COURSE INFORMATION

- Career and Technical courses have alphabetical prefixes and generally are numbered 2.000 through 8.999.
- Courses with 100 and 200 numbers are usually transferable to four-year institutions.
- Courses numbered 0.100 to 0.999 do not apply toward LBCC degree and certificate programs.
- Many departments offer professional/industry related courses not listed in this catalog. Please contact the appropriate department for a list and schedule of these courses, workshops and seminars.

Courses marked with the symbols below may be applied toward fulfilling the general education requirements for the Associate of General Studies degree. For lists of classes that fulfill general education requirements for other degrees offered at LBCC, see the "Graduation Requirements" section of this catalog.

- ➢ Humanities/Art
- ● Math/Science
- ■ Social Sciences

AA: APPLIED ART (GRAPHIC DESIGN)

Courses with the AA prefix are career and technical courses that have a primary purpose of meeting requirements for the Associate of Applied Science degree. Four-year institutions may or may not accept them for transfer credit.

AA 198 Independent Studies
(2–6 class hrs/wk, 1–4 cr) F/W/Sp
Individual instruction in advanced problems relevant to the student's interests and needs. Prerequisite: instructor's approval.

AA 221 Graphic Design I
(6 class hrs/wk, 4 cr) F
Introduction to graphic design. Examines visual communication through the application of the elements and principles of art. Studies static vs. dynamic, visual centering, design systems, metamorphosis and continuums. Instills critical analysis and good design judgment. Prerequisites: Submission of portfolio or instructor's approval.

AA 222 Graphic Design II
(6 class hrs/wk, 4 cr) W
Studies publication design. Includes examination of formula vs. format, direct mail, poster, magazine and book design. Environmental implications are discussed. Teamwork and interaction are stressed. Instills critical analysis and good design judgment. Prerequisite: AA 221 Graphic Design I.

AA 223 Graphic Design III
(6 class hrs/wk, 4 cr) Sp
Studies corporate mark design, the development of symbols, logos, design programs and identity systems. Examines the design's adaptability, application, practicality and integrity. Environmental issues are discussed. Teamwork and interaction are stressed. Instills critical analysis, process and good design judgment. Prerequisite: AA 222 Graphic Design II.

AA 224 Typographical Design I
(6 class hrs/wk, 4 cr) W/Sp
Introduction to letterforms. Develops a fundamental awareness of type and typographic design. Studies the evolution, art and vocabulary of typography; hand-built letterforms; and designing with type. Emphasizes typography as a working tool. Prerequisites: GA 3.153 Digital Illustration I, GA 3.156 Digital Page Layout I, GA 3.157 Digital Image Manipulation I.

AA 225 Packaging and 3-D Design
(6 class hrs/wk, 4 cr) W
Introduction to design, display and merchandising of three-dimensional marketing solutions. Stresses suitability of concept, design and color as applied to various products. Materials and methods of printing, cutting, folding and assembly are explored for tactile and visual effect. Environmental issues are discussed. Good client/designer relationships are stressed. Prerequisites: AA 224 Typographical Design; AA 237 Illustration I; GA 3.155 Digital Illustration III; GA 3.168 Digital Page Layout III; GA 3.169 Digital Image Manipulation III.

AA 226 Typographical Design II
(6 class hrs/wk, 4 cr) F
Continues the study, use and design of letterforms. Emphasizes creating original type variations and form manipulation. Prerequisites: AA 224 Typographical Design I; GA 3.155 Digital Illustration III; GA 3.168 Digital Page Layout III; GA 3.169 Digital Image Manipulation III.

AA 228 Portfolio Preparation: Professional Practices
(6 class hrs/wk, 4 cr) Sp
Emphasizes reevaluation of previously produced projects; organization and production of the business card, business stationery, résumé, envelope, self-promotional and comprehensive portfolio. Covers current job opportunities; methods in merchandising job talents; action before, during and after the interview; business practices and ethics. Students present their professional portfolios to public at Portfolio Presentations and in a more personal setting at the reception that follows. Prerequisites: AA 222 Graphic Design II; AA 226 Typographical Design II. Corequisite: AA 223 Graphic Design III.

AA 237 Illustration I
(6 class hrs/wk, 4 cr) F
Explores and develops skills in the use of various tools, materials and techniques. Increases student awareness of illustrative possibilities and processes. Pen and ink, graphite and ink wash are included. Prerequisites: GA 3.153 Digital Illustration I, GA 3.156 Digital Page Layout I, GA 3.157 Digital Image Manipulation I Corequisite: ART 131 Drawing I.

AA 238 Illustration II
(6 class hrs/wk, 4 cr) W
Explores rendering with markers. Moves from an exercise, process and technique orientation to product rendering and ad development. Prerequisite: AA 237 Illustration I. Corequisite: ART 132 Drawing II

AA 239 Illustration III
(6 class hrs/wk, 4 cr) Sp
Explores further possibilities in illustration using soft pastel and colored pencil. Stresses conceptual development of illustration dealing with written material. Prerequisite: AA 238 Illustration II. Corequisite: ART 234 Figure Drawing.

AA 280 CWE Graphics
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to graphics. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar.
Note: Credits are based on identified objectives and number of hours worked. Prerequisite: GA 3.157 Digital Image Manipulation I, GA 3.156 Digital Page Layout I, and CWE coordinator's approval.

AG: AGRICULTURE

AG 111 Computers in Agriculture
(4 class hrs/wk, 3 cr) W/Sp
Agricultural examples and problems are utilized as a basis for the material in this course. Provides hands-on experience in the areas of word processing, spreadsheets, PowerPoint and Web site development.

AG 250 Irrigation System Design
(4 class hrs/wk, 3 cr) F/W
Designing drip, low pressure, and sprinkler irrigation systems with an emphasis in horticultural and field crop applications from pump to output nozzle.

AG 280A CWE Agriculture
(6–42 class hrs/wk, 2–14 cr) As needed
Designed to give students practical experience in supervised employment related to agriculture. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

AG 280B CWE Animal Technology
(6–42 class hrs/wk, 2–14 cr) As needed
Designed to give students practical experience in supervised employment related to animal technology. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

AG 280C CWE Horticulture
(6–42 class hrs/wk, 2–14 cr) As needed
Designed to give students practical experience in supervised employment related to horticulture. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

AG 8.130 Pesticide Safety
(3 class hrs/wk, 3 cr) W
Covers background information in use of herbicides, insecticides, fungicides and other pesticides. Types of materials, safety in handling, storage and method of application are emphasized. Attention also is given to keeping current with changes in pesticide record-keeping procedures.

AG 8.140 BioEnergy Feedstock Production
(3 class hrs/wk, 3 cr) W
Introduces students to the feedstocks that are used in the production of biofuels, including temperate and tropical climate crops and grasses, wood residues and animal wastes. The principles of sustainable agriculture and its implications to ecologically sound and socially responsible biofuel feedstock production are discussed. Also covered are options for on-farm biofuel manufacturing.

AG 8.141 Principles of BioEnergy
(6 class hrs/wk, 4 cr) F
Provides an overview of the biofuel industry, the major types of biofuels, and the implications of an emerging biofuel energy sector. The social, economical and environmental sustainability of biofuel production are discussed throughout the course. Students will learn the various methods of manufacturing biofuels in the laboratory, on the farm and on a commercial scale. Fundamental concepts in biofuel engineering and biofuel chemistry are covered. Field trips include farm-scale and industrial biofuels operations in Oregon.

AG 8.142 Industrial BioEnergy Production and Plant Operation
(3 class hrs/wk, 3 cr) Sp
Examines the operation of biodiesel and ethanol production systems for large scale and small scale applications. Special focus will be on the maintenance, troubleshooting and repair of these systems. Included is sustainability planning for such operations.

AH: ALLIED HEALTH

AH 5.440 Interprofessional Education
(1 class hrs/wk, 1 cr)
Introduces students to the basic concepts and practices needed to collaborate effectively. The content of these courses will complement the non-technical competencies that already occur in each program's curriculum. In the Interprofessional Education (IPE) courses, students will learn about the roles and responsibilities of various healthcare professions. They also will learn and practice the skills that enhance collaborative practice. Prerequisite: Enrolled in one of the following programs: Occupational Therapy Assistant, Diagnostic Imaging, Nursing, Medical Assisting.

ANS: ANIMAL SCIENCE

ANS 121 Introduction to Animal Science
● *(5 class hrs/wk, 4 cr) F/Sp*
Examines body systems of the food and fiber species and the interaction of these systems. Introduces the student to various phases of the livestock industry, including terminology, production practices, marketing and selection techniques. Students are expected to build communication skills through weekly lab reports and class presentations. Lab sessions are designed for practical experience with livestock. Emphasis is placed on the nutritional, reproductive and physical needs of the animals. This course includes a laboratory component.

ANS 207 Careers in Animal Agriculture
(1 class hr/wk 1 cr) W
Explores career opportunities in animal science. Includes guest lecturers from various fields of animal agriculture as well as an emphasis on résumé writing and job interviewing.

ANS 210 Feeds and Feed Processing
(5 class hrs/wk, 4 cr) F
Covers basic animal nutrition, including digestive systems and nutrients. Studies methods of determining feed values, types of feed, feed characteristics, nutritional requirements and composition, methods of feeding and feed processing.

ANS 211 Applied Animal Nutrition
(4 class hrs/wk, 3 cr) W
Introduces formulating and analyzing rations for livestock, balancing nutritional needs and choice of ingredients in relation to cost and suitability. Includes economics of livestock feeding and performance indicators. Prerequisite: ANS 210 Feeds and Feed Processing.

