college resources and services, readiness to learn; student's personal, educational, and employment background and interests; student's skill gaps, learning deficiencies, and difficulties; barrier identification with strategies, recommendations, and interventions for improvement; student's long-term and short-term goals; identification of the skills needed to reach those goal, and an education plan of action for the student to transition to post secondary studies

**BSEP 080 BSEP Mental Toughness**

This is a 30-Hour program consisting of skills assessment, goal setting, learning styles and strategies and barrier identification and mitigation planning to prepare students to be successful in selecting and participating in integrated GED preparation and professional technical skills training. Students may take this class only once per academic year.

**ENGL 050 Writing Development III**

Writing simple narrative descriptions and short essays on familiar topics such as customs in native country, has consistent use of basic punctuation, but makes grammatical errors with complex structures. Core Competency Level 3.

**ENGL 070 High Intermediate Basic Writing**

ABE Level 4 course designed to teach writing skills to individuals who have a goal to improve basic skills and, at intake, score 221-235 on a CASAS test.

**ENGL 080 GED Writing**

Basic GED preparation writing course for students with a goal of earning the General Educational Development (GED) equivalency certificate who, at intake, score 236 or higher on a CASAS test.

**ESL 057 Low Beginning ESL Listening and Speaking**

ESL Level 2 courses in listening and speaking for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 181-190 on a CASAS test.

**ESL 058 Low Beginning ESL Reading and Writing**

ESL Level 2 course in reading, and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 181-190 on a CASAS test.

CREDITS

**ESL 067 High Beginning ESL Listening and Speaking**

ESL Level 3 course in listening and speaking for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 191-200 on a CASAS test.

**ESL 068 High Beginning ESL Reading and Writing**

ESL Level 3 course in reading and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 191-200 on a CASAS test.

**ESL 077 Low Intermediate ESL Listening and Speaking**

ESL Level 4 course in listening and speaking for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 201-210 on a CASAS test.

**ESL 078 Low Intermediate ESL Reading and Writing**

ESL Level 4 course in reading and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 201-210 on a CASAS test.

**ESL 081 ESL - Success Strategies**

Students learn applied techniques for increasing personal effectiveness and productivity through goal setting, self-reflection, self-evaluation, and positive interactions. This course provides a basis for success in the community and workplace environments by incorporating cultural awareness and adjustment skills.

**ESL 087 High Intermediate ESL Listening and Speaking**

ESL Level 5 course in listening and speaking for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 211-220 on a CASAS test.

**ESL 088 High Intermediate ESL Reading and Writing**

ESL Level 5 course in reading and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 211-220 on a CASAS test.

**ESL 089 Low Advanced ESL**

ESL Level 6 course in listening, speaking, reading, and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 221-235 on a CASAS test.

**GED 080 GED Test Preparation**

Basic GED preparation course for students with a goal of earning the General Educational Development (GED) equivalency certificate who, at intake, score 236 or higher on a CASAS test.

CREDITS

**ADULT BASIC EDUCATION (ABE)**

Adult Basic Education (ABE) classes help students who may or may not have a high school diploma, improve mathematics, reading and writing skills.

Students enroll in adult basic education to prepare for further general education courses, to complement career education, to prepare for General Education Development (GED) testing, and for personal improvement.

Students take assessment tests and are then placed in appropriate classes for their skill level and personal educational goals. [See page 10.]

