Lower Columbia College
Articulable CTE Dual Credit Classes and Outcomes Resource Guide

Accounting – ACCT 101, 135, 150, 241, 244, 275, 201, 202, 203

Allied Health – AH 114: Healthcare Communications Skills

Automotive Technology – AMTC 100, 104, 105, 114, 124, 206, 207, 214

Blueprint – BLPT 150, 160

Business Technology – BTEC 104, 111, 112, 120, 130, 131, 135, 145, 146, 148, 161, 162, 163, 164, 165, 171, 172, 173, 181, 182, 260

Business – BUS 100, 104, 119, 144, 150, 165, 240, 244, 245, 259, 264, 270 and BUS& 101, BUS& 201

Chemical Dependency Studies – CDS 105, CDS 108

Criminal Justice – CJ 154, 180, 184, 260 and CJ& 101, CJ& 106, CJ& 110

Computer Science – CS 110, CS 170

Diesel/Heavy Equipment Technology – DHET 100, 104, 105

Early Childhood Education – ECED& 105, 107, 120, 160, 170, 180, 190

Economics – ECON 105, ECON& 201

Education – EDUC 150, EDUC& 205

English – ENGL 110: Industrial Communications, ENGL 235: Technical Writing

Engineering – ENGR& 121, 122, 123, ENGR 106: Engineering Problems

Health – HLTH 100, 105, 106

Information Technology – IT 100, 102, 111, 140, 141, 142, 230

Machine Shop – MASP 107, 111, 112, 113

Math – Math 105: Math for Health Sciences; Math 106: Industrial Math;

Medical Assisting – MEDA 101, 102, 120, 122

Manufacturing – MFG 105, 120, 130, 140, 230; PMFG 110, 150, 151, 154, 201, 202, 210

Technology – TECH 100: Advanced Principles of Technology

Welding – WELD 125, WELD 131, WELD 132, WELD 158

CTE Dual Credit Pathways available at LCC:

Automotive Technology
Diesel Technology
Healthcare
Nursing
Criminal Justice
Early Childhood Education
Machine Trades
Welding

ACCT 101 Intro to Accounting Concepts 5 Credits	● Compare and contrast the three major types of business entities. ● State the accounting equation and describe how it is affected by business transactions. ● Classify typical accounts, distinguish permanent from temporary accounts, and determine the normal balance of accounts. ● Demonstrate and describe all of the steps in the accounting cycle. ● Identify the components of the income statement, statement of owner's equity, and the balance sheet. ● Explain the relationships between control accounts, subsidiary accounts, and the general ledger. ● Reconcile a bank statement and record the associated entries. ● Describe internal control procedures for cash. ● Work effectively in a collaborative environment to arrive at solutions to problems.
ACCT 135: Accounting for Non-accountants 5 Credits	● Explain how transactions affect the accounting equation ● Describe the steps in the accounting cycle ● Prepare a simple income statement, retained earnings statement and balance sheet ● Describe the fundamental internal control principles ● Calculate and interpret common financial ratios ● Perform a break-even analysis for single and multiple products ● Prepare a master budget ● Employ common capital budgeting techniques
ACCT 150: Payroll Accting/Bus Tax Reporting 5 Credits	● Given employee earnings information and appropriate tax tables, students will be able to: ● Complete a payroll register including calculation of gross pay, calculation of deductions such as FICA, FIT, etc., and calculation of net pay. ● Complete federal and state payroll tax reports. ● Given a company's revenue information, students shall: ● Complete city and state excise tax reports.
ACCT 241: Intro to QuickBooks 5 Credits	● Explain the relationship between the chart of accounts and its electronic representation. ● Enter transactions into the general journal, including end-of-period adjustments. ● Enter data into subsidiary accounting functions such as inventory, payroll, accounts receivable and payable, and fixed assets. ● Create, maintain, store, and protect electronic account data. ● Create and interpret financial statements and reports. ● Solve problems by determining corrective actions to take when given incomplete, inaccurate, or misleading source documents. ● Describe basic computer operations such as data backup and printing.
ACCT 244: Individual Income Taxation 5 Credits	● Describe the purpose and the sources of federal tax law ● Distinguish progressive, proportional, and regressive the tax structures ● Differentiate between items included and excluded from gross income ● Describe differences between tax deductions and tax credits ● Identify similarities and differences of financial accounting and income tax accounting ● Prepare tax schedules associated with a Form 1040 including required calculations ● Distinguish ordinary gains and losses from capital gains and losses ● Explain how to exclude the gain on the sale of a personal primary residence

	● Develop an appreciation of the economic, political, and social impact of federal income taxation
ACCT 275: Accounting Tech Capstone 5 Credits	● Perform the accounting cycle steps manually ● Prepare end of period adjusting entries for cash basis entries ● Prepare financial statements ● Create a company and perform account maintenance in QuickBooks ● Describe the impact of QuickBooks transactions on the financial statements ● Perform employee payroll calculations, withholdings, and payroll taxes ● Complete payroll tax forms ● Prepare payroll transactions ● Describe the internal controls necessary to protect company assets and ensure accounting accuracy.
ACCT& 201 Principles of Accounting I 5 Credits	● Identify the qualitative characteristics of financial reporting and apply the basic assumptions, principles, and conventions underlying generally accepted accounting principles. ● Explain the differences between corporations, partnerships, and proprietorships. ● Classify accounts into the appropriate categories: asset, liability, stockholders' equity, revenue, or expense. ● Distinguish permanent from temporary accounts, and determine the normal balance of accounts. ● State the steps in the accounting cycle and apply the accounting cycle to service firms including: journalizing, posting, adjusting entries, financial statements, closing entries, and reversing entries. ● Distinguish between accrual accounting and cash basis accounting. ● Demonstrate the accounting for simple merchandising transactions. ● Distinguish between cash, cash equivalents, and short-term investments and explain accounting principles for each. ● Perform the calculations to determine losses for uncollectible accounts under the allowance method. ● Calculate interest, maturity value, and the maturity date of short-term notes receivable. ● Distinguish between inventory systems, costing methods, and valuation. ● Determine the cost of inventory under various cost flow assumptions.
ACCT& 202: Principles of Accounting II 5 Credits	● Identify the major types of current liabilities and describe the accounting treatment for each. ● Describe the major characteristics of corporate bonds and apply the time value of money concepts to determine bond issue prices. ● Identify the acquisition costs of long-term assets, demonstrate methods of depreciating these assets, and describe how to account for the sale or disposal of long-term assets. ● Explain the accounts and concepts associated with the stockholders' equity section of a corporate balance sheet. ● Discuss the classification of cash flows and the types of inflows and outflows associated with each of the classifications. ● Describe the major characteristics of corporations and explain the effects of stock transactions on the accounting equation.
ACCT& 203: Principles of Accounting III 5 Credits	● Demonstrate how costs flow through a manufacturing firm. ● Describe the differences between job costing and process costing. ● Compare Activity Based Costing (ABC) with traditional costing systems.

	● Explain the differences between absorption and variable costing. ● Prepare the major components of a master budget. ● Explain how various costs behave and why knowledge of cost behavior is important in business. ● Apply the concepts of cost/volume/profit analysis as it relates to cost behavior. ● Employ time value of money concepts to solve capital budgeting problems. ● Discuss the differences between managerial and financial accounting. ● Describe the relationship between budgets and performance measurement. ● Utilize spreadsheets to solve business problems and present information.
AH 114 Healthcare Communication Skills 2 Credits	● Describe components of verbal and nonverbal communication ● Identify therapeutic and non-therapeutic responses in health care communication. ● Discuss blocks to therapeutic communication. ● Identify characteristics of effective verbal and written reporting in health care settings. ● Explain principles for documentation in health care settings. ● Discuss communication strategies for complex health care situations. ● Explain strategies for effective teamwork within health care organizatior ● Discuss strategies for conflict management in health care employment settings. ● Explore the use of computer technology in health care. ● Analyze the impact of cultural and philosophical beliefs on health care practices and communication. ● Explore methods for acquiring employment in health care settings. ● Identify characteristics of credible websites.
AMTC 100 Essentials of Mechanics 5 Credits	● Relate industrial safety practices to various mechanical jobs. ● Apply knowledge of basic skills relative to further study in the automotive or diesel programs. ● Demonstrate a mastery of basic machine, tool, and material processes in the mechanical industries. ● Apply educational skills of communication, problem solving, and computation as they relate to industry. ● Be acquainted with industrial work procedures as applied to identified tasks. ● Use appropriate hand tools, portable power tools, measuring and testing equipment, and power machinery. ● Access and utilize technical reference manuals, specification charts, trade journals, and computerized repair data. ● Possess technical skills and knowledge needed for advanced training in the automotive or diesel program. ● Develop teamwork skills in solving problems using inductive and deductive thought.
AMTC 104 Automotive Electrical Systems 5 to 15 credits	● Apply Ohm's Law to understand the electrical principles ● Interpret wiring diagrams ● Identify electrical circuit components ● Test electrical components to determine needed repairs ● Diagnose general electrical systems ● Diagnose and service a battery ● Diagnose and repair starting system ● Diagnose and repair lighting system

	● Diagnose and repair driver information system ● Diagnose and repair power accessories ● Diagnose and repair computer circuits
AMTC 105 Vehicle Climate Control 5 Credits	● Use safety procedures necessary for working with (HVAC) systems ● Explain the principles of heat movement within (HVAC) systems ● Explain the operation of (HVAC) components ● Properly use diagnostic equipment ● Use refrigerant recovery equipment effectively ● Identify systems which use various types of refrigerants
AMTC 114 Automotive Chassis 5 to 15 credits	● Diagnose and perform brake jobs on all brake systems ● Diagnose brake noise ● Identify ABS system type ● Determine if a malfunction has occurred ● Determine if malfunction is anti-lock or TCS system ● Retrieve stored trouble codes ● Determine method of diagnosis ● Diagnose and repair suspension problems. ● Perform alignments ● Diagnose wheel and tire problems ● Demonstrate proper safety procedures ● Demonstrate responsibility for worksite cleanup
AMTC 124 Automotive Engines 5 to 15 credits	● Identify components of a gasoline engine ● Discuss the operation, design, maintenance, and minor repair of gasoline engines ● Observe safe practice and procedures ● Demonstrate good work ethic ● Use mathematics to analyze and repair engine related problems ● Diagnose engine mechanical problems ● Remove and disassemble a gasoline engine ● Clean parts and assemblies ● Use math to measure and inspect engine components ● Perform needed machining operations ● Perform proper reassemble techniques ● Reinstall and test run engine ● Perform final adjustments to an engine ● Clean parts and assemblies ● Dispose of oil and other waste products properly
AMTC 206 Fuels and Emissions 5 to 15 credits	● Apply proper safety procedures ● Properly use tune-up and diagnostic equipment with beginning proficiency ● Test and diagnose fuel related drivability problems ● Test and diagnose computer and sensor electrical problems ● Perform a fuel pressure test ● Identify the major automotive pollutants ● Identify the emission components used to control pollution
AMTC 207 Computer Engine Controls 15 Credits	● Demonstrate proper safety procedures ● Properly use tune-up and diagnostic equipment with increased skill ● Analyze fuel related drivability problems ● Analyze computer and sensor electrical problems ● Analyze a fuel pressure test ● Compare and contrast the major automotive pollutants ● Explain the emission components used to control pollution ● Diagnose driveability and emission related concerns with proficiency