ANS 215 Applied Beef Production
(5 class hrs/wk, 4 cr) F
Covers fundamentals of modern beef production and management, including cattle breeds, mating systems and reproduction, nutrition, marketing, production testing, diseases and parasites, and other management practices. Particular emphasis is on developing beef husbandry skills.

ANS 216A Applied Sheep Production
(5 class hrs/wk, 4 cr) W
Covers fundamentals of modern sheep production, including sheep breeds, industry segments, nutrition, reproduction, diseases and parasites, wool evaluation, marketing and modern management practices. Note: Course offered alternate years only. Offered Winter 2011.

ANS 216B Applied Swine Production
(5 class hrs/wk, 4 cr) W
Covers fundamentals of modern swine production, including swine breeds, marketing, reproduction, nutrition, production testing, diseases and parasites, production problems, and environmental concerns. Note: Course offered alternate years only. Offered Winter 2012.

ANS 220 Introductory Horse Science
(5 class hrs/wk, 4 cr) F
Basic course in commercial horse production and management. Covers breeds, breeding systems, physiology, nutrition, reproduction and diseases. Also develops basic skills in handling, foot care, feeding, selection and health management.

ANS 221 Horse Conformation and Judging
(5 class hrs/wk, 2 cr) Sp
Teaches students practical skills in four specific areas of horse science: anatomy, foot and leg care, fitting and showing, horse conformation judging, and assessing conformation for performance. Recognizing common unsoundnesses and blemishes is also covered.

ANS 222 Young Horse Training
(6 class hrs/wk, 2 cr) F
Provides hands-on training. The student is assigned a young horse to train for the term. The training consists of halter breaking, leading, sacking, longeing, trailer loading and handling the feet. Saddling, bitting, ground driving and early stages of riding are taught, as well as grooming, safety and use of equipment.

ANS 223 Equine Marketing
(2 class hrs/wk, 2 cr) W
Introduces the practical concepts of equine marketing. Emphasizes assessing the market, targeting potential buyers, and preparing and presenting the product. Business law, as it relates to equine marketing, is discussed. Through practicing interviewing skills and writing a résumé, students learn to "market themselves."

ANS 227 Artificial Insemination
(5 class hrs/wk, 4 cr) Sp
Includes instruction on reproductive organs, hormones, heat diagnosis, semen collection, insemination techniques, semen evaluation, pregnancy testing, freezing and dilution methods. Hands-on experience is stressed. Note: Recommended for second-year students.

ANS 231 Livestock Evaluation
(5 class hrs/wk, 3 cr) Sp
Introduces criteria and principles in the physical evaluation of beef, sheep and swine. Emphasizes correctness of body type, relation of type to production, market standards, soundness and body parts. Extensive time is spent on applying techniques in evaluating live animals.

ANS 278 Genetic Improvement of Livestock
(5 class hrs/wk, 3 cr) W
Introduces basic, practical concepts of improving livestock through a variety of genetic programs, including genetic possibilities, utilizing heritability for production gains, inbreeding coefficient, mating systems, genetic predictors and improvement programs. Corequisite: MTH 065 Elementary Algebra.

ANTH: ANTHROPOLOGY

ANTH 103 Introduction to Cultural Anthropology
■ *(3 class hrs/wk, 3 cr) F/W/Sp*
Surveys the field of cultural anthropology and its focus — studying human behavior and culture. Introduces a methodology for studying human sociocultural adaptations. Includes the topics of major cross-cultural studies with a focus on language, economics, marriage, kinship, gender, political organization, stratification, and spiritual belief systems. Examines traditional and contemporary practices, the processes of culture change, and the application of cultural anthropology to practical society problems.

ANTH 198 Research Topics
(1 class hr/wk, 1 cr) As needed
Offers topics of study in anthropology with individual research and/or field study. Prerequisite: WR 121 English Composition.

ANTH 210 Comparative Cultures
■ *(3 class hrs/wk, 3 cr) As needed*
Examines the ethnographic process anthropologists use to study other cultures, the process of comparing two or more cultures in an ethnologic context, and the development of cultures over time to be what they are today. A methodology for engaging in culturally relative dialogue is introduced and then emphasized in all learning activities. Recommended: College-level reading and writing skills.

ANTH 230 Time Travelers
■ *(3 class hrs/wk, 3 cr) F/W*
Introduction to how the past is studied by archaeologists. The history of archaeology, archaeological theories, and archaeological methods will be discussed and explored in multiple contexts, emphasizing visual and hands-on learning. Recommended: College-level reading and writing skills.

ANTH 232 Native North Americans
■ *(3 class hrs/wk, 3 cr) F/Sp*
Focuses on Native American cultures and their ancestors in prehistoric, historic, and contemporary contexts. Anthropological evidence, including archaeology and ethnography, and indigenous evidence, including customs and oral histories and traditions, are used to create holistic perspectives about both early Native American cultures and cultures today. Later changes resulting from contact, westernization, and assimilation are investigated. Recommended: College-level reading and writing skills.

ANTH 280 CWE Anthropology/Archaeology
(6–42 class hrs/wk, 2–14 cr) As needed
Gives students practical experience in supervised employment related to anthropology/archaeology. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Must have CWE coordinator's approval before registering.

APR: APPRENTICESHIP

Courses with the APR prefix are accepted for transfer to the Oregon Institute of Technology (OIT). Other four-year institutions may or may not accept them for transfer credit.

APR 101 Introduction to Electricity and Circuit Components
(6 class hrs/wk, 6 cr) F
Introductory electricity course, emphasizing electron theory, electrical terminology, magnetism, and electro-magnetism. Ohm's Law will be introduced and applied to series, parallel, and series-parallel circuits. A study of AC circuits and the associated reactive components (capacitors and inductors) will necessitate an introduction to trigonometry and vector analysis. Prerequisite: Employment in the trade and MTH 060, or instructor's approval.

APR 102 Alternating Current Components and Uses
(6 class hrs/wk, 6 cr) W
Introduces students to the practical application of resistors, capacitors, inductors and transformers to AC electrical circuits. AC resonant circuits, including RL, RC, and RLC will be studied in both series and parallel configurations. The components involved with the distribution of AC power as well as lighting, heating and wiring applications will be covered. Students will learn troubleshooting skills and proper use of test equipment as they apply to AC circuits. Prerequisite: Employment in the trade and APR 101, or instructor's approval.

APR 103 Electric Generators, Motors and Controls
(6 class hrs/wk, 6 cr) Sp
Introduces students to AC and DC generators and alternators. The study of the theory, design and construction of both single-phase and three-phase generators and alternators is included. Students are also introduced to semiconductor control devices and PLC programming. Prerequisite: Employment in the trade and APR 102, or instructor's approval.

APR 121 Introduction to the Limited Energy Trade
(4 class hrs/wk, 4 cr)
This is the first term of coursework designed for apprentices studying to become Limited Energy Technicians. Topics covered this term include an introduction to the limited energy trade, job site and tool safety, low-voltage cabling, craft-related mathematics, and conduit bending. Industry codes, standards and agencies will also be discussed. Prerequisite: MTH 060 Introduction to Algebra or better.

APR 122 Fundamentals of Electricity and Electronics
(4 class hrs/wk, 4 cr) W
This class is designed for apprentices working/studying to become Limited Energy Technicians, but is open to anyone desiring an introduction to Electricity and Electronics. Topics for this term include: Basic DC and AC Circuit analysis, Semiconductors, ICs and Digital Logic, Switching Devices, and Blueprint Reading. Using a DMM to safely test voltage, current and resistance will be emphasized. The National Electrical Code (NEC) as it relates to effective and safe implementation of low-voltage circuits will be introduced.

APR 123 Electrical Test Equipment
(4 class hrs/wk, 4 cr) Sp
This class is designed for apprentices working/studying to become Limited Energy Technicians. Topics for this term include: Electrical Test Equipment, Power Quality, and Proper Grounding and Cable Termination. Effective and safe use of various trade-related test equipment as well as the National Electrical Code (NEC) requirements for safe grounding and cable termination will be emphasized.

APR 201 Electric Motors
(6 class hrs/wk, 6 cr) F
Introduces students to various aspects of electric motors including types and applications, factors governing proper selection, effective protection and troubleshooting. Additional topics include hand bending of conduit, correct strapping and proper wire selection. Emphasis is on effective troubleshooting, including human relations and customer service during maintenance, troubleshooting and repair. Prerequisite: Employment in the trade and APR 103, or instructor's approval.

APR 202 Electric Motor Controls
(6 class hrs/wk, 6 cr) W
Provides an introduction to the design of control circuits and the electrical components that comprise these circuits. Students will design, troubleshoot and demonstrate a motor control training circuit in the context of a team environment. Prerequisite: Successful completion of all previous coursework.

APR 203 Motor Circuit Design
(3 class hrs/wk, 3 cr) Sp
Familiarizes the student with the National Electrical Code (NEC) as it relates to motors, motor circuits, and controllers (Article 430). Prerequisite: Successful completion of all previous coursework.

APR 204 Basic Welding for Electricians
(4 class hrs/wk, 2 cr)
An introductory course stressing safety and equipment familiarization with lab exercises in basic oxygen fuel welding and cutting. A basic introduction and use of different electric arc welding processes. Includes technical information in the related subjects.

APR 205 Introduction to Programmable Logic Controllers
(6 class hrs/wk, 6 cr) F
A hands-on introduction to programmable logic controllers (PLCs). Students will learn to convert common industrial control circuits to PLC ladder logic as well as designing programs from narrative description. Emphasis is given to interfacing the PLC with a selection of electro-pneumatic control devices. A systemic approach to testing and troubleshooting PLC programs will also be covered. Prerequisite: Successful completion of all previous coursework or instructor's approval.