## BASIC STUDIES COURSE DESCRIPTIONS

	CREDITS	CREDITS
<p><b>MATH 060 Low Intermediate Basic Math</b> ABE Level 3 course designed to teach computational skills to individuals who have a goal to improve basic skills and, at intake, score 211-220 on a CASAS test.</p>		
<p><b>MATH 070 High Intermediate Basic Math</b> ABE Level 4 course designed to teach computational skills to individuals who have a goal to improve basic skills and, at intake, score 221-235 on a CASAS test.</p>		
<p><b>MATH 080 GED Math Preparation</b> Basic GED preparation math course for students with a goal of earning the General Educational Development (GED) equivalency certificate who, at intake, score 236 or higher on a CASAS test.</p>		
<p><b>MATH 086 Pre-Algebra I</b> Basic mathematical and computational concepts for students with a vocational education goal who, at intake, score 236-244 on a CASAS test. Text: Martin-Gay, PreAlgebra, 5th Edition</p>		
<p><b>MATH 087 Pre-Algebra II</b> Basic mathematical and computational concepts for students with a vocational education goal who at intake score 245 or higher on a CASAS test. Text: Martin-Gay, PreAlgebra, 5th Edition</p>		
<p><b>READ 050 Beginning Basic Education Reading</b> ABE Level 2 course designed to teach reading to individuals who have a goal to improve basic skills and, at intake, score 201-210 on a CASAS test.</p>		
<p><b>READ 060 Low intermediate Basic Reading</b> ABE Level 3 course designed to teach reading to individuals who have a goal to improve basic skills and, at intake, score 211-220 on a CASAS test</p>		
<p><b>READ 070 High intermediate Basic Reading</b> ABE Level 4 reading course designed to teach reading to individuals who have a goal to improve basic skills and, at intake, score 221-235 on a CASAS test.</p>		
<p><b>READ 073 Reading Development IV .5cu</b> Evaluating, comprehending and making inferences from a variety of reading materials including textbooks, technical manuals and works of fiction. High school student placement is after the completion of Basic Studies Educational Planning (BSEP).</p>		
<p><b>READ 080 GED Reading</b> Basic GED preparation reading course for students with a goal of earning the General Educational Development (GED) equivalency certificate who, at intake, score 236 or higher on a CASAS test.</p>		
<p><b>READ 089 Transitional Reading</b> Reading skills course for students with a vocational education goal who, at intake, score 236 or higher on a CASAS Reading test. Students progress to READ 090, WRIT 085, ENGL 090 or ENGL 091 based upon instructor recommendation.</p>		<p><b>WRIT 085 Writing Transition Lab I</b> Competency based small cohort writing instruction for students with CASAS scores 221-259 at entry as an alternative contextual pathway to prepare students for enrollment and success in a specified related instruction course required for a specific professional technical credential. This course may be continued for multiple quarters</p>

## HIGH SCHOOL COURSE DESCRIPTIONS

\* CU = Carnegie Units

## HIGH SCHOOL COURSES

## ART

**ART 091 Appreciation Public Art .5cu\***

Understanding and appreciating public art, past and present. Students trace the heritage of the public art form from cave paintings to modern works in Tacoma. Students address the ideas behind public art and the issues around the vision for public art and the governmental processes by which it is designed, approved and installed.

**Art 092 History of Modern Art .5cu**

The study of the history of the development of modern art, beginning with the 19th Century and concluding with an emphasis on contemporary art and architecture. Students critically examine and assess the esthetics of art styles and ideologies.

**ART 093 Performance Art .5cu**

Students demonstrate thinking skills during the process to develop and perform an artistic work(s) for others.

**ART 094 Color and Design .5cu**

Students practice drawing, painting, and sketching skills with various media, and are introduced the elements of classic and modern design.

**ART 095 Visual Arts Portfolio .5cu**

Students demonstrate the ability to apply arts concepts through creation of a visual arts portfolio in one or more arts genre.

**Art 097 Three Dimensional Design .5cu**

Students focus on gaining skills to create 3-dimensional works of art. Students design and construct projects exploring linear, planar, and solid forms through the use of wire, cardboard, wood, and wax.

## ENGLISH

**ENGH 092 COE English .5cu**

High School English course that specifically prepares students for completing an alternative assessment to WA State HS Reading and Writing graduation exams.

**ENGH 093 Senior Culminating Project .5cu**

Students attend a series of workshops and complete either a technical or community service project, work with a mentor in school or in the community, develop a personal portfolio of work, write a paper reflecting on their learning and present a multi-media presentation to a community or peer panel.

**ENGH 096 American Literature & Composition .5cu**

The study of a variety of American Literature short stories and novels. Students examine the of the elements of theme, plot, character, setting, point of view, and tone and use a computer to complete online reading and writing assignments.

CREDITS

## HEALTH &amp; PHYSICAL EDUCATION

**HLTH 091 Nutrition and Fitness I .5cu**

Nutrition and fitness play a crucial role in maintaining a healthy lifestyle. Study the fundamentals and roles of nutrition and participation in fitness activities. (13 hours lecture; 37 hours lab) Instructor will specify schedule of required lectures.

**HLTH 093 Fitness II .5cu**

Learn the importance of establishing individualized fitness goals and safety through classroom presentations and participation in fitness activities. (5 hours lecture; 45 hours lab) Instructor will specify schedule of required lectures.