AMTC 214 Automotive Drivetrains 15 Credits	● Practice proper shop safety procedures ● Explain how hydraulic pressure is created and multiplied in the transmission ● Explain mainline pressure, throttle pressure and governor pressure and how they interact to control slippage, up-shifts and downshifts ● Explain lockup and non-lockup torque converter operation ● Perform and interpret pressure tests ● Rebuild an automatic transmission ● Describe the interaction between the engine computer and the transmission computer on electronically shifted transmissions ● Describe the relationship of speed and torque when transferred through gears Identify powertrain components and explain their operation ● Calculate gear ratio ● Diagnose and repair manual transmission/transaxles ● Diagnose and repair front wheel drive constant velocity joints and wheel bearings ● Service universal joints in a conventional driveshaft ● Diagnose and repair rear and/or front drive axles.
BLPT 150 Machine Blueprint Reading 5 Credits	● Identify line and symbol conventions used in industrial blueprints. ● Visualize solid objects from orthographic and isometric projections. ● Develop a basic understanding of industrial design. ● Read and understand industrial blueprints. ● Identify or use concepts such as geometrical tolerancing, surface finishes, AWS welding symbols, and related foundry processes. ● Think inductively and deductively about industrial blueprint problems. ● Begin to apply knowledge of industrial blueprints to complete projects in the machine shop. ● Apply matter principles in the study of blueprint design.
BLPT 160 Blueprint Reading for Welders 5 Credits	● Identify basic lines and identify the three different views. ● Read dimensions and perform basic math operations to check accuracy. ● Identify and comprehend a bill of materials. ● Identify structural shapes. ● Identify welding symbols and basic joints for welding fabrication. ● Explain what groove, fillet, plug, flange, seam, spot, projection, stud, and seam welds are. ● Explain what destructive and nondestructive testing is and identify their test symbols. ● Understand the terminology regarding parts of a weld.
BTEC 104 Intro to Business Technology 5 Credits	● Identify basic components of a personal computer system ● Describe Windows objects. ● Navigate within the windows environment. ● Manage files and folders on both internal and external storage media. ● Identify the fundamental concepts and components of electronic communication and information retrieval, word processing, spreadsheet analysis, graphic presentation, and database management. ● Understand how business technology influences people and procedures in today's business office. ● Be able to enter, edit, format, and print word processing documents such as business letters, memos, and reports. ● Integrate database and spreadsheet functions with word processing functions.

	● Create and manipulate records within a database and generate reports and tables used in business and applications. ● Create, edit, and show a presentation. ● Think inductively or deductively to select the proper computer application and formats.
BTEC 111 Word Processing I 5 Credits	● Create and edit documents ● Format characters and paragraphs ● Enhance and customize paragraphs and documents ● Format and navigate multi-page and multi-section documents ● Maintain and reference documents ● Merging documents ● Creating Envelopes and Labels with merging features ● Creating tables and SmartArt Graphics ● Think inductively and deductively in order to integrate knowledge of spreadsheets, databases, business communications and word processing to create documents. ● Copy paragraph material at a rate of not less than 50 words per minute with five or fewer errors.
BTEC 112 Word Processing II 5 Credits	● Use advanced document customization ● Use advanced editing and proofing techniques ● Utilize document automation features for navigation and formatting ● Enhance documents with references and special features ● Create specialized tables and indexes ● Use advanced merging techniques ● Work with shared documents ● Utilize document protection and security features ● Think inductively and deductively in order to integrate knowledge of spreadsheets, databases, business communications and word processing to create documents. ● Copy paragraph material at a rate of not less than 60 words per minute with five or fewer errors.
BTEC 120 Specialized Applications for Business 3 Credits	● Create OneNote notebooks with sections, pages, and subpages; including use of graphics, images, side notes, and search capabilities ● Manage OneNote properties and integration with other Microsoft applications such as Excel, PowerPoint, and Word ● Articulate and create dynamic organizational charts and solutions for business workflow and process through diagramming ● Customize process diagrams for various business applications; including importing and manipulating external data and graphics ● Articulate solutions for project management through timeline and resource scheduling ● Create tasks, assign resources, and track development of projects, including use of advanced scheduling techniques and customized sharing and reporting of project status ● Complete a capstone project utilizing all three applications.
BTEC 130 Electronic Calculators 1-2 Credits	● Use the "Touch Method" on the calculator to compute solutions to problems of addition, subtraction, multiplication, and division of whole and decimal numbers. ● Enter numeric data on the keypad at the rate of 134 keystrokes per minute on a five-minute timing. ● Use the add mode, constant multiplication, constant division, percent, subtotal, and memory functions of a calculator.

	● Use a calculator to find the solutions to addition, subtraction, multiplication, and division problems, and demonstrate appropriate use of the constant multiplication and division, percent, subtotal, and memory functions of the calculator. ● Use the touch method on the calculator to compute solutions to business problems. ● Schedule their learning time in the self-paced lab to complete the coursework within the quarter. ● Apply knowledge of electronic calculators to business math problems.
BTEC 131 Introduction to Spreadsheets 5 Credits	● Review file management and file types. ● Create a solution to a simple business problem requiring mathematical formulas in a spreadsheet, data entry, simple formatting, planning and modifying worksheets. ● Apply formatting for different data types, conditional formatting. ● Use formulas with relative, absolute, and mixed cell addresses. ● Use simple statistical and financial functions in a spreadsheet application, correct syntax, Quick Analysis tools. ● Use math and trig, date, logical and look-up functions to solve problems, explore What-If Analysis. ● Create graphs using data in a spreadsheet; use Sparklines, Slicers, and Quick Analysis. ● Analyze data with appropriate graph and chart types. ● Explore and use spreadsheet list/database features; Tables, PivotTables, and PivotCharts. ● Understand the differences between a database application and a spreadsheet application. ● Manage Multiple Worksheets and Workbooks; use of 3D and External Referencing. ● Implement Data Validation, worksheet/workbook protection. ● Automate tasks with macro recording; create macro buttons. ● Use advanced Formulas, conditional formulas, and nesting of formulas.
BTEC 135 Advanced Data Analysis 5 Credits	● Describe the purpose and give examples of relational database management system. ● Identify and give examples of the types of data that can be stored and used for business analysis. ● Create and edit tables and establish relationships, generate queries for selecting records, gathering data from multiple tables, and performing calculations and statistical analysis, create forms for data entry, and reports for summary information in MS Access. ● Use advanced formulas and functions in calculations with both Access and Excel. ● Describe and understand how to use advanced Excel functions to solve business problems, analyze business data, and project and forecast trends and patterns. ● Create advanced nested functions, and macros. ● Develop user-defined functions. Create a custom user interface for an application. ● Implement error tracing and evaluate formulas. ● Use Amortization, Income Statement, and Depreciation, Interest, Investment, and Rate of Return. Cost-Volume relationships, and Break-Even functions. ● Use the Financial Scenario Manager and Solution Solver.

	● Import and export data to and from other software, data integration with other office applications; data connection. ● Use spreadsheet database and query features, Data model, Powerpivot. ● Create Web and XML connections. ● Understand Visual Basic for Applications; VB Editor, Sub Procedures.
BTEC 145 Introduction to Word 5 Credits	● Create and manage documents ● Format text, paragraphs, and sections ● Create tables and lists ● Create and manage references ● Insert and format graphic elements ● Complete Microsoft Office Applications Exam for Word Core
BTEC 146 PowerPoint Fundamentals 2 Credits	● Introduce presentation graphics using Microsoft PowerPoint to create electronic slide shows ● Create and edit slide shows ● Apply templates ● Format slides ● Enter text ● Print presentations, create charts, and employ other graphical functions and features. ● Includes a basic coverage of design for presentation best practices. ● Students will have the opportunity to complete the Microsoft Office Applications Exam for PowerPoint.
BTEC 148 Introduction to Outlook 2 Credits	● Start and exit Microsoft Outlook™ ● Set up Microsoft Outlook™ profile ● Manage messaging and email ● Manage calendars and scheduling ● Manage tasks and lists ● Manage contacts, distribution lists, and personal information ● Manage and understand how to work with Microsoft Outlook™ data files
BTEC 161 Intro to ICD-10 Coding, Part I 5 Credits	● Review documentation on patient medical records ● Define abbreviations as they appear on a patient record ● Abstract subjective and objective data from patient records ● Navigate through an ICD19/ICD10-PCS code book ● Select and assign diagnostic code numbers using the International Classification of Diseases 10, Clinical Modification for inpatient and outpatients in a structure lab class ● Select and assign procedural code numbers using the International Classification of diseases 10, PCS for an inpatient setting in a structure lab class ● Explain the importance of correct coding on accurate billing ● Identify the AHIMA Standards of ethical Coding ● Cite and apply current regulations and established coding guidelines in correct code assignment ● Validate coding accuracy by comparing clinical information found in the health record, coding scenarios, and examples ● Recognize and resolve discrepancies between coded data and supporting documentation ● Describe policies and procedures for use of clinical data required in reimbursement in the health care setting.
BTEC 162 Intro to ICD-10 Coding, Part II	● Apply current coding practices for ICD-10-CM, assigning proper diagnostic codes for inpatient, outpatient, and alternative care settings.