APR 206 Advanced Programmable Logic Controllers
(6 class hrs/wk, 6 cr) W
Presents advanced concepts associated with programmable logic controllers (PLCs). Students will expand upon prior programming experience. Programming topics include creating subroutines, cascading timers and counters, and incremental encoder-counter applications. Implementing effective program control, data manipulation, math and sequencer and shift instructions will also be covered. Students will learn proper PLC installation practices, preventive maintenance and advanced troubleshooting concepts. Special emphasis will be given to Process Control and Data Acquisition systems as well as computer-controlled machines and processes. Prerequisite: Successful completion of APR 205 Introduction to Programmable Logic Controllers or instructor's approval.

APR 207 Instrumentation and Industrial Process Control
(6 class hrs/wk, 6 cr) Sp
Provides an introduction to Instrumentation and Industrial Process Control. Fundamentals of automated control loops and control loop dynamics will be presented in the context of industrial control variables such as pressure, level, flow, and temperature. Prerequisite: Successful completion of APR 205 and APR 206, or instructor's approval.

APR 208 Industrial Electrical Code I
(6 class hrs/wk, 6 cr) F
Designed for students preparing to take examinations based on The National Electrical Code (NEC). The course includes a comprehensive study of the sections of the NEC relating to "wiring and protection" and "wiring methods and materials." Strategies for finding and applying information found in these sections to real life situations are emphasized.

APR 209 Industrial Electrical Code IA
(3 class hrs/wk, 3 cr) F
Designed for students preparing to take examinations based on The National Electrical Code (NEC). The course includes a comprehensive study of the sections of the NEC relating to "Wiring and protection" and "Wiring Methods and Materials." Strategies for finding and applying information found in these sections to real life situations are emphasized.

APR 210 Industrial Electrical Code II
(6 class hrs/wk, 6 cr) W
Designed for students preparing to take examinations based on the National Electrical Code (NEC). The course includes a comprehensive study of the sections of the NEC relating to "Equipment for General Use" and "Special Occupancies." Strategies for finding and applying information found in these sections to real life situations are emphasized.

APR 211 Industrial Electrical Code IIA
(3 class hrs/wk, 3 cr) W
Designed for students preparing to take examinations based on the National Electrical Code (NEC). The course includes a comprehensive study of the sections of the NEC relating to "Equipment for General Use" and "Special Occupancies." Strategies for finding and applying information found in these sections to real life situations are emphasized.

APR 212 Industrial Electrical Code III
(6 class hrs/wk, 6 cr) Sp
Designed for students preparing to take examinations based on the National Electrical Code (NEC). The course includes a comprehensive study of the chapters of the NEC relating to "Special Equipment," Special Conditions," Communication Systems" and "Tables." Strategies for finding and applying information found in these sections to real life situations is emphasized.

APR 213 Industrial Electrical Code IIIA
(3 class hrs/wk, 3 cr) Sp
Designed for students preparing to take examinations based on The National Electrical Code (NEC). The course includes a comprehensive study of the chapters of the NEC relating to "Special Equipment," Special Conditions," Communication Systems" and "Tables." Strategies for finding and applying information found in these sections to real life situations is emphasized.

APR 221 Specialized Systems
(4 class hrs/wk, 4 cr) F
Designed for the apprentice working/studying to become a licensed Limited Energy Technician. The wide range of topics covered in this class include: Specialty Transformers, Medical Systems, Sound and Signal Systems, and an introduction to both HVAC and Boiler systems. The National Electrical Code (NEC) requirements regarding the safe installation of each of these systems will be emphasized. Prerequisite: Instructor's consent.

APR 222 Process Control and Instrumentation
(4 class hrs/wk, 4 cr) F
Designed for the apprentice working/studying to become a licensed Limited Energy Technician. The topics covered in this course include: Instrumentation, Process Control and Distributed Control Systems. Emphasis will be placed on NEC/safety requirements as they relate to each of these systems. NEC practice exams will be administered during the last three weeks of the term. Prerequisite: Instructor's consent.

APR 223 Communication Systems and Networks
(4 class hrs/wk, 4 cr) F
Designed for the apprentice working/studying to become a licensed Limited Energy Technician. The topics covered in this course include: Cable Selection, Busses and Networks, Wireless Communication and an introduction to Site Survey and Job Planning. Application specific cable selection for safety, efficacy and code (NEC) requirements will be emphasized. Prerequisite: Instructor's consent.

APR 224 Protective Signaling
(4 class hrs/wk, 4 cr) F
Designed for the electrical apprentice working/studying to become a Class-A Limited Energy Technician. The topics covered in this course include: Fire Alarm Systems, Intrusion Detection Systems, Access Control and Nurse Call. The National Electrical Code (NEC) will be emphasized as it relates to the safe installation of each of these low voltage systems. Prerequisite: Instructor's consent.

APR 225 Systems Integration
(4 class hrs/wk, 4 cr) F
Designed for the electrical apprentice working/studying to become a Class-A Limited Energy Technician. The topics covered in this course include: audio, closed circuit television (CCTV), Broadband Systems and Systems Integration. The National Electrical Code (NEC) will be emphasized as it relates to the safe installation of each of these low-voltage systems. NEC practice exams will be administered during the last two weeks of the term. Prerequisite: Employed in the trade or instructor consent.

APR 252 Industrial Hydraulics I
(4 class hrs/wk, 4 cr) F
Provides a study of the basics of hydraulics used in the industrial manufacturing setting. Emphasis is on the components, circuit construction and the mathematical calculations used to compute pressure and force as it pertains to hydraulic equipment. Safety is stressed in each lesson. Prerequisite: APR 257 Math for Apprenticeship or equivalent.

APR 253 Industrial Hydraulics II
(4 class hrs/wk, 4 cr) W
A continuation of the material introduced in Industrial Hydraulics I and covers the mechanics and design of hydraulic power systems. This course incorporates hands-on exercises with hydraulic trainers which cover the principals of pressure and force. Prerequisite: APR 257 Math for Apprenticeship or equivalent and APR 252 Industrial Hydraulics I.

APR 254 Industrial Lube Fundamentals
(3 class hrs/wk, 3 cr) W
Introduces the apprentice to lubrication and bearings. Proper selection and application of lubricants will be discussed including lubrication programs typically implemented in the industrial environment. Apprentices will learn to identify and properly inspect a variety of types of bearing and seals. Preventive/predictive maintenance will be given special emphasis. Prerequisite: Instructor's approval.

APR 255 Introduction to Metallurgy
(3 class hrs/wk, 3 cr) Sp
Introduces the properties of various metals and their response to heating and cooling in the manufacturing setting. The metallurgy of welding is stressed with hands-on application to metal theory. Prerequisite: APR 257 Math for Apprenticeship.

APR 256 Electricity for Maintenance
(5 class hrs/wk, 4 cr) F/W
This course provides the student with a hands-on survey of electricity/electronics. Topics include DC and AC electricity, Ohm's Law, series and parallel circuits, electrical sources, semiconductor electronics and motors. The student will have an opportunity to construct various electrical circuits and test the electrical parameters associated with them, thereby confirming theoretical predictions and gaining knowledge in the proper use of electrical test equipment. Prerequisite: Instructor's approval.

APR 257 Math for Apprenticeship
(5 class hrs/wk, 5 cr) W
This course covers the mathematics needed for the industrial apprenticeship programs by emphasizing applications and problem-solving through studying basic operations with integers, exponents, algebraic expressions, linear equations, dimensional analysis, scientific notation, ratio and proportion, realistic percent problems, and an introduction to practical geometry and trigonometry. Prerequisite: Instructor's approval.

APR 258 Machinery Alignment
(3 class hrs/wk, 3 cr) Sp
Designed to give the student both theory and working knowledge for alignment of rotating equipment by using various methods and procedures. This course is applicable to all types of equipment alignment, from small pumps to large turbines. Prerequisite: APR 257 Math for Apprenticeship or instructor approval.

APR 260 Pumps and Pumping
(3 class hrs/wk, 3 cr) F
Covers the components, operations and maintenance of centrifugal pumps. Nomenclature of pumps, pump hydraulics and the procedures used in the performance of routine maintenance activities are illustrated. Pump operating conditions and troubleshooting also are covered.

AREC: AGRICULTURE AND RESOURCE ECONOMICS

AREC 211 Management in Agriculture
(4 class hrs/wk, 4 cr) F/W
Covers agriculture as a business; the decision-making process; tools of decision making; acquiring, organizing and managing land, labor and capital resources; and reasons for success and failure. Students learn teamwork, cooperation and leadership skills through classroom simulation, group activities and assignments.

AREC 213 Starting an Agricultural or Horticultural Business
(4 class hrs/wk, 4 cr) F
An introduction to starting a business in agriculture or horticulture. Skills, models, decision-making tools, and strategic alternatives analysis will be discussed. Students become familiar with business planning, including business structure selection, market assessment, risk analysis and mitigation, financial and tax planning, and federal programs and incentives. Resources for the entrepreneur are discussed. Agricultural and horticultural case studies and examples are emphasized.

AREC 221 Marketing in Agriculture
(3 class hrs/wk, 3 cr) F/W
Covers all aspects of sales and marketing of agricultural products, including fruits and vegetables, cereal grains, milk and dairy products, commercial and purebred livestock. The commodities futures market and other specialized outlets are also included.

ART: ART

ART 102 Understanding Art
➢ *(3 class hrs/wk, 3 cr) F/W/Sp*
Surveys the basic elements of visual form. Traditional and contemporary visual arts from around the world are examined in ways designed to provide a framework for meaningful responses to form and content.