**HLTH 095 Health I .5cu**

Acquire knowledge and skills necessary to maintain a healthy life and evaluate the impact of real-life influences on health.

## HISTORY/SOCIAL STUDIES

**GEOG 093 World Geography .5cu**

Survey of world geography and its interrelationship with specific areas. Classes are presented in seminar format with lecture and discussion. Students conduct library research to complete an individual research project relating to the world's physical and political geography.

**GLOB 095 Current Global Issues .5cu**

The study of world history, geography and current events, intertwined to show links between past and present with particular attention to current events.

**GOVT 095 Civics .5cu**

A study on how local, state and federal governments work. Extensive study of the U.S. Constitution. The development of the nation from colonization through the Civil War. Explores the American Revolution, formation of the U.S. Constitution, consolidation of the states, early economic growth, slavery, westward expansion and other causes of the Civil War.

**HIST 090 US History I .5cu**

History of the political, social, economic and cultural development of the United States from the events that led to the Revolutionary War to the US Civil War.

**HIST 092 US History II .5cu**

A study of the development of the United States from Reconstruction through present times. Covers the industrial era, Indian affairs, populism, progressivism, various wars, civil rights, the Cold War and its end.

**HIST 095 Film History .5cu**

A study of social and cultural themes as presented through historic and modern cinema.

CREDITS

**HIST 096 Washington State History .5cu****HIST 096OL Washington State History (Online)**

History of the Pacific Northwest, with emphasis on the political and economic development of Washington state.

**HIST 098 Scientific Revolution + Modern America .5cu**

A laboratory hands-on history of the development of knowledge through science and applied technology, and the impact of science and technology on the growth and development of modern America.

## MATHEMATICS

**MTTH 086 HS Pre-Algebra I .5cu**

Introduction to pre-algebra mathematical and computational concepts for high school students, who at intake score 236-244 on CASAS Test.

**MTTH 087 HS Pre-Algebra II .5cu**

Introduction to pre-algebra mathematical and computational concepts for high school students, who at intake score 245 or higher on CASAS test or have completed MTTH 086.

**MTTH 091 HS Algebra I .5cu**

High School Algebra course that specifically prepares students for the WA State HS mathematics graduation exam.

## SCIENCE

**HSCI 093 Molecules to Organisms .5cu**

Students delve into the interactions of molecules and their roles in organismal processes; a particular focus is on human body systems. This course may also be used as a HS health credit.

**HSCI 095 Heredity .5cu**

The study of chromosomes, traits, cellular meiosis and mutations and the variation and change in organisms and populations over time.

**HSCI 096 Biological Evolution .5cu**

The study of the changes in the genetic makeup of populations of organisms over time. This is a lab science course.

**HSCI 098 Ecology .5cu**

The study of the interactions between living organisms and their environment. This is a lab science course.

**SCI 094 Introduction to Physics .5cu**

Application of physics in everyday life with emphasis on the conceptual understanding of the underlying principles of motion, friction, gravity, energy, fluids, electricity, and magnetic fields.

CREDITS

## GENERAL EDUCATION (ACADEMICS) COURSE DESCRIPTIONS

**SCI 098 Atmospheric Science .5cu**  
 The application of the science of meteorology for commercial and industrial uses, including meteorological codes used in weather observing and forecasting; types and applications of weather satellite pictures; impact of severe weather (floods, high winds, tornadoes, hurricanes, etc.) on life and the economy; presentation of weather for the media; types and formations of clouds; interpretation of weather radar data; analysis of weather charts; and a practical weather forecasting lab. Elements of the sciences of geography, oceanography, topography, and climatology will be incorporated.

## GENERAL EDUCATION (ACADEMICS) COURSES

## ART

**ART& 100 Art Appreciation (WAOL) 5**  
 Prerequisite: ENGL 091

Introduction to the diversity of the art world from ancient civilizations to contemporary society. Art terminology and methods are covered in an overview of artists' materials and techniques. Virtual online access available one week prior to the class start date.

## BIOLOGY

**BIOL& 160 General Biology 5**  
 Prerequisite: MATH 098

General Biology is intended to leave the student with an integrated view of the living world. The primary goal of this course is to provide students with exposure to and an appreciation of basic cellular, molecular, genetic, evolutionary, and ecological processes that will assist them in future advanced courses and/or in self-directed study of relevant biology and biotechnology issues. Course learning involves lectures and labs.