5 Credits	● Apply current coding practices for ICD-10-PCS, assigning proper procedural codes for inpatient settings. ● Identify current regulations and established guidelines necessary to properly assign ICD-10-CM code assignments. ● Demonstrate understanding of terminology, and proper utilization of ICD-10-PCS definitions. Demonstrate the use of encoder software to assign codes and compute a CMS DRG. ● Assign DRG's within the reimbursement system utilizing Federal Regulations. ● Utilize AHAS Coding Clinics and other resource materials in the assignment of correct coding. ● Apply ethical standards or practice.
BTEC 163 CPT Coding 5 Credits	● Apply current Level I CPT codes for reporting medical services and procedures by healthcare providers in the following areas: surgery, Radiology, Pathology & Laboratory, medicine & Anesthesia. ● Assign appropriate Level I CPT codes in a structured class. ● Identify level II (National Codes) supplied by the Federal government and Level III (Local Codes) supplied by regional Medicare Part B carriers. ● Apply organization-wide health record documentation guidelines in the selection of E/M services. ● Apply policies and procedures to ensure organizational compliance with regulations and guidelines in the selection of E/M services and CPT procedures. ● Identify E/M codes using CPT/HCPCS. ● Describe and apply current regulations and established coding guidelines in the selection of code assignment. ● Describe policies and procedures for use of clinical data required in reimbursement in the health care setting. ● Describe, compare and apply established guidelines to comply with reimbursement and reporting requirements such as the CCI, Medicare NCD, and LCDS, and NCCI.
BTEC 164 Legal Aspects of the Medical Office 2 Credits	● Define and compare the terms law, ethics, and bioethics. ● Describe managed care and its effect on patients and health care providers. ● Define professional liability and medical malpractice. ● Describe the characteristics a health care employee needs to work effectively in a medical office. ● Explain the types of consent and their uses in the ambulatory health care setting. ● Describe the guidelines for handling medical records including correcting errors, release of information, ownership, confidentiality, and right to privacy. ● Examine the concept of cultural diversity as it relates to the health care setting and your personal beliefs.
BTEC 165 Cultural Awareness for Care Professionals 5 Credits	● Demonstrate advocacy skills for diverse individuals and their identified families, and community groups/populations. ● Define cultural, linguistic, and social differences. ● Describe strategies to educate person-centered care teams and service systems about diverse community needs and cultural perspectives. ● Describe strategies to build individual, clinical team, and community capacity to support people regardless of cultural or racial differences.

	● Provide culturally sensitive information/education on specific health issues and interventions, including identifying and addressing social determinants of health. ● Recognize conflict and utilize conflict resolution strategies
BTEC 171 Medical Reception Procedures 3 Credits	● Choose appropriate filing systems based on given criteria. ● Explain steps in processing medical records. ● Explain rules relating to release of protected health information (PHI) and other health records. ● Describe procedures for amending and correcting health records. ● Demonstrate the process for scheduling patients, using a variety of scheduling systems. ● Identify best practices for record keeping. ● Identify best practices appointment scheduling. ● Explain the impact of the Americans with Disabilities Act on healthcare agency hiring practices and physical space design. ● Describe actions necessary for in-house emergencies, using a variety of examples. ● Perform telephone communication skills, including information/communication dissemination. ● Explain important features of a practice-information brochure. ● Determine the best mailing or shipping methods for a variety of items. ● Write an inventory plan that includes purchasing and receiving supplies. ● Implement time management principles.
BTEC 172 Medical Office Procedures 3 Credits	● Describe the components for processing payroll and payroll tax information for Washington and Oregon employees. ● Relate various types of checks and endorsements to the medical office setting. ● Manage bank account information, including deposits. ● Apply laws to healthcare service fees, credit extension, and debt collection. ● Choose correct diagnosis and procedure codes. ● Perform manual bookkeeping procedures for a medical practice. ● Complete claim forms for third-party payors. ● Apply concepts of managed care and other health-care reimbursement systems. ● Determine amounts for Medicare patient responsibility, using a number of scenarios. ● Explain the processes necessary for Workers' Compensation claims.
BTEC 173 Computers in the Medical Office 3 Credits	● Utilize an EHR system. ● Explain computer concepts including those relating to storage and memory. Create patient accounts. ● Perform computerized bookkeeping and billing. ● Submit medical claims electronically. ● Schedule patients electronically. ● Print and analyze bookkeeping and billing reports. ● Process patient billing statements. ● Perform procedures to backup data.
BTEC 181 Medical Terminology I 3 Credits	● Apply rules of pronunciation, spelling, and formation of singular and plural forms of medical terms. ● Identify the types of suffixes and root/suffix combinations. ● Spell correctly the roots, prefixes, and suffixes, as well as root combinations.

	● Define and apply combining forms. ● Define medical terms. ● Build and analyze medical terms. ● Define common medical abbreviations and symbols used in the medical field.
BTEC 182 Medical Terminology II 3 Credits	● Apply the rules of pronunciation, spelling, and formation of singular and plural forms of medical terms. ● Identify the types of suffixes and root/suffix combinations. ● Spell correctly the roots, prefixes, and suffixes, as well as root combinations. ● Define and apply combining forms. ● Define medical terms. ● Build and analyze medical terms. ● Define common medical abbreviations and symbols used in the medical field.
BTEC 260 Office Procedures 5 Credits	● Identify the roles and responsibilities of the administrative professional. ● Explain the issues and impact of a diverse labor force. ● Demonstrate awareness of the global environment. ● Describe and use effective communication skills. ● Utilize current technology to create and present information. ● Describe effective time management techniques and utilize current technology and web tools to schedule, assign, prioritize and communicate. ● Create and proofread professional business documents. ● Identify and describe organizational finance and personal financial investments. ● Describe characteristics of effective leaders and demonstrate the skills necessary for effective team dynamics.
BUS 100 Foundations of Business Success 5 Credits	● Relate campus culture and campus resources to similar corporate environments; ● Identify successful college behaviors, relate those behaviors to the corporate environment, and apply active learning strategies; ● Apply critical thinking and logical processing to decision making; ● Identify common challenges in reading, written communication, and oral communication and apply strategies to overcome those challenges; ● Integrate personal motivation into goal-setting strategies for career and corporate success; ● Employ organizational processes and tools to improve personal self-management, team interaction, and corporate success; ● Apply math skills to review and report on business analytics and forecast trends; ● Apply corporate team processes to facilitate efficiency in operations; ● Employ technology to improve communication, financial management, human resource management, corporate analytics.
BUS 104 Business Math Applications 5 Credits	● Solve problems involving percentages ● Reconcile a checking account with a bank statement. ● Calculate trade and cash discounts ● Compute mark-ups on cost and selling price, and calculate markdowns. ● Manipulate the interest formula to solve problems involving interest, principal, rate, and time.

	Use financial calculators to solve problems using compound interest and present value. ● Calculate gross and net wages, including the deductions for federal income tax, social security tax, and Medicare tax. ● Calculate an employer's taxes for federal unemployment tax, state unemployment tax, social security, and Medicare. ● Solve simple business problems utilizing algebraic equations.
BUS 119 Business Communications 5 Credits	● Utilize the theory and concepts of the communication process, especially as they apply to business situations and behavior. ● Communicate with others through the use of written and spoken language. ● Use language and punctuation skills accurately. ● Use correct forms of business letters, reports, emails, memoranda, meeting agendas, minutes and proposals. ● Apply the basic techniques of report preparation, including how to collect, evaluate, organize, and present material in an acceptable format. ● Research a business related topic and present an oral report to the class. ● Make decisions using inductive or deductive thought about the selection and organization of content and the choice of media and format. ● Correctly analyze written and oral communication styles. ● Utilize the computer to perform electronic communication and information retrieval, including email communications. ● Prepare resume and letter of application.
BUS 144 Management of Human Relations 5 Credits	● Practice how to place and direct the work of others in the pluralistic workplace. ● Understand human needs, attitudes, perceptions, and motivations and how they apply to business. ● Develop verbal and written communication skills and teamwork skills. ● Develop effective techniques for stress management. ● Understand labor/management relations including implications of related employment law, and its application in the pluralistic workplace. ● Identify the impact of cultural diversity on the formation of attitudes and values. ● Devise strategies for solving problems related to behavior and workforce diversity in an organizational setting. ● Identify the impact of technology, social attitudes, laws, cultural diversity, globalization, individual differences, and other environmental variables on human behavior and organizational effectiveness. ● Develop an awareness of the relationship between effective human relations skills and ongoing career success in the pluralistic, increasingly service-oriented, workplace. ● Identify the challenges and advantages that a diverse workplace can bring to an organization. ● Apply knowledge of business management theory, and demonstrate human relations skills, to specific employee relations situations. ● Question and clarify their values and attitudes about cultural diversity, individual differences, and human relations.
BUS 150 Customer Service/Management	● Describe the philosophy of "service" as it pertains to an organization, the public, and individuals in a pluralistic workplace. ● Distinguish between excellent, good, poor, and unacceptable service

5 Credits	● Apply effective human relations concepts and principles as they relate to customer service strategies in the business environment ● Demonstrate effective telephone techniques including effective listening and message-taking, call screening, and placing phone customers on hold in a professional and polite manner ● Compute the cost-benefits analysis of service to an organization through review and analysis of actual case studies. ● Identify advantages and challenges that a diverse customer base and workforce bring to an organization ● Explore the various dimensions used to describe culture and diversity and identify various approaches to comparing cultural dimensions in order to understand similarities and differences ● Practice strategies and techniques for solving problems related to behavior and customer diversity in a service organization setting ● Question and clarify their values and attitudes about cultural diversity, individual differences, and human relations.
BUS 165 Salesmanship 5 Credits	● Identify the various principles of salesmanship as they pertain to today's business environment. ● Identify major concepts related to buyer behavior and the buying process. ● Practice salesmanship techniques such as: the approach, the presentation, the demonstration of merchandise, responding to objections, closing the sale, suggestion selling, and follow-up. ● Identify ethical and legal issues in selling. ● Practice the verbal and written communication skills required for a sales career. ● Identify techniques used in effective management of time and territory as it pertains to sales
BUS 240 Principles of Supervision 5 Credits	● Explain the nature of management and how supervisors fit into the levels of management ● List supervisory skills and common difficulties supervisors encounter; learn what part supervisors have in planning, directing, and control in an organization. ● Define leadership and explain various leadership theories and styles ● Describe the importance of objectives; state the various kinds, MBO ● Explain the decision-making process. ● Explain time management, time wasters, time logs, and communication to save time ● Review the elements to good learning, how to improve training, develop needs, and evaluate training and professional development. ● Define job satisfaction and explain how it affects work and how job satisfaction affects work. ● Explain and give examples of flextime, compressed work weeks, and job sharing ● Define communication, explain the process, and identify causes of miscommunication and how to avoid their pitfalls. ● Define listening, listing the different stages and the problems of ineffective listening. ● Review both verbal and nonverbal communication, horizontal and vertical communication, and the grapevine system and its problems. ● Identify common cultural problems at work ● Define self-esteem and how and why to improve it in workers. ● Explain the appropriate steps in counseling troubled employees.