ART 115 Basic Design I: Composition
➢ *(6 class hrs/wk, 4 cr) F/W*
Introduction to theory and studio practice in using the principles and elements of design to articulate visual ideas. Focus will be on concepts relating to 2-D design structure. Students will be exposed to art historical references as they relate to concepts as well as being encouraged to write and think critically about art and design. Emphasis will be on instilling sound foundational information in the traditional aspects of design as well as encouraging thoughtful exploration of contemporary design potential.

ART 116 Basic Design II: Color
➢ *(6 class hrs/wk, 4 cr) Sp/As needed*
Explore basic color theory and systems for organizing color harmonies. Students are exposed to art historical references and simple physics/optics as they relate to color, and encouraged to think and write critically about color as a form of expression. Students also will develop a critical awareness of color in studio practice, learn historical and cultural context of color usage, and discuss color as a means of visual communication. ART 115 recommended, but not required.

ART 117 Basic Design: 3-Dimensional
(6 class hrs/wk, 4 cr) Sp
A beginning course in he principles of 3-dimensional design. Emphasis will be on creative problem solving in a variety of media. Studio work explores basic elements of space, planes, mass, texture. Fundamentals course for students in ceramics, sculpture, architecture and other 3-D design fields. College-level reading and writing skills are strongly recommended for success in this course.

ART 131 Drawing I
➢ *(6 class hrs/wk, 4 cr) F/W/Sp/Su*
Emphasizes the development of perceptual and technical skills needed to describe 3-D objects on 2-D surfaces. Exposes students to conceptual and technical art references and encourages students to think critically about art and expression as an integral part of learning to draw.

ART 132 Drawing II
➢ *(6 class hrs/wk, 4 cr) W/Sp*
Advanced study in the development of composition, drawing technique, and perceptual and technical skills. Exposes students to more challenging art processes and encourages students to think critically about art and expression as their practice regarding drawing is broadened. Prerequisite: ART 131 Drawing I or instructor's approval.

ART 154 Ceramics I
➢ *(6 class hrs/wk, 4 cr) F/W/Sp*
Introduces clay as an expressive material. Emphasis on throwing skills on the wheel with attention to form and function of pots. Clay, glaze and firing techniques included. Note: Offered only at LBCC Benton Center in Corvallis.

ART 181 Introduction to Painting
➢ *(6 class hrs/wk, 4 cr) W*
Explores visual expression on a two-dimensional surface. Uses oil, acrylic or watercolor paints for spatial development of color, shape and surface. Drawing and design experience recommended. Prerequisite: ART 131 Drawing I or instructor's approval.

ART 198 Independent Studies
(3–6 class hrs/wk, 1–4 cr) F/W/Sp
A special studies class tailored to explore individually arranged projects within a discipline. May include fine arts portfolio preparation and other professional concerns. Prerequisite: Previous studio experience in the chosen area or instructor's approval.

ART 204 History of Western Art
➢ *(3 class hrs/wk, 3 cr) F/W/As needed*
Studies the history of Western visual art prehistory up to Middle Ages and its significance and relationship to humanity. (Recommended, but not required, that courses be taken in sequence.) College-level reading and writing skills are strongly recommended for success in this course.

ART 205 History of Western Art
➢ *(3 class hrs/wk, 3 cr) W/As needed*
Studies the history of Western visual art of the Middle Ages, Renaissance and Baroque and its significance and relationship to humanity. (Recommended, but not required, that courses be taken in sequence.) College-level reading and writing skills are strongly recommended for success in this course.

ART 206 History of Western Art
➢ *(3 class hrs/wk, 3 cr) Sp*
Studies the history of Western visual art of the 17th, 18th, 19th and 20th centuries and its significance and relationship to humanity. (Recommended, but not required, that courses be taken in sequence.) College-level reading and writing skills are strongly recommended for success in this course.

ART 207 Indigenous Art of the Americas
(3 class hrs/wk, 3 cr) Sp
A historical survey of native arts of South, Central, and North America, including architecture, sculpture, painting, ceramics, textiles, basketry, and beadwork from prehistory to the present. Recommended but not required that courses be taken in sequence. Recommended: College-level reading and writing skills.

ART 234 Figure Drawing
➢ *(6 class hrs/wk, 4 cr) F/Sp/As needed*
An introductory course in drawing the nude figure. Emphasis is on basic anatomical structures, surface topography, foreshortening, composition, and form. Students are exposed to art historical references as they relate to the human form, as well as being encouraged to write and think critically about art and expression. May be repeated for credit. Prerequisite: ART 131 Drawing I or instructor's approval. College-level reading and writing skills are strongly recommended for success in this course.

ART 254 Ceramics II
➢ *(6 class hrs/wk, 4 cr) W/Sp*
Provides instruction in clay construction for the experienced student, with advanced throwing and handbuilding, glazing and firing techniques. Note: Offered only at the LBCC Benton Center, Corvallis. Prerequisite: ART 154 Beginning Ceramics or instructor's approval.

ART 261 Introduction to Photography
(3 class hrs/wk, 3 cr) W
Introduces principles of photography, including exposure, camera handling, lighting, composition, using digital cameras. Also covers the history of photography, study of major artists and their work, and critical analysis of composition and content. This class is appropriate for majors in art, journalism, and graphic design.

ART 280 CWE Fine Arts
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
An instructional program to give students experience in supervised employment related to fine arts. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. CWE coordinator's approval required.

ART 281 Painting II
➢ *(6 class hrs/wk, 4 cr) W*
Explores visual expression on a two-dimensional surface. Uses oil, acrylic or watercolor paints for spatial development of color, shape and surface. Drawing and design experience recommended. Prerequisite: ART 131 Drawing I or instructor's approval.

AS: AEROSPACE STUDIES

AS 111 Foundations of the Air Force Part I
(1 class hr/wk,1 cr) F
The introduction to the Air Force mission and organization. Featured topics include Air Force dress and appearance standards: military customs and courtesies, Air Force heritage, overview of the Department of the Air Force , and Air Force core values. Basic oral and written communication will be assessed. Prerequisite: Taken concurrently with AS 120 for fully eligible General Military Course students.

AS 112 Foundations of the Air Force Part II
(1 class hr/wk,1 cr) W
Second part of the introduction to the Air Force mission and organization. Featured topics include Air Force career opportunities, Air Force benefits, military communication skills, Air Force installations, and look at the basic characteristics of war. Basic oral and written communication will be assessed. Prerequisite: Taken concurrently with AS 120 for fully eligible General Military Course students.

AS 113 Foundations of the Air Force Part III
(1 class hr/wk,1 cr) Sp
Third part of the introduction of what the Air Force is about and what the Air Force has to offer. Featured topics include basic leadership, team building, interpersonal skills, diversity in the Air Force, and the oath of office and commissioning. Basic oral and written communication will be assessed. Prerequisite: Taken concurrently with AS 120 for fully eligible General Military Course students.

AS 120 Leadership Laboratory
(2 class hr/wk,1 cr) Sp
Cadets learn officership, leadership, drill and ceremony, and customs and courtesies. Lab. Graded P/N. This course is repeatable for a maximum of 3 credits. Prerequisite: Departmental approval. Taken concurrently with AS 111, AS 112 and AS 113. Only offered to students enrolled in the AFROTC officer commissioning program.

AS 211 Evolution of Air and Space Power 1880-1945
(1 class hr/wk,1 cr) F
Study of the development of air power, concepts, and doctrine from its beginnings to the end of World War II. Historical examples examined include balloons, dirigibles, Wright Brother's first flight and the role of air power in World War I and II. Oral and written communication skills will be assessed. Prerequisite: If enrolled in the AFROTC officer commissioning program, must be taken concurrently with AS 220.

AS 212 Evolution of Air and Space Power 1945-1990
(1 class hr/wk,1 cr) W
Study of the development of air power, concepts, and doctrine during the Cold War. Historical examples examined include the Berlin Airlift, nuclear deterrence, and the role of air power employment in the Korean and Vietnam conflicts. Oral and written communication skills will be assessed. Prerequisite: Taken concurrently with AS 220 if fully eligible General Military Course student.

AS 213 Evolution of Air and Space Power 1991-2025
(1 class hr/wk,1 cr) Sp
Study of the factors contributing to the development of air power, concepts, and doctrine from the Persian Gulf War in 1990 to the present and beyond. Historical examples examined include the air campaigns used in the Gulf War, Kosovo crisis, Operations Enduring Freedom, Iraqi Freedom, and the Global War on Terrorism. Oral and written communication skills will be assessed. Prerequisite: Taken concurrently with AS 220 if fully eligible General Military Course student.

AS 220 Leadership Laboratory
(2 class hr/wk,1 cr) F/W/Sp
Cadets are placed in element leadership positions in order to know and comprehend the Air Force concepts of command, discipline, tradition, and courtesies. Lab. Graded P/N. This course is repeatable for a maximum of 3 credits. Prerequisite: Departmental approval. AS 220 is taken concurrently with AS 211, AS 212, and AS 213. Only offered to students enrolled in the AFROTC officer commissioning program.

AT: ANIMAL TECHNOLOGY

Courses with the AT prefix are career and technical courses that have a primary purpose of meeting requirements for the Associate of Applied Science degree. Four-year institutions may or may not accept them for transfer credit.

AT 143 Introduction to Horse Management
(2 class hrs/wk, 2 cr) F
Presents facility and herd management techniques in detail. Gives special focus to operating a "green" equine facility. Students learn alternative training methods and are given tools to assess those methods.

AT 147 Livestock Selection Techniques
(6 class hrs/wk, 4 cr) F
Concentrates on techniques, selection and comparative judging of beef, sheep and swine and intensive work on developing oral reasons and terminology. Designed for first-year students interested in livestock judging.

AT 149 Livestock Judging
(4 class hrs/wk, 4 cr) W
Provides an in-depth application of principles necessary for the successful comprehensive analysis of beef, sheep and swine. Prerequisite: Instructor's approval.