**BIOL 170 Medical Terminology–Basic 1**  
 Prerequisite: ENGL 091

This course teaches students the basic design of medical terminology and provides a foundation of knowledge for the language of medicine used in allied health fields.

**BIOL 171 Human Anatomy and Physiology 4**  
 In depth study of human body systems emphasizing the relationship between structure and functions as an introductory course for students beginning study in health sciences and related fields. Includes laboratory activities.

**BIOL 175 Human Biology 5**  
 An in- depth study of human body systems emphasizing the relationship between structure and functions. A laboratory course appropriate for students beginning study in health sciences and related programs.

CREDITS

**BIOL& 241 Anatomy & Physiology I 5**  
 Prerequisites: BIOL&160 and CHEM&121.

This is the first class in a two-quarter sequence in which human anatomy and physiology are studied using a body systems approach with emphasis on the interrelationships between form and function at the gross and microscopic levels of organization. Topics include orientation to the human body, cells, tissues, and the following body systems: integument, skeletal, muscle and digestive. *How the body works* is covered in enough detail that students could explain concepts to others and apply knowledge to novel situations (e.g. make informed decisions regarding their own health and the health of those whom they care about). Some memorization of anatomical structures is required but most of the course focuses on learning for understanding and assessments reflect this emphasis. Lecture and lab exercises cover fundamental principles and establish a basis for advanced study of anatomy and physiology and clinically related subjects in the paramedical fields.

**BIOL& 242 Anatomy & Physiology II 5**  
 Prerequisite: BIOL&241

This is the second in a two-quarter sequence in which human anatomy and physiology are studied using a body systems approach with emphasis on the interrelationships between form and function at the gross and microscopic levels of organization. Topics include the following body systems: nervous, endocrine, cardiovascular, lymphatic, respiratory, urinary and reproductive. *How the body works* is covered in enough detail that students could explain concepts to others and apply knowledge to novel situations (e.g. make informed decisions regarding their own health and the health of those whom they care about). Some memorization of anatomical structures is required but most of the course focuses on learning for understanding and assessments reflect this emphasis. Lecture and lab exercises cover fundamental principles and establish a basis for advanced study of anatomy and physiology and clinically related subjects in the paramedical fields.

**BIOL& 260 Microbiology 5**  
 Prerequisite: MATH 098

Study of microbe structure and classification, organelle function, cellular processes and biochemical reactions, culture requirements and use by humans. In the lab, students learn proper aseptic technique, maintenance of stock bacterial cultures, staining techniques and the use of biochemical tests to identify bacterial unknowns.

**NUTR& 101 Intro to Nutrition 5**  
 Prerequisite: MATH 098

Study of human nutrition and health. Topics include digestion, absorption and processing nutrients in the body; chemistry and functions of the major nutrients: carbohydrates, fat, protein; vitamin and mineral functions; food, culture and diet, energy balance, diet and metabolism; fitness and health; nutrition of the life cycle, food safety and local and world hunger issues.

CREDITS

## BUSINESS

**BA 217 Business Communications (WAOL) 5**

Prerequisite: ENGL 091

Basic writing skills for business applications including grammar, punctuation, spelling and vocabulary with emphasis on business terminology and usage. Practice skills by writing e-mails, memoranda, various kinds of business letters, and a to-file report. Virtual online access available one week prior to the class start date.

## CHEMISTRY

**CHEM& 110 Chemical concepts w/Lab 5**

An introduction to the fundamental principles of chemistry and the predictive power chemistry provides. Topics include elements, compounds, and mixtures; periodic properties of the elements; atomic theory and structure; molecular structure and chemical bonding; chemical notation and nomenclature; mass and molar relations; chemical reactions and the mass and energy changes accompanying them; simple thermodynamics; equilibrium, equilibrium constants and kinetics; properties of gases, liquids, solids, and solutions; properties of acids, bases, and pH; connections between chemistry and daily life. (This course is generally transferable and meets general education requirements for a laboratory science course in an AAS-T degree. [This is an adopted WAOL shared course; start date will be determined by WAOL which may be different than the start of the Bates quarter.]

**CHEM& 121 Introduction to Chemistry 5**  
 Prerequisite: MATH 098

Students in this course explore the structure of matter and how it behaves under various conditions in order to better understand the chemical world. Designed for students with little or no chemistry background, laboratory activities extend lecture concepts and introduce students to the experimental process.