	● Define groups, and explain the benefits of group homogeneity and heterogeneity. ● Identify benefits and problems of group decision-making and group thinking. ● Define motivation and review the theories. ● Explain the interview process, its importance, and the problems that might hurt the organization. ● Review the steps in selecting employees. Explain the purpose, process, and techniques of appraisals. ● Define conflict, its common strategies, and causes. Show the strengths and weaknesses of unions and their changing roles. Define a grievance and how to prevent them. ● Explain discipline, both progressive and discipline-without-punishment. ● Define the effects of substance abuse in the workplace and employee problems with issues such as stress, smoking, AIDS, and accident prevention ● Explain the nature of sexual harassment, office politics, ethical behavior, and discrimination, and their effects on the worker and the organization.
BUS 244 Human Resources Management 5 Credits	● Determine the financial impacts of HRM. ● Apply employment laws to simulated workplace scenarios. ● Evaluate and apply effective recruiting processes. ● Determine staffing needs and develop effective a strategic talent management plan. ● Evaluate and develop effective employee training and development strategies. ● Evaluate and apply effective performance appraisal techniques. ● Evaluate and apply effective pay and incentive methods. ● Evaluate and apply effective employee benefit programs. ● Simulate effective collaboration in collective bargaining workplaces. ● Apply ethical decision making in simulated workplace scenarios. ● Discuss employee safety programs and relevant employment law.
BUS 245 Principles of Management 5 Credits	● Define management. ● Describe four management functions. ● Describe differences in management functions by level. ● Describe conceptual, human, and technical skills and their relevance for managers and non-managers. ● Define ten roles that managers perform in organizations ● Identify the major developments in the history of management thought: classical, human resources, management science, systems, and contingency. ● Describe the task and general environments of business. ● Define corporate culture and give examples. ● Explain how organizational symbols, stories, heroes, slogans, and ceremonies relate to corporate culture. ● Define ethics and explain how ethical behavior relates to behavior governed by law and free choice. ● Explain the utilitarian, individualism, moral-rights, and justice approaches for evaluating behavior. ● Describe how both individual and organizational factors shape ethical decision-making. ● Define corporate and social responsibility.

	● Explain effective communication, the global environment, human resource management, entrepreneurship, diversity, managing teams, operations management, and managerial decision making.
BUS 259 Start/Managing a Small Business 5 Credits	● Describe the characteristics of small businesses. ● Describe the characteristics, requirements, benefits, and risks, of being an entrepreneur. Apply strategies for planning, organizing, and entering into, a small business venture. ● Apply the fundamentals of effective product production, marketing, planning and control in a business plan. ● Apply math and accounting in creating a feasibility plan and business plan for a new business venture. ● Create a feasibility plan and business plan using industry standard (“plan writer”) software applications. ● Read, write and speak clearly and effectively. ● Apply interpersonal communication and teamwork skills in a project environment. ● Seek a state of healthy self-esteem and self-confidence through learning to think like an entrepreneur.
BUS 264 Principles of Marketing 5 Credits	● Define marketing and explain how it fits into business. ● Explain the growth-share matrix and the SWOT analysis. ● Identify key agencies and organizations involved in marketing, and define their functions: FTC, NARB, BBB, etc. ● Identify key ethical issues in marketing, social responsibility, and consumerism. ● Explore and define key terms and concepts in international marketing, as well as cultural and social forces. ● Identify and demonstrate the marketing research process. ● Define key marketing terms and concepts including marketing mix, promotional mix, product life cycle, wholesaling and retailing, goods and services, consumer buying behavior, pricing, and new product development. ● Differentiate between a business and consumer market.
BUS 270 Introduction to Project Management 5 Credits	● Develop cognitive project maps that overview project stages/phases and assess the complexity level of a project, including related factors. ● Describe the process and tools of project management: scoping; planning; budgeting; managing costs, quality, and risk; procurement, and closeout. ● Define the various roles of the project manager. ● Effectively apply management tools of the Project Manager: managing meetings, developing teams, managing client expectations and satisfaction, cultivating an appropriate project culture, and motivating project team members. ● Identify and apply varying management styles/approaches appropriate to project stages and phases. ● Effectively utilize industry standard software applications to accomplish common project management tasks, including but not limited to: ● Preparing project scope statements and work breakdown structures (WBS) for both simple and complex projects. ● Creating project activity lists with precedents, durations, and Gantt chart. ● Creating PERT (program evaluation and review technique) charts and identifying the critical path and float.

	● Preparing project status reports, including management dashboards, budget status, time/schedule status, and resource status.
BUS& 101 Introduction to Business 5 Credits	● Summarize current trends which affect business ● Discuss world economic systems including capitalism, socialism, and communism, including advantages and disadvantages ● Identify the four types of competition in a free market system ● Review economic issues affecting business; discuss productivity, unemployment, inflation, CNP, CPL, supply-side economics, monetary policy, the federal deficit, and taxes ● Explain the forms of business ownership in a capitalistic system and list the advantages and disadvantages of each ● Define entrepreneurship and franchising, list the types of persons who succeed at each; show statistics on success ● Review why people would start and work for a small business, including success rates, financing, business plans, and how to obtain advice from knowledgeable sources. ● Explain the principles of marketing, its history, the marketing concept (four Ps) marketing mix, marketing functions, utility, segmentation, targeting, and research ● Describe brands and branding, packaging, labeling, product development, product life cycle. Illustrate break-even point analysis. ● Show distribution system for wholesaling and retailing, while focusing on the transportation modes, containerization, warehousing, scrambled merchandising, and the wheel of retailing ● Explain what promotion and marketing research are, showing the types and the advantages of each. ● Define management and its four functions: planning, organizing, leading, and controlling. ● Review production processes including MRP, JIT, Robotics, PERT Gant charts, and quality control. ● Discuss the importance of managing data into information, the history of computers, technology trends of the future ● Define motivation, viewing the theories concepts ● Break down human resource management into selection, training, appraisals, pay systems, and discrimination. ● View employee-management issues, unions, contracts, grievances, comparable worth, and controversial issues ● Review the basics of accounting through the accounting cycle and financial statements ● Look at financial management in terms of both short and long term financing of company operations including debt and equity financing ● Show legal and ethical sides of business including types of laws, contracts, bankruptcy, antitrust legislation, consumerism and ethics. ● Describe the international side of business, MNCs protectionism, strategies, social, cultural and economic issues.
BUS& 201 Business Law 5 Credits	● Describe various legal concepts and terms. ● Analyze case studies and identify key legal issues. ● Apply appropriate legal principles, rules, and laws to case studies and hypothetical legal situations. ● Describe how the civil legal system functions. ● Describe the importance of contractual relationships. ● Discuss basic legal concepts and selected areas of law affecting business transactions.

	● Use legal terminology correctly during discussions and in written assignments. ● Recognize ethical issues and their legal implications in business. ● Reason clearly, responsibly and succinctly when presented with legal problems, hypotheticals and questions. ● Recognize the connections between various areas of the law relating to business. ● Demonstrate understanding of various business law concepts and subjects including business organizations as related to small businesses, government constitutional authority and regulation, criminal law as relating to business and international business law issues as relating to business relations between the United States and other countries through class discussions and writing.
CDS 105 Chemical Dependency/Domestic Violence 3 Credits	● Describe current legal issues relative to chemical dependency and domestic violence ● Describe the relationship of chemical dependency to domestic violence ● List community resources available to clients needing assistance for chemical dependency/domestic violence ● List strategies for the treatment of victims ● List strategies for awareness, assessment and treatment of batters ● Understand the dynamics of domestic violence
CDS 108 Community & School-Based Prevention/Intervention 4 Credits	● Discuss the history of the prevention discipline ● Identify models of prevention ● Discuss the role and function of prevention/intervention programs in different settings ● Discuss the use of media in prevention strategies ● Illustrate the strategic prevention framework ● Discuss group development ● Define advocacy ● Identify basic principles of grant writing ● Discuss best practices and effective prevention programs
CJ 154 The American Legal System 5 Credits	● Demonstrate knowledge and understanding of the various components and occupations in the American legal system and in what each plays a role. ● Apply analysis of constitutional legal basics and how they relate to the history and evolution of the legal system in the United States. ● Demonstrate an understanding of the sociological and historical reasons for development and current application of the American Legal System in both criminal and civil cases.
CJ 180 Report Writing for Law Enforcement 5 Credits	● Use observation skills to prepare accurate, detailed field notes. ● Use simple, concise, clear language to convey critical information for a report Write clear, concise, organized, effective report narratives. ● Demonstrate understanding of how to effectively and accurately use various report forms. ● Demonstrate investigative proficiency. ● Apply all learned skills to the final project.

CJ 184 Administration of Justice 5 Credits	● Demonstrate an understanding of the history, evolution and function of state and federal criminal procedures. ● Utilize and demonstrate critical thinking and analysis in effective verbal and written communication, relating to criminal procedure in state and federal courts. ● Demonstrate an understanding of the principles of criminal procedures, including the U.S. Constitution, federal law and state law and how they relate to the functions of the legal system, through discussion and writing. ● Demonstrate an understanding of Washington State and U.S. Supreme Court decisions, their change as society changes and how they affect law enforcement, prosecution and defense procedures, from arrest through appeals and punishment.
CJ 260 Physical Evidence and Criminalistics 5 Credits	● Be able to recognize physical evidence and know where the responsibility lies for its analysis and presentation in court. ● Present a simulated crime scene. Should be able to recognize and state the correct procedures for preserving the physical evidence and record the initial appearance of the scene. ● Know the various classes of drugs and recognize some of the techniques used to establish their identity. ● Be able to state the difference between class and individual characteristics and recognize these differences in fingerprints, shoe prints and tool marks. Preservation is also important. ● Be able to recognize the types of problems encountered when firearms are used in crimes, and how the laboratory establishes the identity from bullets and cartridge cases. ● Recognize the potential evidential value of documents as evidence and be able to state the types of materials or samples that are required to establish the identity of origin of handwritten material. ● Be able to recognize and state the proper technique for preserving bloodstains for pattern analysis and identification. The student also should be able to recognize the methods for other identification and other physiological fluids. ● Be able to state the potential value of clothing, tools, vehicles and weapons as potential evidence. The student should know how to collect and preserve this evidence to obtain the optimum evidentiary value.
CJ& 101 Intro to Criminal Justice 5 Credits	● Learn basic knowledge of the criminal justice system. ● Understand the role of the actors within the criminal justice system. ● Complete a research paper on a selected topic regarding the criminal justice system. ● Appreciate the philosophy of police and corrections work. ● Understand the role of the Constitution in setting guidelines through the criminalization process.
CJ& 106 Juvenile Justice 5 Credits	● Effectively apply a broad range of juvenile justice system terminology. ● Examine the history and evolution of the juvenile justice system and their effects on current juvenile justice policies and practices within the United States. ● Examine the major theories and psychological foundations of delinquent behavior.