AT 152 Livestock Fitting and Showing
(4 class hrs/wk, 2 cr) W
Provides students with practical, hands-on experience in modern fitting and showing techniques. Current showmanship styles and showing etiquette also are covered.

AT 153 Livestock Events Practicum
(4 class hrs/wk, 2 cr) Sp
Offers students the opportunity to help organize and participate in diverse activities such as the LBCC Steer and Heifer Show, FFA Livestock Judging Contest, Agricultural Sciences Awards Banquet, and showing at various jackpot shows.

AT 154 Equine Business Management
(3 class hrs/wk, 3 cr) Sp
Covers the basic concepts of equine business management. The decision-making process, tools of decision making, and types of business organization are covered. Organizing, acquiring and managing land, labor and capital resources are taught. Students learn teamwork, cooperation and leadership skills through classroom activities and assignments.

AT 155 Equine Diseases and Parasites
(3 class hrs/wk, 3 cr) F
Covers the nature of equine diseases and parasites including common infectious and noninfectious diseases, diagnosis, treatment and prevention. Modern drugs and medications, immunology and basic microbiology also are included. Also covers common unsoundnesses of the foot and leg.

AT 156 Livestock Diseases and Parasites
(3 class hrs/wk, 3 cr) Sp
Covers the nature of livestock diseases caused by infectious and non-infectious organisms. Nutritional, metabolic and chemical-related diseases are studied as well as internal and external parasites. Emphasis is on diagnosis, control, treatment and prevention of economically important diseases and conditions. Note: Course is offered alternate years only. Offered spring 2011.

AT 163 Schooling the Horse I
(7 class hrs/wk, 3 cr) W
Provides hands-on horse training experience. The student learns the fundamentals of horse training, including longeing, working in the round pen, driving, bitting, riding, rein aids, lateral work, and basic training techniques. Equipment, safety and horse "psychology" also are taught. Prerequisite: ANS 222 Young Horse Training or instructor's approval.

AT 164 Schooling the Horse II
(7 class hrs/wk, 3 cr) Sp
Provides hands-on horse training experience. The student learns the fundamentals of horse training, including advanced arena and trail work. Equipment, safety and horse "psychology" also are taught. Prerequisite: AT 163 Schooling the Horse I or instructor's approval.

AT 248 Advanced Livestock Selection
(6 class hrs/wk, 4 cr) F
Advanced course in developing judging skills and techniques. Emphasizes oral reasons, market and breed type and characteristics, and performance data. Prerequisite: AT 147 Livestock Selection Techniques.

AT 263 Schooling the Horse III
(7 class hrs/wk, 3 cr) W
Advanced training techniques for horses are emphasized. Introduces reining, dressage and jumping. Prerequisite: AT 164 Schooling the Horse II or instructor's approval.

AT 264 Schooling the Horse IV
(7 class hrs/wk, 3 cr) Sp
Advanced training techniques for horses are emphasized. Introduces reining, dressage and jumping. Prerequisite: AT 263 Schooling the Horse III.

AT 277A Horse Breeding Management
(2 class hrs/wk, 2 cr) W
Familiarizes students with all aspects of reproductive management of the horse. Reproductive physiology, estrous cycles, breeding management, mare and foal care, stallion handling and record keeping are covered. Prerequisite: ANS 222 Young Horse Training or instructor's approval.

AT 277B Horse Breeding Management Lab
(4.5 class hrs/wk, 2 cr) Sp
Exposes students to "hands on" aspects of breeding management, including teasing, semen collection and processing, stallion handling, artificial insemination, foaling, foaling management and mare care. Prerequisite: AT 277A Horse Breeding Management.

AU: AUTOMOTIVE TECHNOLOGY

AU 3.295 Power Train Systems
(20 class hrs/wk, 1–10 cr) F
Studies the complete power train system, with emphasis on the theory, application and servicing of clutch systems, manual transmissions, transfer cases, drive lines, universal joints and differential assemblies. All students must pass online safety and pollution prevention tests to receive credit for this course. Prerequisites: Placement Test scores for RD 090 College Success & Reading Strategies and WR 095 College Writing Fundamentals.

AU 3.296 Steering, Suspension and Braking Systems
(20 class hrs/wk, 1–10 cr) Sp
Covers the theory of operation, service and repair for steering, suspension, alignment and braking systems. Diagnosis and service techniques are practiced on light trucks and passenger vehicles. Focus will be on providing professional quality service that ensures the safety of the technician, vehicles, occupants, and the environment. All students must complete online safety and pollution prevention tests to receive credit for this course. Prerequisites: Placement Test scores for RD 090 College Success & Reading Strategies, WD 095 College Writing Fundamentals or higher, and AU 3.322 Introduction to Braking Systems.

AU 3.297 Electrical and Electronic Systems
(20 class hrs/wk, 1–10 cr) W
Introduces the theory and diagnosis of the electrical and electronic control vehicle control systems. Emphasis will be placed on batteries, starting, charging, lighting, accessories and driver information systems. This course will prepare you for ASE certification in electrical/electronic systems. All students must pass online safety and pollution prevention tests to receive credit for this course. Prerequisites: Placement Test scores for RD 090 College Success & Reading Strategies and WR 095 College Writing Fundamentals or higher.

AU 3.298 Engine Performance
(20 class hrs/wk, 1–10 cr) F
Problem-solving course designed to develop knowledge and skills in auto tune-up. Emphasizes selection and use of equipment, including electrical test equipment, scan tools, the oscilloscope, emission test equipment and the dynamometer, to find malfunctions and make necessary repairs for optimum engine performance. Prerequisite: AU 3.297 Electrical and Electronic Systems or instructor's approval.

AU 3.299 Automotive Engines
(13 class hrs/wk, 1–8 cr) F
Skillbuilding course designed to develop knowledge and skills in understanding and rebuilding automotive engines. Emphasizes the use of equipment for repairing and reconditioning engine components back to industry standards. Prerequisite: Major in automotive technology with sophomore standing or instructor's approval.

AU 3.300 Automatic Transmissions and Transaxles
(13 class hrs/wk, 1–8 cr) Sp
Develops knowledge and skills in automatic transmissions/transaxles. Emphasizes selection and use of equipment, including electrical test equipment, scan tools, transmission/transaxle rebuilding specialty tools, and transmission dynamometer, to find malfunctions and make necessary repairs for correct shift timing, feel and operation. Prerequisite: AU 3.297 Electrical and Electronic Systems or instructor's approval.

AU 3.301 Automotive Service and Repair Practices
(6 class hrs/wk, 1–2 cr) F/W/Sp
Provides a simulated workplace environment to gain experience with the diagnosis and repair of vehicles. Comparing actual repair time to a professional flat-rate time standard will challenge your use of tools and service literature. Improves your performance as a professional automotive technician. All personal, vehicle and environmental safety precautions will be practiced. Prior experience or instruction for repair projects is required. Prerequisite: Major in automotive technology or instructor's approval.

AU 3.303 Mobile Air Conditioning and Comfort Systems I
(5 class hrs/wk, 3 cr) W
Theoretic principles of mobile heating and air conditioning systems with emphasis on design, function, adjustment, service and testing of components. Prerequisite: AU 3.297 Electrical/Electronic Systems or instructor's approval.

AU 3.304 Mobile Air Conditioning and Comfort Systems II
(5 class hrs/wk, 3 cr) Sp
Students learn theory and service practices in maintenance and repair of automotive comfort systems. Covers inspection, testing, repair and/or replacement of control units and computer control systems. Prerequisites: AU 3.303 Mobile Air Conditioning and Comfort Systems I or instructor's approval.

AU 3.314 Introduction to Engine Performance
(4 hrs/wk, 3 cr) F
A required course for automotive technology students covering electrical, ignition and compression systems theory with an emphasis on the use of diagnostic equipment. Prerequisites: Placement Test scores for RD 090 College Success & Reading Strategies and MTH 020 Basic Mathematics or equivalent.

AU 3.315 Lab Scope Diagnostics
(4 hrs/wk, 3 cr) F
In this course we focus on the use of Snap-on computer automotive diagnostic equipment. You will practice with electronic repair data base programs to interpret scan tool data and recover computer system schematics. Online resources will be explored to understand waveform patterns captured with the lab scope. We begin by interpreting a simple sensor waveform. By the end of the course you will have learned to evaluate computer controlled fuel and ignition systems using the digital storage oscilloscope commonly called the Lab Scope. Prerequisite: AU 3.297 Electrical and Electronic Systems or instructor's approval.

AU 3.322 Introduction to Braking Systems
(4 class hrs/wk; 3 cr)
Provides experience with the operational theory and maintenance of passenger vehicle braking systems. Students will learn to measure, inspect, machine and replace disc and drum brake components. Emphasis will be to ensure the safety of the technician, the vehicle, the occupants, and the environment. Each student must supply professional quality tools outlined at *www.linnbenton.edu/auto/tool_list.htm*. Prerequisite: Placement into RD 090 College Success & Reading Strategies and WR 095 College Writing Fundamentals or higher.

BA: BUSINESS

BA 101 Introduction to Business
(4 class hrs/wk, 4 cr) F/W/Sp
Provides a general survey of the functional and interdependent areas of business management, marketing, accounting and finance, and management information systems. Includes business trends, operation and management of a business, ethical challenges, environmental responsibility, change, global perspectives and the dynamic roles of management and staff. Incorporates aspects of team interaction and continuous process improvement. Provides the opportunity to explore the Internet and information technology relating to business operations. Prerequisite: WR 095 College Writing Fundamentals with a minimum "C" grade.