**CHEM& 131 Organic Chemistry 5**  
 Prerequisite: CHEM&121

Introduction to organic chemistry and biochemistry includes study of the nomenclature, structure, reactions and synthesis of organic compounds and biochemistry applications in nursing field. Structure and properties of the major classes of organic compounds with particular reference to organic molecules and their relationship to polymers, such as carbohydrates, lipids, proteins, and nucleic acids. Course is primarily intended for those who are interested in the application of the principles of organic chemistry and biochemistry to related areas of science such as genetics, microbiology, physiology, and nutrition. Course learning involves lectures and labs.

CREDITS

## General Education Course Descriptions

## QTS = Qualifying Test Scores

CREDITS

## COMMUNICATIONS

## ASL&amp; 121 American Sign Language I 5

An interactive telecourse with VHS tapes exchanged between instructor and student. Includes a brief history of ASL, its development, grammatical principles, and vocabulary rules. Vocabulary, finger spelling and sentence structure are developed.

## CMST&amp; 102 Introduction to Mass Media 5

This course critically examines core issues in the relationship between media and society, including news and entertainment media in print, electronic, and digital format. Through readings, viewings, research, and discussion, we examine the historical, cultural, political, and economic contexts of media industries, representations, and audiences.

This course fulfills the college requirement for Communication/English here at Bates Technical College while offering generally transferable credits. It requires a reading- and writing-intensive experience that encourages critical thought and real-life application. It is critical that students commit to attending every single class session.

## CMST&amp; 152 Intercultural Communications 5

We live in an era of rapid globalization in which being able to communicate across cultures is imperative in our ability to function in a diverse workplace, city, and world. In this course, students will work towards developing intercultural communication competence. This will be accomplished through classroom exercises, discussions and projects aimed at increasing our sensitivity to other cultures as well as our own cultural backgrounds, and the contexts (social, cultural and historical) in which we live and communicate.

## CMST&amp; 210 Interpersonal Communications 5

Prerequisite: ENGL 091

Explores human relations including interpersonal communication effectiveness, giving and receiving criticism non-defensively, building empathy, listening effectively, improving nonverbal awareness, and interviewing successfully.

## CMST&amp; 220 Public Speaking 5

Prerequisite: ENGL 091

Introduction to the rhetoric of speech and the preparation and delivery of speech in an extemporaneous style, including ethical research methods, basic rhetoric and critical analysis, and organization of various types of presentations. Two to four speaking assignments are required, plus regular quizzes, peer review, and written examination. Online resources will be integrated.

## CMST&amp; 230 Small Group Communications 5

Prerequisite: ENGL 091

Explores human relations including team leadership, conflict management, team dynamics, decision-making, problem solving, and assertiveness strategies. Apply concepts by working in a variety of self-directed problem-solving groups.

## ENGLISH

## EIS 081 Intensive Grammar I/S 5

For intermediate students of English as a second or foreign language with an emphasis on practical usage and application to prepare students for further developmental general education courses.

## EIS 083 Intensive Reading &amp; Writing for International Students 5

An intermediate ESL expository written communication course emphasizing critical thought, reflective reading, and information literacy, with attention to grammar and conventions of standard American English.

## EIS 085 Intensive Oral/Aural Skills for International Students 5

Oral and aural abilities emphasizing peer review discussions, notetaking, lecture comprehension and presentation skills to prepare students for further career education or developmental general education courses.

## EIS 091 Grammar International Students 5

Prerequisite: EIS 081

For advanced students of English as a second or foreign language with an emphasis on practical usage and application.

## EIS 093 Reading and Writing for International Students 5

Prerequisite: EIS 083

An expository written communication course emphasizing critical thought, reflective reading, and information literacy, with attention to grammar and conventions of standard American English.

## EIS 095 Oral/Aural for International Students 5

Prerequisite: EIS 085

Oral and aural abilities designed to prepare students for college-level English courses emphasizing peer review discussions, notetaking, lecture comprehension and presentation skills.

## ENGL 090 Writing for College 5

Prerequisite: QTS

Critical thinking and composition skills; writing connected paragraphs using correct punctuation, capitalization, usage, spelling, and complex sentence structures.

CREDITS

## ENGL 091 Integrated Reading &amp; Writing II 5

Prerequisite: ENGL 090

Competency-based communications course to prepare students for college-level general education. Refinement of reading and critical thinking abilities and development of writing skills for specific purposes and audiences.