	● Analyze the association between social, economic, personal, and demographic factors that influence directional changes, trends, and crime rates of delinquent behavior. ● Distinguish the differences between the adult and juvenile justice systems ● Describe the laws, procedures, prevention programs, and agencies (private, non-profit, county, state, and federal) of the juvenile justice system. ● Examine the roles, responsibilities, and discretionary powers of juvenile justice professionals, as well as external professions that impact the juvenile justice system. ● Identify the effects of diversion programs on the individual, the family, and society. ● Identify the evolution of criminal procedure as it applies to the juvenile justice system. ● Analyze the current issues and challenges of diverse populations within the juvenile justice system.
CJ& 110 Criminal Law 5 Credits	● Demonstrate an understanding of the evolution and function of criminal law and the legal system from a criminal justice perspective and considering sociological influences. ● Utilize and demonstrate critical thinking and analysis of criminal law concepts in effective verbal and written communication. ● Demonstrate an understanding of the principles and practice of criminal law in statutes and appellate case law. ● Demonstrate analysis and understanding of how the facts of hypothetical crime scenarios and criminal law relate.
CS 110 Intro to Microcomputer Applications 3 Credits	● Examine the components of a personal computer system and discuss the criteria for evaluating a microcomputer system. ● Discuss the purposes of and differences between application software and systems software. ● Identify the major categories of application software. ● Use basic functions of a word processing application to create letters and other documents. ● Use basic functions of an electronic spreadsheet application to create simple worksheets.
CS 170 Fundamentals of Computer Coding 5 Credits	● Diagram the hardware of a computer and relate it to program execution. ● Develop various algorithms for programmatic implementation. ● Adopt meaningful documentation and coding styles. ● Apply the fundamental concepts of structured programming. ● Use Visual Studio for developing software. ● Write programs using data types and variables of a given type. ● Write programs using pre-defined and programmer defined functions. ● Write programs using arithmetic, relational and logical expressions. ● Write programs using various control structures such as conditional statements and loops. ● Write programs that manipulate arrays and strings. ● Write programs that manipulate sequential files. ● Review the current literature and write at least one review article dealing with some aspect of computer science
DHET 100 Essentials of Mechanics 5 Credits	● Relate industrial safety practices to various mechanical jobs. ● Apply knowledge of basic skills relative to further study in the automotive or diesel programs.

	● Demonstrate a mastery of basic machine, tool, and material processes in the mechanical industries. ● Apply educational skills of communication, problem solving, and computation as they relate to industry. ● Be acquainted with industrial work procedures as applied to identified tasks. ● Use appropriate hand tools, portable power tools, measuring and testing equipment, and power machinery. ● Access and utilize technical reference manuals, specification charts, trade journals, and computerized repair data. ● Possess technical skills and knowledge needed for advanced training in the automotive or diesel program. ● Develop teamwork skills in solving problems using inductive and deductive thought.
DHET 104 Electrical Systems 15 Credits	● Interpret wiring diagrams ● Identify electrical circuit components ● Test components to determine needed repairs ● Diagnose general electrical systems ● Diagnose and service a battery ● Diagnose and repair starting system ● Diagnose and repair lighting system ● Diagnose and repair driver information system ● Diagnose and repair power accessories
DHET 105 Vehicle Climate Control 5 Credits	● Use safety procedures necessary for working with (HVAC) systems ● Explain the principles of heat movement within (HVAC) systems ● Explain the operation of (HVAC) components ● Properly use diagnostic equipment ● Use refrigerant recovery equipment ● Identify systems which use various types of refrigerants
ECED& 105 Intro to Childhood Education 5 Credits	● Explain current theories and ongoing research in early care and education. ● Describe the role of play in early childhood programs. ● Compare early learning program models. ● Explain the importance of developing culturally responsive partnerships with families. ● Identify appropriate guidance techniques used in early care and education settings. ● Describe the observation, assessment, and teaching cycle used to plan curriculum for all young children. ● Apply the professional code of ethics for early care and education to resolve dilemmas. ● Describe major historical figures, advocates, and events shaping today's early childhood education
ECED& 107 Health/Safety/Nutrition 5 Credits	● Describe federal and state mandated health, safety, and nutrition practices. ● Identify indicators of illnesses/ infectious diseases and steps to prevent the spread of them. ● Outline safety procedures for providing emergency care and daily care. ● Evaluate program safety policies. ● Describe food programs and practices that support the development of children.

	● Create examples of developmentally appropriate and culturally responsive health, safety, and nutrition education materials and activities. ● Describe the responsibilities of mandated reporters.
ECED& 120 Practicum-Nurturing Relationships 2 Credits	● Describe the characteristics of nurturing relationships built between teachers and children. ● Practice ideals of professionalism in work with children, families and peers. ● Recognize cultural responsiveness when observing professionals and programs. ● Identify practices that promote health, safety, growth and development of children.
ECED& 160 Curriculum Development 5 Credits	● Explain major early childhood curriculum theories and current trends in curriculum design for early learning environments. ● Apply principles of developmentally, individually and culturally appropriate practice when designing, implementing and evaluating curriculum. ● Evaluate integrated learning experiences supportive of children's development and learning incorporating national, state and local standards. ● Design curriculum that supports children's language/communication, cognitive, social/emotional, fine/gross motor and creative development. ● Design curriculum that is inclusive and represents the diversity of children and families. ● Plan developmentally appropriate activities and schedules, which promote all children's growth and learning. ● Observe, document and assess individual and group needs, interests and skills for the purpose of curriculum planning and on-going modifications of plans
ECED& 170 Learning Environments 3 Credits	● Design healthy, respectful, supportive, and challenging learning environments for children. ● Identify strategies to achieve compliance with Washington Administrative Code and other state or federal regulations. ● Create environments that promote growth in all developmental domains and academic disciplines. ● Establish environments, routines, and schedules that promote children's age-appropriate, self-regulated behaviors. ● Establish environments that promote the cultural diversity of children, families, and their communities.
ECED& 180 Language and Literacy Development 3 Credits	● Explain the continuum of language acquisition and early literacy skills. ● Develop evidence-based, appropriate environments and opportunities that support children's emergent language and literacy skills. ● Describe strategies for responding to children who are culturally, linguistically, and ability diverse. ● Develop ways to facilitate family and child interactions as primary contexts for heritage language and English development. ● Analyze images of culture and individual abilities reflected in children's literature and other learning materials. ● Utilize developmentally appropriate and culturally responsive assessment practices for documenting the growth of language and literacy skills.
ECED& 190 Observation/Assessment	● Describe reasons for collecting observation and assessment data.

3 Credits	● Identify indicators of growth, development, learning and social behaviors in all children. ● Identify techniques for avoiding bias, judgments, and assumptions in observations. ● Collect factual, descriptive data using a variety of assessment tools and strategies. ● Document and analyze assessment data for use in planning curriculum for individuals and groups of children.
ECON 105 Introduction to Economics 5 Credits	● Define scarcity in the context of choice and cost. ● Outline the role of comparative advantage in exchange. ● Explain how prices are determined in perfectly competitive markets ● Analyze the role of prices in the distribution of goods, services, and resources. ● Apply the concept of elasticity. ● Analyze the behavior of individual firms in the short run and long run. ● Use national income statistics to describe and analyze the economy in quantitative terms. ● Compare and contrast macroeconomic theories of output, employment, and income. ● Explain the structure of the banking system in the context of the money supply, credit, and The Federal Reserve. ● Analyze fiscal and monetary policy using macroeconomic models.
ECON& 201 Micro Economics 5 Credits	● Define scarcity in the context of choice and cost. ● Outline the role of comparative advantage in exchange. ● Explain how prices are determined in perfectly competitive markets ● Analyze the role of prices in the production and exchange of goods, services, and resources. ● Apply the concept of elasticity. ● Analyze the behavior of individual firms in the short run and long run. ● Use microeconomic models to illustrate how prices are determined in imperfectly competitive markets. ● Identify instances of market failure. ● Evaluate alternative strategies to improve economic outcomes
EDUC& 150 Child, Family, Community 3 Credits	● Evaluate and describe the cultural influences, social issues, changes and transitions that affect children, families, schools and communities. ● Examine the concept of family, school, peers, media and community as socialization agents. ● Analyze strategies that empower families to establish and maintain collaborative relationships to support the growth and development of children. ● Identify how one's own family history and life experiences may impact relationships with children and families. ● Identify community services and agencies that support the needs of children and families and establish resource and referral systems for parents and educators.
EDUC& 205 Intro to Education with Field Experience 5 Credits	● Demonstrate knowledge of teaching as a career ● Recognize the ways that teaching has changed over the past two centuries as well as the ways it may change in the years to come ● Recognize the characteristics of effective teaching ● Identify contemporary issues in education ● Identify professional career opportunities in teaching

	● Recognize how schools and teachers deal with students of differing abilities and learning styles ● Demonstrate knowledge of instructional resources in the classroom ● Understand the diversity of students in America's schools and learn how schools and teachers deal with these differences ● Assess their own strengths as future teachers and make appropriate career plans ● Demonstrate professional behavior and appearance in roles as observers and/or assistants in the field placements classrooms ● Critically evaluate and assess their beliefs about race, ethnicity, class, gender, ability and religion by participating in the classroom activities and assignments ● Comprehend the historical effects that racial discrimination, bigotry, and other forms of intolerance have on the field of education ● Examine the diversity of students in America's educational system. ● Develop educational strategies to support the education needs of diverse students. ● Examine economic and social justice in the education system.
ENGL 110 Industrial Communications 5 Credits	● Demonstrate interpersonal communication skills such as listening, feedback, and problem-solving while working collaboratively in small groups. ● Summarize and paraphrase texts in writing, including a variety of written summary types ● Write paragraphs, memos, emails, letters and reports of varied length exhibiting unity, coherence, conciseness, and adequate development ● Apply a writing process that includes generating original ideas, drafting and revising for appropriate audience, and editing for correctness and style ● Write correct sentences demonstrating use of grammar and mechanics appropriate to context Find relevant sources, including sources from library databases ● Document sources ethically, using a formal style such as MLA, when applicable ● Develop and present an oral report specific to business and industry ● Analyze and incorporate visual and textual content effectively
ENGL& 235 Technical Writing 5 Credits	● Examine the purpose and process of composing technical material and the importance of audience analysis. ● Examine the techniques that lead to readability for a multi-layered audience, including logic and organizational pattern, direct language, and effective visual display. ● Examine the processes involved in data gathering, including interview, observation, and library search. ● Compose and present an extended formal technical report following a format and documentation style appropriate to the student's discipline of study.
ENGR& 121 Engineering Graphics I 1-3 Credits	Use both manual and computer-aided design equipment while being introduced to and applying the following: ● The key roles that graphics in design, such as visualization, communication, and documentation; ● Sketching as a tool in the design process; ● Line quality and drawing technique to manual drafting exercises using basic drafting equipment; ● Lettering technique to manual drafting exercises using basic drafting equipment;