BA 206 Principles of Management
(3 class hrs/wk, 3 cr) F/W/Sp
An overview of the processes involved in managing a business, including business planning, organizing, controlling, staffing and leading. Covers various theories of management with emphasis on managing a business in the local, national or international marketplace. Prerequisite: BA 101 Introduction to Business with a minimum "C" grade.

BA 211 Principles of Accounting: Financial
(4 class hrs/wk, 4 cr) F/W/Sp
Presents financial accounting concepts and the use of accounting information in decision making. Includes an overview of the accounting cycle. Prerequisite: MTH 095 Intermediate Algebra. Strongly recommend CIS 125 Introduction to Software Applications.

BA 213 Principles of Accounting: Managerial
(4 class hrs/wk, 4 cr) F/W/Sp
Demonstrates the use of accounting information to meet organization goals. Methods of extracting accounting information for decision making, management of resources, planning, and product and service costing are covered. Prerequisite: BA 211 Principles of Accounting: Financial or equivalent.

BA 215 Survey of Accounting
(4 class hrs/wk, 4 cr) F/Sp
Introduces financial accounting techniques, measuring and recording transactions, preparing financial statements, managerial decision making, and planning and control devices, such as budgeting, cost accounting, capital budgeting, and break-even analysis. Includes assessment of financial information from managers, lenders, and investors' perspective to understand evaluation of profitable business alternatives. Prerequisite: MTH 065 Elementary Algebra.

BA 218 Personal Financial Planning
(3 class hrs/wk, 3 cr) As needed
A basic personal finance course that introduces students to management of cash, savings, and credit. Students also will be introduced to investment strategies and planning. Prerequisite: MTH 065 Elementary Algebra Recommended: MTH 095 Intermediate Algebra.

BA 221 Production and Operation Management
(3 class hrs/wk, 3 cr) W
Presents ideas in which managers and supervisors can implement strategic, tactical and operational planning in a business environment and its relationship to the success of business. Prerequisites: BA 101 Introduction to Business with a "C" or better, BA 206 Principles of Management, and CIS 125 Introduction to Software Applications.

BA 222 Financial Management
(3 class hrs/wk, 3 cr) Sp
Covers topics dealing with financing a business, analysis of financial statements, working capital management, short- and long-term financial planning, budgeting and control. Prerequisite: BA 2.596 Professional Accounting II with a minimum "C" grade or BA 211 Principles of Accounting: Financial.

BA 223 Principles of Marketing
(4 class hrs/wk, 4 cr) As needed
Provides a general survey of the nature, significance and scope of marketing. Emphasizes customers (marketing analysis and strategy); business marketing decisions in promotion, distribution and pricing; and control of marketing programs. Prerequisite: BA 101 Introduction to Business with a minimum "C" grade or instructor's approval.

BA 224 Human Resource Management
(3 class hrs/wk, 3 cr) F/W/Sp
Explores the basics of human resource management within a culturally diverse workplace. Covers origins of cultural difference and how discrimination issues impact the workplace. Also covers current HR issues, such as workplace violence and drug abuse, equitable processes for selection and hiring, performance appraisal, compensation, staff planning, and job analysis.

BA 226 Business Law
(3 class hrs/wk, 3 cr) F/W/Sp
Introduces the framework of the law as it affects a business, including the origins of the American legal system, how the law operates and how it is enforced. Covers legal regulation of business, including civil and criminal law, formation of contracts, employment law, environmental regulation, real estate and consumer rights.

BA 249 Retail Management
(3 class hrs/wk, 3 cr) As needed
Introduces students to retailing and provides an understanding of the types of businesses, strategies, operations, formats and environments through which retailing is carried out. The course takes a multi-disciplinary approach to consider the process and structure of retailing. Retailing topics to be covered will include: planning, research, consumers' behavior, store design, merchandising strategy, management strategy, promotional strategy and pricing strategy. The global dimensions of retailing as well as the relationship between retailing and our society will be stressed throughout the course.

BA 256 Income Tax Accounting
(3 class hrs/wk, 3 cr) W
Introduces the basics of income tax accounting for individuals and business organizations. Develop an understanding of basic tax calculations and of how the Internal Revenue Code impacts individuals and businesses. Explore methods of incorporating and extracting income tax information from an organization's existing financial accounting system. Prerequisite: BA 2.595 Professional Accounting I with a minimum "C" grade.

BA 260 Entrepreneurship and Small Business Management
(4 class hrs/wk, 4 cr) F/W/Sp
Presents focused information on small businesses and entrepreneurship and their importance in the growth of the economy. Prerequisite: BA 101 Introduction to Business with a minimum "C" grade and CIS 125 Introduction to Software Applications.

BA 275 Business Quantitative Methods
(4 class hrs/wk, 4 cr) F/W/Sp
Presents statistical analysis and quantitative tools for applied problem solving and making sound business decisions. Gives special attention to assembling statistical description, sampling, inference, regression, hypothesis testing, forecasting and decision theory. Prerequisite: CIS 125 Introduction to Software Applications, MTH 241 Calculus for Biological/Management/Social Science, MTH 245 Math for Biological/Management/Social Science, and sophomore standing.

BA 280A CWE Accounting Technology
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to accounting. Students identify job performance objectives, work a specified number of hours during the term and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator approval.

BA 280B CWE Business Management
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to business management. Students identify job performance objectives, work a specified number of hours during the term and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

BA 280C CWE Business Marketing
(3-42 class hrs/wk, 1-14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to business marketing. Students identify job performance objectives, work a specified number of hours during the term and attend related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

BA 285 Business Relations in a Global Economy
(4 class hrs/wk, 4 cr) F/W
Examines culture and cultural diversity and their impact on organizations. Examines issues such as motivation, communication, value development, prejudice and discrimination. Focuses on understanding how and why cultures develop differently, including the impact of economic and political influences on culture. Also focuses on helping students develop an understanding of their own culture and gain an appreciation for and understanding of other cultures.

BA 291 Business Process Management
(4 class hrs/wk, 4 cr) F/W/Sp
This course integrates management information systems with operations management and introduces a process-oriented view of the flows of materials, information, products and services through/across functions within an organization. Prerequisite: BA 101 Introduction to Business, CIS 125 Introduction to Software Applications, and BA 275 Business Quantitative Methods.

BA 2.108 Customer Service
(3 class hrs/wk, 2 cr) As needed
Designed to help students develop the customer interaction skills needed in many work settings.

BA 2.108A Customer Service
(1.5 class hrs/wk, 1 cr) As needed
Designed to help students develop the customer interaction skills needed in many work settings.

BA 2.127 Governmental Accounting
(3 class hrs/wk, 3 cr) F
Covers accounting theory and procedures for governmental and not-for-profit entities, including budgetary and expenditure control. Prerequisite: BA 211 Principles of Accounting: Financial or BA 2.532 Practical Accounting III with a minimum "C" grade.

BA 2.530 Practical Accounting I
(4 class hrs/wk, 4 cr) F/W/Sp
Covers the fundamental principles of double-entry accounting, general journals and ledgers, business forms, simple financial statements and the completion of the accounting cycle. Emphasizes cash receipts and payments, payroll accounting, purchases and sales.

BA 2.531 Practical Accounting II
(4 class hrs/wk, 4 cr) F/W/Sp
Continues BA 2.530 Practical Accounting I, with an explanation of the accounting cycle. Covers special journals, ledgers and business forms, including vouchers. Emphasizes accounting for partnerships. Prerequisite: BA 2.530 Practical Accounting I.

BA 2.532 Practical Accounting III
(4 class hrs/wk, 4 cr) F/W/Sp
Third course in the Practical Accounting series. Includes entries requiring analysis and interpretation, unearned and accrued items, depreciation of assets, manufacturing accounting and other managerial accounting procedures. Prerequisite: BA 2.531 Practical Accounting II.

BA 2.534 Cost Accounting
(3 class hrs/wk, 3 cr) W
Relates theory to practical problems in analysis and control of material, labor and overhead costs in manufacturing. Emphasizes the job cost system. Prerequisite: BA 211 Principles of Accounting: Financial or BA 2.595 Professional Accounting I with a minimum "C" grade.

BA 2.535 Payroll Accounting
(3 class hrs/wk, 2 cr) Sp
Designed to reinforce and supplement payroll skills in both manual formats and computerized formats. Prerequisite: BA 2.530 Practical Accounting I, BA 211 Principles of Accounting: Financial, or instructor's approval.

BA 2.569 First Course in Computers
(3 class hrs/wk, 2 cr) F/W/Sp/Su
Designed to help a beginning computer user feel comfortable operating a personal computer and its peripherals.

BA 2.595 Professional Accounting I
(3 class hrs/wk, 3 cr) F
Provides an advanced study of accounting theory and practice for measurement of income and valuation of assets in financial statement presentation. Reviews accounting concepts and alternative approaches to various problems. Prerequisite: BA 2.532 Practical Accounting III with a minimum "C" grade or BA 211 Principles of Accounting: Financial and BA 213 Principles of Accounting.

BA 2.596 Professional Accounting II
(3 class hrs/wk, 3 cr) W
Continues the Professional Accounting sequence. Covers concepts and procedures of valuation for various types of assets and liabilities, including special problems related to investments; plant, property and equipment; consolidations; and corporate accounting. Prerequisite: BA 2.595 Professional Accounting I with a minimum "C" grade.

BA 2.597 Professional Accounting III
(3 class hrs/wk, 3 cr) Sp
Continues the Professional Accounting sequence. Emphasizes fund flow analysis, financial ratios, preparing statements from incomplete data, correcting errors in prior year statements and price level changes. Job search skills are emphasized also. Prerequisite: BA 2.596 Professional Accounting II with a minimum "C" grade.