## ENGL 099 Workplace Communications 5

Prerequisite: AIPS 081 or ENGL 089

Reading, writing and research assignments pertaining to career education program workplace issues. Students use reading and research skills and complete oral and written communications competency. Sections of this course may be restricted to students in a specific cluster of career education programs. This course satisfies the general education communications requirement for a certificate of competency.

## ENGL&amp; 101 English Composition I 5

Prerequisite: ENGL 091

An expository written communication course emphasizing critical thought, reflective reading, and information literacy, with attention to rules and conventions of standard American English.

## ENGL&amp; 102 Composition II X

Students study literature and literary criticism in order to develop critical thinking, reading and writing skills beyond the level achieved in English 101, emphasizing logical reasoning, analysis, and strategies of argumentation.

## ENGL 175 Professional Writing 5

Enables students in career training programs to think logically and clearly and be effective and convincing in their professional and technical writing. It focuses on development of communications skills essential in a variety of forms of professional and technical writing. Prerequisites: Completion of ENGL 090 or COMPASS Reading 84 and Writing 76 higher.

## GENERAL EDUCATION COURSES

General education (academic) courses are designed to provide competence in a variety of learning areas related to career education, and to ensure that all students have a broad, basic education. Areas of study include human relations/leadership, communications and mathematics.

General education courses are required as part of degree and certificate achievement, and are necessary for pursuit of higher-level degrees. (See page 12.)

## General Education Course Descriptions

## QTS = Qualifying Test Scores CREDITS

**ENGL& 235 Technical Writing** 5  
Prerequisite: ENGL& 101  
Advanced written communication for technical and business purposes based on higher level researching of technical information, organizing data, and writing abstracts, studies and detailed business communications. Requires a formal report using prescribed guidelines, including front and back matter.

## HISTORY

**HIST 101 History of Science and Technology** 5

Prerequisite: ENGL 089  
Traces the development of western science technology, examines the roles of philosophers, the church, universities, and scientists. Students become aware of the emergence and expanded role of knowledge seeking that occurred as civilizations expanded and became more complex. Focus is on the contributions of common artisans and craftsmen/women whose activities led to important discoveries that became the basis for numerous scientific theories and technological advancements.

## HUMAN RELATIONS

**HREL 093 Success Strategies - ELL** 5  
Applied techniques for increasing personal effectiveness and productivity through goal setting, self-reflection, and positive interactions. Provides a basis for success in educational and workplace environments by incorporating cultural awareness and adjustment skills. Credits may be applied toward meeting certificate of competency human relations requirements.

**HREL 111 Emp. Interviewing/ Self Promotion** 5

Prerequisite: ENGL 089  
Students are introduced to the principles of communication in the context of successfully interviewing for a job, learning self-promotion with effective reasoning and evidence, to prepare for interviews, to maximize a positive impression through nonverbal communication, the value of building personal credibility, and how to leave a lasting positive impression. Students practice learned skills by participating in interview situations where their performance is critiqued by classmates and the instructor.

## MATHEMATICS

**AMATH 090 Pre-college Engineering Mathematics** 5

This course is a modular web-enhanced progression of mathematical concepts and computation: skills required for success in engineering technology fields of study. Math concepts are taught using a STEM field contextual basis. This course is linked to AMATH 170 in a joint delivery sequence. Students will be promoted to and receive credit for AMATH 170 if they achieve the competency outcomes for the higher course. Successful completion of this course meets the prerequisite for enrolling in AMATH 170 in a subsequent quarter.

**AMATH 170 Engineering Foundational Mathematics** 5

This course is a modular web-enhanced progression of foundational mathematical concepts and computation: skills required for success in engineering technology fields of study. Math concepts are taught using a STEM field contextual basis. Successful completion of this course is equivalent to completion of intermediate algebra and meets the prerequisite for math courses requiring a MATH 098 prerequisite. PREREQUISITE: MATH 087 or qualifying Compass or CASAS scores equivalent to MATH 092.

**MATH 092 Elementary Algebra** 5

Prerequisites: Math 087 or QTS  
Review of numerical relationship; introduction to elementary algebra concepts, including real numbers, exponents, the order of operations, algebraic expressions, solving algebraic equations, formulas, problem solving, graphing linear equations, rates of change, slopes of lines, functions, scientific notation, and polynomial functions.