	● Geometric construction techniques; ● Designing and modeling with computer-aided design (CAD) software; ● Drawing basic and complex shapes accurately with CAD software; ● Using CAD software as a tool in the design process; ● Creating multi-view sketches/drawings and orthographic projection of objects to communicate a design; ● Creating a pictorial view to communicate a design; ● Creating section views to communicate a design; ● Creating auxiliary views to find true length of oblique lines, true size and shape of surfaces, and true angles between lines and principal planes; ● Recognize and employ ISO and ANSI drafting standards; ● Create a basic dimensioning drawing to document
ENGR& 122 Engineering Graphics II 1-3 Credits	Use both manual and computer-aided design equipment while being introduced to and applying the following: ● Creating drawings of designs and models with dimensions and tolerances; ● Creating working drawings that provide information required to make a part of an assembly of a final design; ● Creating symbols for multiple use with CAD software; ● Drawing representation of various fasteners; ● Revolution method towards finding the true length of a line, true angle and normal view of a plane; ● Locating lines tangent to a curved surface and planes tangent to cones, cylinders and spheres; ● Development of surfaces in the construction of a pattern that represents the unfolded or unrolled surface of the form; ● Communicating sets of given data through the appropriate forms of charts and graphs; ● Creating three-dimensional models 9wire frame, surface, and solid models) with CAD software; ● Creating parametric solid models with CAD software; ● Setting plot parameters and plotting objects created with CAD software.
ENGR& 123 Engineering Graphics III 1-3 Credits	Use both manual and computer-aided design equipment while being introduced to and applying the following: ● Creating three-dimensional model assemblies with CAD software; ● Creating parametric solid models with CAD software; ● Advanced display and presentation methods for two- and three-dimensional CAD drawings; ● Describing the position of a line in space by its bearing, azimuth angle, and grade; ● Locating piercing points of a line to a plane using auxiliary view, two-view, and imaginary cutting-plane methods; ● Locating intersectional boundaries of planes with solids; ● Identifying and representing parallel lines, planes, lines to planes, and planes to lines in space; ● Identifying and representing perpendicular lines and lines to planes using auxiliary- view and two-view methods; ● Horizontal projection to topographic map-making; ● Mining and geology technical terms such as strike, dip, stratum, bedding plane, vein, fault, and outcrop towards the graphical solution of problems within these fields;

	● Solution techniques to cut and fill or dump line problems.
HLTH 100 Occupational Safety and Health 3 Credits	● Demonstrate proper CPR-D techniques as defined by the American Heart Association for adults, children and infants. ● Demonstrate proper emergency first aid techniques in simulated emergency situations. ● Identify concepts associated with defining acceptable levels of risk relative to providing emergency first aid. ● Identify risk reduction behaviors and actions relative to bloodborne and airborne pathogens including AIDS. ● Complete a research project on occupational safety. ● Identify the type of personal protective devices needed for a given work situation. ● Identify the basic features of OSHA and WISHA. ● Conduct a safety assessment survey of a given work environment.
HLTH 105 First Aid, CPR and Bloodborne Pathogens 1 Credit	● Demonstrate proper CPR-D techniques as defined by the American Heart Association for adults, children and infants. ● Demonstrate proper emergency first aid techniques in simulated emergency situations. ● Identify concepts associated with defining acceptable levels of risk relative to providing emergency first aid. ● Identify risk reduction behaviors and actions relative to bloodborne and airborne pathogens.
HLTH 106 Health and Wellness 2 Credits	● Define health and health theories ● Create a behavior management plan to change a health-related behavior ● Discuss psychological health ● Describe stress and create a stress management plan ● Explain the qualities that help people develop and retain personal relationships (intimate, family, friendships) ● Discuss human sexuality and contraceptives ● Explain factors contributing to drug use and addiction ● List short and long term health risks associated with alcohol and tobacco use ● Describe guidelines used to put together a healthy diet ● Discuss how to develop each of the health-related components of fitness ● Identify risk factors for obesity and describe ways to successfully manage body weight ● Explain what cancer is and list common cancers ● List steps you can take to lower risk of cardiovascular disease and cancer ● Explain how energy use affects the environment, and describe steps everyone can take to use energy more efficiently ● Describe the basic premise of complementary and alternative health care ● List strategies for healthy aging
IT 100 Intro to Information Systems 5 Credits	● Compare and contrast common Operating systems and their functions and features ● Identify common programs, applications, and their purpose ● Demonstrate software management best practices ● Identify alternative technologies and their purpose (virtualization, cloud computing, etc)

	● Explain the basic software features and functions of wireless devices ● Identify basic wired and wireless peripherals and their purpose ● Compare and contrast common computer connector types ● Identify the purpose of internal computer components ● Analyze basic security threats ● Demonstrate best security practices ● Recommend web-browsing best practices ● Demonstrate setup and configuration of a basic SOHO router (wired/wireless) ● Compare and contrast cellular, wireless, and wired data connections ● Compare and contrast different methods of sharing and storage ● Use appropriate steps to set up a basic workstation ● Explain the basic methods of navigating an operating system ● Analyze basic support concepts ● Describe the importance and impact of various and environmental and safety concepts
IT 102 Intro to Internet Theory, App, and Web Page Design 5 Credits	● Describe the Internet and the World Wide Web. ● Copy and send files using File Transport Protocol (FTP). ● Describe web page usability and design principles. ● Demonstrate understanding of methods of usability, accessibility, and design in web page development. ● Describe and demonstrate the functions of a web page editor. ● Design and implement (X)HTML and CSS web pages that utilize good design principles. ● Describe the difference between the structural and presentational components of a web page. ● Design and implement web pages using multimedia. ● Describe how multimedia can enhance and/or detract from the presentation of web pages. ● Design and implement W3C standards valid webpages. ● Review current literature and write a critical review of at least one article pertaining to the web page design.
IT 111 Introduction to Windows 4 Credits	● Describe the functions of a microcomputer operating system ● Prepare a disk for use by the Windows operating system ● Create a hierarchical directory structure on a disk ● Customize a desktop to meet specified requirements ● Review current literature and write a critical review of at least one article and/or book dealing with the current or future use of microcomputer operating systems ● Describe Windows objects ● Manage files and folders on both internal and external storage media ● Integrate World Wide Web features into the Windows desktop ● Search for files using a variety of criteria ● Create a graphic file ● Create a multimedia document using object linking and embedding ● Access resources on a local area network ● Backup files and folders to external storage media ● Restore deleted files and folders ● Monitor the system performance of a personal computer ● Manage local users and groups ● Manage local security policies ● Install, maintain, and troubleshoot a peripheral device ● Install and configure a software application ● Maintain a hard disk with Windows disk management tools

	● Protect a computer from viruses ● Protect a computer from outside intruders ● Manage power features
IT 140 Configuring Windows Operating Systems 4 Credits	● Identify Windows editions and features available with each edition. ● Describe Windows, installation and upgrade methods, and preserving user profiles and data using migration tools. ● Explain the basics of domain networking: Active Directory and Group Policies. ● Describe the concepts involved in capturing a system image. ● Demonstrate the ability to create a Virtual Hard Disk and apply a Windows image to the file. ● Demonstrate the ability to configure devices and drivers, managing disk partitions and volumes. ● Explain various methods for optimizing a disk drive. ● Demonstrate the ability to examine application issues. ● Identify methods of protecting the system configuration using the User Account Control, configuring Internet Explorer and MS Edge. ● Demonstrate the ability to configure IPv4 and IPv6 network addresses, Internet Connection Sharing, wireless networking, Windows Firewall, and Windows Firewall with Advanced Security. ● Demonstrate the ability to configure authentication and authorization, NTFS permissions, and resource sharing. ● Identify methods for managing printer sharing, auditing, encrypting files and folders, and configuring BranceCache. ● Demonstrate the ability to configure remote connections including Network Access Protection and VPN's. ● Demonstrate the ability to configure Direct Access, BitLocker and BitLocker To Go, and configuration and managing options for mobile devices. ● Demonstrate the ability to use tools for troubleshooting, monitoring system events, monitoring performance and resource, ensuring the reliability and performance of a system, optimizing system performance, managing system updates, and remote management of computers. ● Describe the importance of backup and recovery; system backup, file recovery, and system recovery. ● Develop a plan for backup and recovery of system and data files.
IT 141 PC Technician I 4 Credits	● Describe and configure settings and use BIOS/UEFI tools on a PC ● Explain the importance of motherboard components, their purpose, and their properties ● Compare and contrast various RAM types and their features ● Install and configure devices storage devices and use appropriate media ● Install and configure PC expansion cards ● Compare and contrast various PC connection interfaces, their characteristics, and purpose ● Identify common PC connector types and associated cables ● Install and configure common peripheral devices ● Compare and contrast types of display devices and their features ● Evaluate and select the appropriate components for a custom PC configuration, meeting customer specification or needs ● Identify the various types of network cables and connectors ● Compare and contrast the characteristics of connectors and cabling

	● Compare and contrast Internet connection types, network types, and their features ● Compare and contrast network architecture devices, their functions, and features ● Explain the properties and characteristics of TCP/IP ● Explain the common TCP and UDP ports, protocols, and their purpose ● Compare and contrast various Wi-Fi networking standards and encryption types ● Install and configure SOHO wireless/wired router and apply appropriate settings ● Install and configure laptop hardware and components ● Explain the function of components within the display of a laptop ● Explain the characteristics of various types of mobile devices ● Compare and contrast accessories and ports of other mobile devices ● Install, configure and perform printer installation and printer maintenance ● Describe and use the appropriate network troubleshooting tools ● Describe and use troubleshooting tools in regard to issues relating to motherboards, RAM, CPU, and power ● Troubleshoot and fix hard drives, RAID arrays, and other storage solutions ● Troubleshoot and fix common video, projector, and display issues ● Troubleshoot and fix common wired/wireless network issues ● Troubleshoot and repair common issues with mobile devices while adhering to appropriate procedures
IT 142 PC Technician II 4 Credits	● Compare and contrast various features and requirements of Microsoft Operating systems (Vista, Windows 7, Windows 8, Windows 8.1, Windows 10) ● Use appropriate Microsoft operating system features and tools ● Perform common preventative maintenance procedures using the appropriate Windows OS tools ● Perform a set-up and use client-side virtualization ● Compare and contrast differences of basic Windows OS Security settings ● Install Windows PC operating system using appropriate methods ● Apply and use basic command-line tools for troubleshooting and preventative maintenance ● Install and configure Windows Networking on a Client/desktop ● Identify common features and functionality of the Mac OS and Linux operating systems ● Identify common security threats and vulnerabilities ● Compare and contrast differences of basic Windows OS Security settings ● Deploy and enforce security best practices to secure a workstation/client ● Compare and contrast various methods for security mobile devices ● Demonstrate appropriate data destruction and disposal methods ● Identify basic cloud concepts ● Summarize the properties and services provided by networked hosts ● Identify basic features of a mobile operating system ● Install and configure basic mobile device network connectivity and email ● Summarize methods and data related to mobile device synchronization