BA 2.684 Computerized Accounting
(4 class hrs/wk, 3 cr) W/Sp
Provides hands-on computer experience in accounting applications, including general ledger, accounts receivable, accounts payable and financial statements. Prerequisite: BA 2.530 Practical Accounting I or BA 211 Principles of Accounting: Financial.

BI: BIOLOGY

BI 4.210 Preparation for Anatomy and Physiology
(1 class hr/wk, 1 cr) As needed
Combines instruction in study skills with basic biological content to prepare students for the three-term Anatomy and Physiology sequence. The course is appropriate for students planning to take the Anatomy and Physiology sequence in the near future.

BI 101 General Biology
● *(5 class hrs/wk, 4 cr) F/W/Sp/Su*
An introductory lab science course intended for majors in disciplines other than the biological sciences. Topics presented include ecological principles, biodiversity, and impact of human activities on the environment. Additionally the course is designed to help students discover the applications of science to their everyday lives, as well as provide elements of critical thinking. Different sections of this course may emphasize different themes as indicated by the subtitles. Examples include: Environmental Issues, Oregon Ecology, Marine Biology, Marine Biology for Education Majors or General Biology.

Students may select the theme that interests them most, but the course may be used only once to meet graduation requirements. Biology 101, 102, and 103 need not be taken in numerical order. Strongly recommended: MTH 065 Elementary Algebra and college-level reading and writing are strongly recommended for success in this course. This course includes a laboratory component.

BI 102 General Biology
● *(5 class hrs/wk, 4 cr) F/W/Sp/Su*
An introductory lab science course intended for majors in disciplines other than the biological sciences. Topics presented include biological molecules, cellular biology, genetics and inheritance, and evolutionary processes. Additionally the course is designed to help students discover the applications of science to their everyday lives, as well as provide elements of critical thinking. Different sections of this course may emphasize different themes as indicated by the subtitles. Students may select the theme that interests them most, but the course may be used only once to meet graduation requirements. Biology 101, 102 and 103 need not be taken in numerical order. Strongly recommended: MTH 065 Elementary Algebra and college-level reading and writing are strongly recommended for success in this course. This course includes a laboratory component.

BI 103 General Biology
● *(5 class hrs/wk, 4 cr) F/W/Sp/Su*
An introductory lab science course intended for majors in disciplines other than the biological sciences. Topics presented include plant anatomy and physiology, human anatomy and physiology, and human diseases. Additionally the course is designed to help students discover the applications of science to their everyday lives, as well as provide elements of critical thinking. Different sections of this course may emphasize different themes as indicated by the subtitles. Examples include: Nutrition and Health, Human Body, Plant and Animal Systems, Dynamic Plant, and General Biology. Students may select the theme that interests them most, but the course may be used only once to meet graduation requirements. Biology 101, 102 and 103 need not be taken in numerical order. Strongly recommended: MTH 065 Elementary Algebra and college-level reading and writing are strongly recommended for success in this course. This course includes a laboratory component.

BI 112 Cell Biology for Health Occupations
(4 class hrs/wk, 4 cr) F/W/Sp/Su
Introduces the health occupations student to the generalized human cell, including its structure, function, basic genetics and reproduction. The chemical and physical processes that affect the cell and its components will be examined throughout the course. This course covers the basic principles and vocabulary to prepare students for the study of human organ systems that occur in BI 231, BI 232 and BI 233 Human Anatomy and Physiology. College-level reading and writing are strongly recommended for success in this course.

BI 200 Principles of Ecology: Field Biology
● *(5 class hrs/wk, 4 cr) As needed*
Provides an introduction to the concepts of ecology. The broad concepts of ecology are emphasized in a field setting using natural ecosystems as a model. The classroom lecture component will cover concepts of ecology and diversity of life and the field component allows the surveying of the plants and animals in their interaction with the environment. Ecological concepts are examined in detail using student-collected field data. This course includes a laboratory component.

BI 211 Principles of Biology
● *(6 class hrs/wk, 4 cr) F*
One of three introductory courses intended for science majors: biochemistry, botany, zoology, forestry, microbiology, fisheries and wildlife, agriculture, pre-medical, pre-dental, pre-veterinary, pre-pharmacy, biology, etc. A survey of biodiversity: the major groups of organisms, their classification, and their evolutionary relationships. Biology 211, 212 and 213 need not be taken in numerical order. Corequisite: CH 121 College Chemistry or CH 221 General Chemistry. This course includes a laboratory component.

BI 212 Principles of Biology
● *(6 class hrs/wk, 4 cr) W*
One of three introductory courses intended for science majors: biochemistry, botany, zoology, forestry, microbiology, fisheries and wildlife, agriculture, premedical, pre-dental, pre-veterinary, pre-pharmacy, biology, etc. Focuses on cell structure and metabolism and the structure and function of plants and animals. Biology 211, 212 and 213 need not be taken in numerical order. Prerequisite: CH 121 College Chemistry or CH 221 General Chemistry. This course includes a laboratory component.

BI 213 Principles of Biology
● *(6 class hrs/wk, 4 cr) Sp*
One of three introductory courses intended for science majors: biochemistry, botany, zoology, forestry, microbiology, fisheries and wildlife, agriculture, premedical, pre-dental, pre-veterinary, pre-pharmacy, biology, etc. Focuses on genetics, evolution, ecology and behavior. Biology 211, 212 and 213 need not be taken in numerical order. Prerequisite: CH 121 College Chemistry or CH 221 General Chemistry. This course includes a laboratory component.

BI 231 Human Anatomy and Physiology
● *(6 class hrs/wk, 5 cr) F/W/Sp*
The first term of an introduction to the structure and function of the human body. This course is of particular benefit to students in the health professions and physical education, but is valuable to others interested in the anatomy and physiology of the body. Focuses on the structure and function of the cell, basic biochemistry, tissues, skin, skeleton and muscles. Prerequisites: MTH 065 Elementary Algebra and BI 112 Cell Biology for Health Occupations with a grade "C" or better, BI 212 Principles of Biology with a grade "C" or better. Strongly recommended: MTH 065 Elementary Algebra and college-level reading and writing are strongly recommended for success in this course. This course includes a laboratory component.

Students who are currently enrolled in BI 231 or BI 232 will be allowed to register for the next sequence course (BI 232 or BI 233) before priority registration for continuing students. Current BI 231 and BI 232 faculty will announce the day, time and restrictions for this special registration day. Students will be permitted to register for only the Anatomy and Physiology class at this time. All holds on student accounts must be resolved prior to this registration day. Students must earn a "C" or better in BI 231 or BI 232 to move to the next sequence course. The week after grades are submitted, students who earned less than a "C" in BI 232 or BI 233 will be dropped from the pre-registered sequence course.

BI 232 Human Anatomy and Physiology
● *(6 class hrs/wk, 5 cr) F/W/Sp*
The second term of an introduction to the structure and function of the human body. This course is of particular benefit to students in the health professions and physical education, but is valuable to others interested in the anatomy and physiology of the body. Focuses on the nervous system, endocrine system, and cardiovascular system. Prerequisite: BI 231 Human Anatomy and Physiology with a grade of "C" or better. Strongly recommended: MTH 065 Elementary Algebra and college-level reading and writing are strongly recommended for success in this course. This course includes a laboratory component.

Students who are currently enrolled in BI 231 or BI 232 will be allowed to register for the next sequence course (BI 232 or BI 233) before priority registration for continuing students. Current BI 231 and BI 232 faculty will announce the day, time and restrictions for this special registration day. Students will be permitted to register for only the Anatomy and Physiology class at this time. All holds on student accounts must be resolved prior to this registration day. Students must earn a "C" or better in BI 231 or BI 232 to move to the next sequence course. The week after grades are submitted, students who earned less than a "C" in BI 232 or BI 233 will be dropped from the pre-registered sequence course.

BI 233 Human Anatomy and Physiology
● *(6 class hrs/wk, 5 cr) F/W/Sp*
The third term of an introduction to the structure and function of the human body. This course is of particular benefit to students in the health professions and physical education, but is valuable to others interested in the anatomy and physiology of the body. Focuses on the lymphatic system, respiratory system, urinary system, fluid and electrolyte balance, digestive system and reproductive system. Prerequisite: BI 232 Human Anatomy and Physiology with a grade of "C" or better. Strongly recommended: MTH 065 Elementary Algebra and college-level reading and writing are strongly recommended for success in this course. This course includes a laboratory component.

BI 234 Microbiology
● *(7 class hrs/wk, 4 cr) F/W/Sp/Su*
An introductory lecture/laboratory course covering all microbial life, with emphasis on bacterial forms. We will focus on examining bacterial cell structure, metabolism, microbial genetics and growth. We also will investigate host-pathogen relationships that lead to disease and health. In the laboratory, students learn basic microscope and culture procedures and will investigate the occurrence and behavior of microorganisms in our environment. This course includes a laboratory component.

BI 280 CWE Biology
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to biology. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

CA: CULINARY ARTS

CA 8.301 Culinary Arts Career Planning
(2 class hrs/wk, 1 cr) Sp
Prepares the student for entering the culinary work force. Students create a résumé for use in a mock interview. They prepare a five-year career plan and explore different career opportunities using resources such as the Internet, industry periodicals, and employment department career information.

CA 8.309 Purchasing for Chefs
(2 class hrs/wk, 2 cr) Sp
Through lecture, role-playing, research and written assignments, students learn to write specifications for projects and skills needed for working with purveyors. All reports, menus and projects will be completed using a word processing program. Students will also learn standard storeroom procedures.