**MATH 096 Business Math II** 5

Prerequisite: MATH 093 or QTS  
Advanced business math topics: compound interest, future and present value, annuities and sinking funds, consumer credit, depreciation, inventory and overhead, financial statements, insurance premiums, taxes, stocks and bonds, and a review of algebra.

**MATH 098 Intermediate Algebra** 5

Prerequisite: MATH 092 or QTS  
Variables, equations, formulas, algebraic expressions, polynomials, exponents, roots, factoring, quadratic equations, algebraic fractions, graphing of linear and quadratic equations, problem solving, and practical exercises using the scientific calculator.

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**MATH& 141 Pre-calculus I** 5

Prerequisite: MATH 098 or QTS  
Functions, function operations, rational, polynomial, exponential, logarithmic and linear functions and equation solving, function graphs, matrices and determinants, sequences and series.

**MATH& 142 EH Pre-calculus II** 5

Prerequisite: MATH 098 or QTS  
Right and oblique triangle trigonometry, circular functions, graphs of trigonometric functions, identities, inverse trig functions, vectors and polar coordinates, and parametric equations. TI83 Graphing Calculator required.

**MATH& 146 Intro to Stats** 5

Prerequisites: MATH 098 or MATH 174 or QTS  
Counting rules, probability, mean and standard deviation, graphing, confidence intervals, hypothesis testing and regression analysis. Application in business and technology.

**MATH& 151 Calculus I (SG/IS)** 5

Prerequisite: MATH& 141 and MATH& 142 or QTS  
Limits and limit laws, continuity, tangents and rates of change, derivatives using definition and differentiation rules for polynomial, exponential, trigonometric, logarithmic and transcendental functions, max/min problems, L'Hospital's rule, Newton's method and antidifferentiation.

**MATH 171 Technical Mathematics** 5

Application of linear and quadratic equations, systems of equations, geometry and trigonometry, and vectors and their applications in the technical workplace. Prerequisites: MATH 092 with a grade of 2.0 or higher or COMPASS algebra score of 55. TI83 graphing calculator required. This is an applied course applicable to specific AT degrees and certificates of competency. It is not generally transferable.

**MATH 172 Applied Math Business Focus** 5

Prerequisite: MATH 096 or 098 or QTS  
Equation solving, exponents, markup, income tax, compound interest, logarithms and finding time, annuities, amortization and business statistics.

## ADULT HIGH SCHOOL COMPLETION

Students 18 years of age and older may earn a high school diploma at Bates Technical College by completing high school general education courses, continuing education courses, career education programs, and by receiving credit for work-based and community learning experiences. (See page 11.)

## CREDITS

**MATH 173 Mathematic Concepts** 5  
**Child Care/Early Education**

Prerequisite: MATH 098 or QTS

The conceptual understanding, connections between and the application of math concepts, including number systems and computation, geometry, measurement, data analysis, probability and statistics, and problem solving in ways appropriate for young children.

**MATH 174 Math for Allied Health** 3

Prerequisites: Completion of Elementary Algebra (MATH 092) with a 2.0 or better or COMPASS Algebra score of 35 or higher. Mathematical concepts for allied health fields including systems of measurement, use of formulas, ratios and proportions in health applications; and basic statistics

**PSYCHOLOGY****PSYC& 100 General Psychology** 5

Prerequisite: ENGL 091

Introductory psychology for people with an interest in all that influences human behavior. Whether planning a career in psychology or gaining insights about yourself and others, you will find this a useful and interesting open enrollment course of study.

**PSYCH& 200 Lifespan Psychology** 5

This course is an introduction to the various stages of human development. Emphasis is on the major theories and perspectives and their relationship to the physical, cognitive, and psychosocial aspects of development across the life span. This course fulfills basic requirements in human development for psychology, nursing, and other related occupations.

**SOCIOLOGY****SOC& 101 Introduction to Sociology** 5  
**(WAOL)**

Prerequisite: ENGL 091

Study of social groups and their structures, processes, institutions, and interactions. Understanding and applying the sociological perspective, stressing the importance of the impact of social forces external to the individual in shaping people's lives and experiences. Virtual online access available one week prior to class start date.

**SOC 111 Understanding Diversity** 5

Differences and similarities between diverse groups and individuals in our multicultural society and among children, youth, and families. By observing the dynamics of diversity in real life settings, students focus on understanding how cultural differences affect how people interact and communicate and the importance of respecting cultural differences.

## CREDITS

## CREDITS