	● Identify appropriate safety procedures ● Summarize the process of addressing prohibited content/activity, and explain privacy, licensing, and policy concepts ● Demonstrate proper communication techniques and professionalism
IT 230 Database Development 5 Credits	● Define components of a DBMS. ● Discuss the three major integrity paradigms. ● Define first, second, and third normal form. ● Design a relational database model in third normal form. ● Define the three major models of database systems. ● Complete a DB design using Entity Relationship Database Model ● Develop SQL procedures to query a business application. ● Define the general levels of security for databases. ● Create, modify, and maintain a database used to solve common business problems.
MASP 107 Machining for Related Occupations 2-6 Credits	● Show the ability to read basic measuring instruments. ● Calculate the proper speeds and feeds of various materials. ● Describe general shop safety practices. ● Show a working knowledge of layout processes and hand tools. ● Identify the various types of drill presses and hole operations. Show a general knowledge of the engine lathe and it's safe operation. ● Identify the various types of milling machine and their accessories. ● Show a basic knowledge of milling machine operations. ● Identify the various types of precision grinders and their accessories. ● Show a basic knowledge of grinding operations.
MASP 111 Machine Shop I 2-10 Credits	● Learn and practice shop safety procedures. ● Apply practical math to solve shop problems. ● Study basic cutting tool shapes and grind tools for shop use. ● Practice job planning to complete designed projects using a variety of machine tools. ● Use precision measuring instruments to check part dimensions
MASP 112 Machine Shop II 2-10 Credits	● Use reference material to find specifications required to complete projects ● Show the ability to think beyond problems and overcome minor setbacks encountered in the machining process ● Calculate proper speeds and feeds of different types of materials ● Indicate a part to within .002 TIR in a four-jaw chuck ● Cut internal threads on a lathe
MASP 113 Machine Shop III 2-10 Credits	● Use a milling machine to cut parts flat and square ● Cut slots and keyways holding set dimensions ● Indicate the milling head square to the machine table
MATH 105 Mathematics for Health Sciences 5 Credits	● Demonstrate mastery of computational processes by adding, subtracting, multiplying and dividing rational numbers and decimal numbers; evaluating and rearranging formulas; applying percentages to the health sciences. ● Demonstrate mastery in the use of measurement systems in health sciences ● Perform calculations needed to determine dosages, prepare solutions and find rates of intravenous medication ● Compute powers of ten and logarithmic problems ● Construct and read graphs illustrative of the health sciences ● Demonstrate understanding of arithmetic concepts by recognizing the properties of real numbers; recognize basic properties of exponents

	● Demonstrate understanding of algebraic concepts by determining whether a number is a solution to a particular equation ● Recognize statements and conditions of variation and proportionality ● Identify differences in direct and inverse variation ● Recognize the value of the number ten in the metric system ● Identify regions of bar, circle, and line graphs which correspond to specific conditions.
MATH 106 Industrial Mathematics 5 Credits	● Demonstrate arithmetic fundamentals of addition, subtraction, multiplication and division of whole numbers with applied work problems and be able to determine the correct order of operations to be used in complex problem solving. ● Identify equivalent fractions, multiply, add, subtract and divide fractions and mixed numbers. Compare and reduce fractions and mixed numbers. ● Perform the basic arithmetic operations on decimals and be able to convert decimals to fractions and vice versa. Round decimals, use and calculate averages, evaluate exponents and square roots, use signed numbers in solving word problems. ● Convert percentages to fractions and decimals and vice versa, and solve applied problems involving percents. ● Apply arithmetic operations to measurement numbers using fractions and decimals to convert units. ● Gain an understanding of accuracy and precision and the use of significant digits. ● Become familiar with the metric system and make use of metric units for length, area, volume, capacity, mass and temperature. ● Develop an understanding of the language of algebra and be able to identify, simplify, and evaluate algebraic expressions. ● Apply algebraic operations in solving equations and formulas and write an algebraic expression for a given situation and solve it. ● Set up and use proportions (direct and indirect) to solve applied problems. ● Identify basic plane and solid geometric figures; make use of angle measurement, calculate perimeter and area of various polygons including quadrilaterals, triangles and circles. ● Become familiar with solid figures and be able to compute surface area and volume of various types of prisms, pyramids, cylinders, cones and spheres using a formula sheet. ● Be exposed to and demonstrate basic graphical representation and interpretation of data. Read and construct bar, line, and circle graphs, as well as plot and interpret graphs of continuous data from the equation or formula of technical information. ● Identify and label various triangle types, make use of angle measurement, the Pythagorean Theorem, and trigonometric ratios. ● Solve for unknown side lengths and unknown angles in right triangles.
MEDA 101 Medical Vocabulary I 3 Credits	● Build and analyze medical terms using correct spelling, definition, pronunciation, application, and formation. ● Define stand-alone terms as they relate to anatomy, physiology and medicine. ● Provide complete terms for common abbreviations and symbols used in health care. ● Utilize assigned resources, including a cyclopedic medical dictionary. ● Identify basic structural levels of the body.

	● Describe major systems of the body in terms of their basic anatomical and physiological actions. ● Match definitions and names for common diseases, and match them with associated body systems. ● Identify behaviors and actions for each body system that promote health, and aid in disease prevention. ● List and define the three primary categories of human development. ● Recognize characteristics for each stage of psychosocial development according to Erik Erikson.
MEDA 102 Medical Vocabulary II 3 Credits	● Build and analyze medical terms using correct spelling, definition, pronunciation, application, and formation. ● Define stand-alone terms as they relate to anatomy, physiology and medicine. ● Provide complete terms for common abbreviations and symbols used in health care. ● Utilize assigned resources, including a cyclopedic medical dictionary. ● Identify basic structural levels of the body. ● Describe major systems of the body in terms of their basic anatomical and physiological actions. ● Match definitions and names for common diseases, and match them with associated body systems. ● Identify behaviors and actions for each body system that promote health, and aid in disease prevention.
MEDA 120 Survey of Human A & P 5 Credits	● Identify the different organ systems of the body. ● Name the different organ systems of the body. ● Explain the anatomy and physiology of each organ system. ● Explain the pathophysiology associated with each organ system. ● Describe the interrelations among the organ systems. ● Describe the relationship of each organ system to homeostasis.
MEDA 122 Law & Ethics for Medical Office 3 Credits	● Identify the type of credentialing for healthcare professionals. ● Explain the types of tasks that are in the scope of practice for a medical assistant. ● Describe elements of criminal law, civil law and standards of care. ● Identify the issues of negligence and liability. ● Describe the factors involved in the release of patient information. ● Explain the issues involved with employment law. ● Outline confidentiality in various specialty cases. ● Discuss bioethical cases. ● Identify the ideas expressed in the Patient Bill of Rights. ● Explain various confidentiality issues as related to health care. ● Discuss matters of professionalism in the context of medical law and ethics. ● Explain details of Washington law as it relates to Medical Assistants.
MFG 100 Foundational Skills for the Trades 3 Credits	● Write lecture notes. ● Develop a time management plan. ● Use textbooks, manuals, and service information as learning tools. ● Listen and communicate in individual and collaborative learning environments. ● Explain how to access campus services and resources such as the library, the Learning Commons, the Career Center, and Counseling Services. ● Identify educational and career options that are of interest. ● Identify industry related terminology, tools and common fasteners.

	● Discuss the use of computers in a college and work environment. ● Demonstrate safe use of basic hand and power tools, including how to store and care for them. ● Demonstrate the use of measuring tools ranging from tape measure to precision bore gauges.
MFG 105 Industrial Safety 3 Credits	● Identify the major purpose and focus of the OSHAct and WISHA. ● Identify the major functions of OSHA and Washington Labor and Industries. ● Identify specific work areas in common industrial environments subject to OSHA/L & I regulations and inspection. ● Describe various types of personal protective equipment used in industrial environments. ● Identify common types of hazards found in industrial environments. ● Identify appropriate control measures for various types of hazards. ● Describe safe material handling practices. ● Recognize specific hazards associated with electrical energy. ● Describe appropriate responses to emergencies involving electrical equipment. ● Demonstrate appropriate lock-out/tag-out procedures applicable to various types of energy systems. ● Recognize specific hazards related to mechanical systems and machine tools. ● Recognize various types of fire hazards and appropriate responses to fire emergencies. ● Utilize MSDS sheets to identify appropriate controls for chemicals and other hazardous materials. ● Identify common safety inspection procedures and practices.
MFG 120 Quality Assurance 4 Credits	● Describe and apply the fundamentals and principles of Quality Assurance. ● Describe and apply several of the implementation plans to achieve quality in business and industry. ● Describe and demonstrate the quantitative tools of descriptive and inferential statistics. ● Use the quantitative tools of standard deviation, histograms, distribution curves, and control charts for quality control. ● Use the concepts and tools of Statistical Process Control (SPC) to insure product quality in business and industrial settings.
MFG 130 Materials Science 5 Credits	● Identify the basic structure of matter, and explain how atomic structure affects the properties of materials. ● List and describe the criteria used for matching materials to product specifications. ● Classify materials by composition and properties. ● Compare and contrast the behavior, properties, and characteristics of natural and engineered materials used in contemporary industry and society. ● Identify common destructive and nondestructive testing methods used in industry to assure appropriate use of material for operational conditions.
MFG 140 Applied Hydraulics 4 Credits	● Identify basic principles of hydraulics, fluids, power, controls, pressures and circuits. ● Identify the principles of industrial hydraulic applications. ● Observe proper safety procedures. ● Apply knowledge of math and physics to understand hydraulics.

	● Think inductively and deductively about hydraulic problems. ● Practice good work ethics.
MFG 230 Computer Integrated Manufacturing 4 Credits	● Know the fundamentals of Computer Integrated Manufacturing. ● Know how CIM interfaces with all aspects of manufacturing. ● Create CAD drawings using manufacturing software. ● Design parts and simulate the manufacturing process. ● Create part path programs to manufacture dimensionally correct machine parts.
PMFG 110 Industrial and Predictive Maintenance Fundamentals 5 Credits	● Describe the jobs and tasks commonly carried out by maintenance personnel in a manufacturing enterprise. ● Identify, describe, and demonstrate the proper use of various types of hand tools. dentify, measure, and explain applications for various types of fasteners, including when the use of lock-tight and anti-seize compounds is appropriate. ● Identify various types of bearings and describe common applications. ● Identify the basic components and designs of mechanical seals. ● Identify sealing points and applications in which packing is installed to control process leakage as well as the types of materials commonly used to make seal faces and elastomers. ● List various types of lubricants and their common applications. ● Define viscosity, friction, and other common lubrication terminology. ● Explain ring, bath, splash, and constant level lubrication systems operate and common applications of each. ● Identify common industrial components requiring maintenance, including pumps, valves, motors, drive mechanisms, compressors, and HVAC equipment. ● Utilize various types of micrometers and calipers to accurately measure inside, outside, and depth measurements on a variety of industrial parts. ● Utilize thickness gauges, telescopic gauges, and dial indicators, to measure various dimensions and clearances. ● Use ANSI symbols to draw sketches and layouts. ● Describe basic safety practices critical to industrial and predictive maintenance tasks. ● Identify which situations require energy lock-out and demonstrate proper lock-out/tag-out procedures in both electrical and mechanical situations. ● Describe basic considerations in shop and equipment layout. ● Describe basic approaches to troubleshooting mechanical systems.
PMFG 150 Electrical and Electronic Fundamentals 6 Credits	● Recall and utilize electrical safety practices. ● Describe the basic principles of electricity. ● Describe basic electrical circuit concepts using standard terms and symbols. ● Explain the principles of common electrical devices and circuit measurement instruments. ● Solve problems in DC circuit analysis. ● Construct and troubleshoot series, parallel and combinational circuits. ● Use meters to measure electrical quantities. ● Describe the difference between magnetic and nonmagnetic materials and magnetic field strength.

	● Describe the basic laws of magnetism. ● Determine magnetic field strength and direction around magnets, current carrying conductors and coils. ● Define the terms: permeability, retentivity, saturation, magnetic circuit, flux density, hysteresis, reluctance, residual magnetism, magnetomotive force, magnetizing force, coercive force. ● Describe AC and DC generation. ● Measure AC circuit levels; construct AC circuits from schematic designs. ● Define the following terms relating to AC waveforms: alternating current, cycle, frequency, peak (maximum) value, instantaneous value, average value, alteration, amplitude, period, peak-to-peak value, effective (RMS) value. ● Solve problems for frequency, speed, and the number of field poles for an alternator. ● Use the oscilloscope to measure period and amplitude of an AC sine wave. ● Describe the basic principles and construction of inductors and capacitors. ● Analyze RCL networks in AC & DC circuits using universal exponential curves. ● Describe the relationships between phase, line voltage and currents in a Wye and Delta 3-phase system. ● Describe the basic principles of operation and constructional features for single-phase and three-phase transformers. ● Identify the basic function of transistors, diodes, and other basic electronic devices.
PMFG 151 Process Control Equipment 5 Credits	● Identify and describe the function of various types of process control equipment. ● Describe strategies for controlling continuous flow processes in an industrial environment. ● Identify standard symbols for common devices in Process and Instrumentation Diagrams (P&IDs). ● Interpret P&IDs. ● Draw simple process control circuits using standard equipment symbols. ● Interpret operating instructions for a process control pilot plant. ● Operate pilot plant or simulated control systems measuring temperature, pressure, level and flow control. ● Troubleshoot process control equipment in a lab or simulation environment. ● Work cooperatively as a team member to operate the process control pilot plant laboratory or simulator safely and in an environmentally responsible manner.
PMFG 154 Fundamentals of Instrumentation and PLCs 5 Credits	● Discuss the history of programmable logic control systems from inception to current practice. ● Define process control terminology. ● Identify components of a compressed air system. ● Apply fundamental electrical and pneumatic concepts to process control. ● Interpret a piping and instrumentation diagram (P & ID). ● Develop basic ladder logic programs. ● Design a simple process control system. ● Apply current-to-pressure and its inverse to industrial applications.

	● Discuss industrial safety as it applies to instrumentation.
PMFG 201 Electrical Control Equipment 3 Credits	● Remove fuses, perform continuity checks, and re-install fuses. ● Select and install circuit breakers. ● Perform routine maintenance on a circuit breaker panel. ● Test the operation of a ground fault circuit breaker. ● Interpret test results using a characteristic tripping curve. ● Adjust lever-activated limit switches, torque switches, and geared limit switches as well as be able to troubleshoot typical limit switch problems. ● Properly perform the procedure for verifying that a circuit is de-energized. ● Electrically check push button and rotary switches. ● Remove and install a push button switch contact block and an overload relay. ● Assess a coil's condition as well as determine the cause of coil failure. ● Perform a mechanical check on a magnetic motor starter. ● Check the resistance of the coil on a magnetic motor starter. ● Perform continuity checks on the contacts in a magnetic motor starter. ● Identify damaged parts. ● Check mechanical interlocks in a reversing magnetic motor starter. ● Check the operation of the electrical interlock in a reversing magnetic motor starter. ● Develop a logical and systematic strategy for troubleshooting a circuit. ● Obtain all necessary troubleshooting information. ● Verify problem symptoms by performing electrical and/or mechanical operational checks. ● Isolate the problem. ● Replace all defective parts. ● Check the operation of replacement parts.
PMFG 202 Electric Motors 2 Credits	● Identify the components and principles of operation for the major types of AC motors. ● Measure winding insulation resistance. ● Measure winding resistance in AC motors. ● Inspect and clean end bells and rotors. ● Reinstall bearings. ● Reassemble an AC motor as well as perform operational tests on it. ● Perform routine maintenance on the brush assembly components and slip rings of an AC wound rotor induction motor as well as perform periodic checks to determine the operating condition of the variable resistor of an AC wound rotor induction motor. ● Identify the components and principles of operation of a DC motor. ● Inspect a commutator for wear patterns. ● Undercut a commutator. ● Seat the brushes of a DC motor.
PMFG 210 Advanced Industrial Maintenance 5 Credits	● Define predictive maintenance and differentiate it from other approaches such as run-to-failure and preventive maintenance. ● Describe the benefits of a predictive maintenance program. ● Describe some basic guidelines for a successful predictive maintenance program. ● Identify and describe the functions of the basic components of a centrifugal pump. ● Recognize and describe the causes of excessive leakage or temperature.

	● Explain how pressure, flow rate, and temperature are affected by the system in which a pump operates. ● Recognize and discuss causes of symptoms of loss of capacity/head in a pump. ● Demonstrate how to inspect pump components and take critical measurements. ● Describe how to disassemble and reassemble a pump. ● Discuss impeller clearance and correction if needed. ● Identify the parts of a gate valve and describe their functions. ● Inspect a valve and make adjustments to stop leakage. ● Remove, disassemble, and reassemble a gate valve. ● Use appropriate instruments to measure critical gate valve dimensions. ● Perform a run-out to determine if a stem is bent. ● Lap a disc and perform a contact check of disc mating surfaces. ● Describe how equipment vibration can provide an indication of equipment condition. ● Describe how impurities in equipment lubricant can provide an indication of the condition of the components being lubricated. ● Describe how trends reflected in equipment records can provide an indication of equipment condition. ● Identify two measures of vibration amplitude and the units of measurements used. ● Identify the points on a bearing where horizontal, vertical, and axial readings would be taken. ● Use a severity chart to get an indication of machine condition. ● Define amplitude and frequency. ● Identify the function of three filter settings on a vibration analyzer. ● Recognize the characteristics of vibration produced by conditions such as unbalance, misalignment, mechanical looseness, worn gears, and anti-friction bearing. ● Take an oil sample at a sampling valve and reservoir. ● Determine where to take a sample to check the condition of a particular component. ● Use operating data to establish trends in machine condition. ● Identify increasing, decreasing, and flat trends. ● Compare trends using different data from the same machine. ● Describe various types of shaft coupling devices and common applications. ● Demonstrate techniques for aligning equipment shafts.
TECH 100: Advanced Principles of Technology 5 Credits	● Solve mathematical and conceptual review problems related to force, work, rate, and resistance in mechanical, fluid, electrical, and thermal energy systems. ● Define the terms force, work, rate, resistance, energy, power, and force transformers. ● Describe the nature of energy in mechanical, fluid, electrical, and thermal systems. ● Describe the terms "potential" and "kinetic energy." ● Describe the relationship between potential, kinetic, and heat energy in the conservation of energy law. ● Describe the relationship between work and energy. ● Identify appropriate SI and English unit in mechanical, fluid, electrical, and thermal systems. ● Measure energy in mechanical, fluid, electrical and thermal systems.

	● Identify workplace applications where technicians measure or control energy. ● Describe what is meant by power in general, as well as in mechanical, fluid, electrical, and thermal systems. ● Explain how thermal power and thermal rate are the same. ● Explain how power in each energy system relates to the unifying principle of work divided by time. ● Explain why power also can be described in terms of a "force" times a rate for mechanical, electrical, fluid, and thermal systems. ● Measure input power, output power, and efficiency in mechanical, fluid and electrical systems. ● Identify workplace applications where these technicians measure or control power. ● Describe force transformers in general, as well as in mechanical, fluid, and electrical systems. ● Explain the unifying principle behind force transformers in mechanical, fluid, and electrical systems. ● Explain the unifying principle behind force transformers in mechanical, fluid, and electrical systems. ● List examples of force transformers in mechanical, fluid, and electrical systems. ● Measure the ideal and actual mechanical/electrical advantage of various force transformers in mechanical, fluid, and electrical systems. ● Calculate the efficiency of various types of force transformers in mechanical, fluid and electrical systems.
WELD 125 OFW-A - Oxy/Acetylene Welding with RG45 2 Credits	● Apply industry standard safety guidelines. ● Safely operate equipment and tools used in welding, cutting, and fabricating. ● Perform entry-level welding competency in OFW-A with RG45. ● Demonstrate cutting competency in OFC-A, CAC-A, and PAC. ● Perform welding activities following written and verbal instructions. ● Complete tasks within a given time frame. ● Recognize the effect of attitude and work ethic on job performance. ● Analyze problems to derive solutions that use appropriate welding techniques. ● Apply mathematical information to perform welding tasks.
WELD 131 SMAW - Stick Welding with E7018 2 Credits	● Apply industry standard safety guidelines. ● Safely operate equipment and tools used in welding, cutting, and fabricating. ● Perform entry-level welding competency in SMAW with E7018. ● Demonstrate cutting competency in OFC-A and CAC-A. ● Perform welding activities following written and verbal instructions. ● Complete tasks within a given time frame. ● Recognize the effect of attitude and work ethic on job performance. ● Analyze problems to derive solutions that use appropriate welding techniques. ● Apply mathematical information to perform welding tasks.
WELD 132 SMAW - Stick Welding with E6010 2 Credits	● Apply industry standard safety guidelines. ● Safely operate equipment and tools used in welding, cutting, and fabricating. ● Perform entry-level welding competency in SMAW with E6010. ● Demonstrate cutting competency in OFC-A, CAC-A, and PAC. ● Perform welding activities following written and verbal instructions. ● Complete tasks within a given time frame.

	● Recognize the effect of attitude and work ethic on job performance. ● Analyze problems to derive solutions that use appropriate welding techniques. ● Apply mathematical information to perform welding tasks.
WELD 241 FCAW-G - Dual Shield Wire Feed Welding with E71T-1 2 Credits	● Apply industry standard safety guidelines. ● Safely operate equipment and tools used in welding, cutting, and fabricating ● Covers the fundamentals of wire feed welding of mild steel with E71T-1 dual shield 0.045" electrode wire in all welding positions for numerous weld joints. ● Explores key welding and fitting techniques through project-based print reading ● Covers selected cutting processes and equipment used in the metal trades. ● Perform welding activities following written and verbal instructions. Complete tasks within a given time frame. ● Recognize the effect of attitude and work ethic on job performance. ● Analyze problems to derive solutions that use appropriate welding techniques. ● Apply mathematical information to perform welding tasks.