CA 8.321 Advanced Cooking Management I
(20 class hrs/wk, 7 cr) F
From the fundamental skills attained in Practicum I, II and III, students refine and advance their culinary skill to include a la carte, front line cookery, advanced baking and pastry, advanced garde manger and dining room management skills. Students are directly involved in running a "working restaurant," giving them a realistic experience while honing work habits and awareness of production demands. Prerequisite: "B" or higher grade in CA 101 Culinary Arts Practicum I, CA 102 Culinary Arts Practicum II, and CA 103 Culinary Arts Practicum III. (Exceptions may be made on a case by case basis.)

CA 8.322 Advanced Cooking Management II
(20 class hrs/wk, 7 cr) W
From the fundamental skills attained in Practicum I, II and III, students refine and advance their culinary skill to include a la carte, front line cookery, advanced baking and pastry, advanced garde manger and dining room management skills. Students are directly involved in running a "working restaurant," giving them a realistic experience while honing work habits and awareness of production demands. Prerequisite: "B" or higher grade in CA 101 Culinary Arts Practicum I, CA 102 Culinary Arts Practicum II, and CA 103 Culinary Arts Practicum III and a "C" or higher in CA 8.321 Advanced Cooking Management I. (Exceptions may be made on a case by case basis.)

CA 8.323 Advanced Cooking Management III
(20 class hrs/wk, 7 cr) Sp
From the fundamental skills attained in Practicum I, II and III, students refine and advance their culinary skill to include a la carte, front line cookery, advanced baking and pastry, advanced garde manger and dining room management skills. Students are directly involved in running a "working restaurant," giving them a realistic experience while honing work habits and awareness of production demands. Prerequisites: "B" or higher grade in CA 101 Culinary Arts Practicum I, CA 102 Culinary Arts Practicum II, and CA 103 Culinary Arts Practicum III. And a "C" or higher in CA 8.322 Advanced Cooking Management II. (Exceptions may be made on a case by case basis.)

CA 8.341 Soups and Sauces
(8 class hrs/wk, 3 cr) W
Students study and practice the art of classical and modern sauce and soup making from varied national and ethnic cuisines. Hands-on lab activities stress both large scale and a la carte production techniques. Prerequisite: "C" or higher grade in CA 103 Culinary Arts Practicum III.

CA 8.344 Food and Beer Pairing
(3 class hrs/wk, 3 cr) SP
Explore the use of beer in the preparation and pairing of food. Includes experimentation and tasting in a hands-on environment. Also learn to identify the characteristics of food and match them with complementary beer.

CA 8.346 Culinary Fundamentals
(3 class hrs/wk, 3 cr) F
Students learn the fundamentals of classical culinary techniques, sanitation and safety through lectures, demonstrations and hands-on projects. Proper use of tools, equipment, flavoring ingredients and garnish will be covered.

CA 8.348 Wine Analysis and Theory
(3 class hrs/wk, 3 cr) W
Students learn the skills of tasting and analyzing wine. Traditional terminology, tasting techniques and methods are used. Components of wine, production techniques, wine regions, and grape varieties are covered with emphasis on local wines and wine industry. Must be 21 years of age.

CA 8.349 Cooking with Wine (Sauces)
(3 class hrs/wk, 3 cr) W
Explore the use of wine in the preparation of sauces. Learn technology skills by preparing a spreadsheet containing an inventory of tasting notes and preparing a paper using a word processing program. Includes experimentation and tasting in a hands-on environment. Also learn to identify the character of sauces and match them with complementary wines. Prerequisite: CA 8.346 Culinary Fundamentals. Must be at least 21 years of age.

CA 8.350 Banquets and Buffet Lab A
(3 class hrs/wk, 1 cr) W
Provides students the opportunity to participate in actual banquet and buffet functions, from small caterings to very large banquets. Set up, production load, banquet and catering plans, service techniques, organizational skills, costs and breakdown systems are presented.

CA 8.351 Banquets and Buffet Lab B
(4 class hrs/wk, 2 cr) Sp
Provides students the opportunity to participate in actual banquet and buffet functions, from small caterings to very large banquets. Set up, production load, banquet and catering plans, service techniques, organizational skills, costs and breakdown systems are presented.

CA 8.352 Banquets and Buffet Lab C
(3 class hrs/wk, 1 cr) W
Provides students the opportunity to participate in actual banquet and buffet functions, from small caterings to very large banquets. Set up, production load, banquet and catering plans, service techniques, organizational skills, costs and breakdown systems are presented. Prerequisite: CA 8.350 Banquets and Buffet Lab A and CA 8.351 Banquets and Buffet Lab B.

CA 8.353 Banquets and Buffet Lab D
(4 class hrs/wk, 2 cr) Sp
Provides students the opportunity to participate in actual banquet and buffet functions, from small caterings to very large banquets. Set up, production load, banquet and catering plans, service techniques, organizational skills, costs and breakdown systems are presented. Prerequisite: CA 8.350 Banquets and Buffet Lab A and CA 8.351 Banquets and Buffet Lab B.

CA 8.354 Banquets and Buffet Lab E
(3 class hrs/wk, 1 cr) F
Covers the planning and execution of a banquet, buffet or catering as a member of a team. Students evaluate food for taste arrangement, adherence to theme, cost, etc. Students learn set-up, service and clean up procedures for a large food function. Prerequisite: Instructor's approval.

CA 8.355 Banquet and Buffet Planning
(2 class hrs/wk, 2 cr) W
To be taken in conjunction with CA 8.352 and CA 8.353 Banquet and Buffet Lab C and D. Students participate in the planning and execution of winter and spring term banquets, food show and other special events. Prerequisites: CA 8.350 Banquets and Buffet Lab A and CA 8.351 Banquets and Buffet Lab B.

CA 8.360 Cooking with Wine (Entrees)
(3 class hrs/wk, 3 cr) Sp
Students explore the use of wine in the preparation of main entrees. Students learn through experimentation and tasting in a hands-on environment. Emphasis placed on identifying the distinguishing characteristics of foods and dishes and matching them with complementary wines. Prerequisite: CA 8.346 Culinary Fundamentals and CA 8.349 Cooking with Wine (Sauces). Must be at least 21 years of age.

CA 8.361 Food and Wine Pairing
(4 class hrs/wk, 4 cr) F
Students apply their knowledge of food and wine characteristics to the pairing of food and wine in a series of tastings. Generally accepted standards for pairing food and wine are presented. Students learn how to pair wines with new food trends. Particular emphasis is placed on varietal wines. Prerequisite: VMW 131 Wine Appreciation (Chemeketa), VMW 232 Sensory Evaluation of Wine Varietals (Chemeketa) and CA 8.346 Culinary Fundamentals. Must be 21 years of age.

CA 8.364 Banquet and Buffet Sommelier Lab
(4 class hrs/wk, 2 cr) Sp
Provides students the opportunity to participate in actual banquet and buffet functions. Students choose wines to complement the banquet menu and then present and serve the wine(s) at the actual banquet. Emphasizes how to describe, open and pour wine. Prerequisite: Must be 21 years of age.

CA 8.368 Creating the Menu
(2.5 class hrs/wk, 2 cr) F
Students are expected to create a menu and support documentation for a restaurant or other food operation using the skills and concepts presented in this class. Throughout the term students will work on components of the final project. Prerequisite: CA 8.373 Costing.

CA 8.373 Costing
(2.5 class hrs/wk, 1 cr) Sp
Teaches theory and practice of determining food cost for restaurant and institutional cooking.

CA 8.380 Plated Desserts
(3 class hrs/wk, 3 cr)
An advanced pastry class focusing on the techniques for plate presentation of chocolate, confections, and frozen desserts. This course will cover chocolate tempering, chocolate decorating, and garnishes to maximize impact. We will discuss sugar work and cover techniques for making garnishes. This course will also cover equipment, ingredients, and trouble shooting for confection work. We will cover freezing, mixing, and consistency for frozen dessert products.

CA 8.381 Fruit Desserts & Laminated Doughs
(3 class hrs/wk, 3 cr)
An advanced course focusing on fruit desserts and presentation techniques. We will integrate laminated doughs for structure, appearance, and flavor.

CA 8.382 Chocolate, Confections, Frozen Desserts
(3 class hrs/wk, 3 cr)
An advanced pastry class focusing on the techniques chocolate, confections and frozen desserts. This course will cover chocolate tempering, chocolate decorating, truffles and confections. We will discuss sugar work, cover techniques for making candy. This course will also cover equipment, ingredients and trouble shooting for confection work. We will cover freezing, mixing and consistency for frozen dessert products.

CA 8.383 The Breads of France
(3 class hrs/wk, 3 cr)
An advanced bread class focusing on the techniques of the French Boulanger. This course will cover breads from cities of France and cover the techniques that make these breads unique. This course will also cover equipment, ingredients, and trouble shooting for the perfect loaf of French bread.

CA 8.384 Advanced Cakes & Pastries
(3 class hrs/wk, 3 cr)
An advanced cake and pastry cake course focusing on complex cake construction, Bavarians, mousses, decorating, and presentation techniques.

CA 8.385 Advanced Breads
(3 class hrs/wk, 3 cr)
An advanced bread class focusing on the ten steps of yeast production, and techniques for roll-in doughs, enriched doughs, pre-fermentation, sourdough, bagels, and flatbreads.

CA 8.409 Meats
(6 class hrs/wk, 3 cr) F
Addresses fabricating primal and sub-primal cuts of beef, pork and lamb for profitable use in restaurants. Includes knife techniques, portion cutting, and safe and sanitary meat handling and storage. Proper cooking procedures and techniques also are presented. Handling and tasting of meat products is an integral and required part of this class. Prerequisite: CA 103 Culinary Arts Practicum III.

CA 8.414 Presentation/Garde Manger
(4 class hrs/wk, 2 cr) Sp
Traditional and contemporary presentation techniques are presented and practiced as part of this hands-on class. Charcuterie, hors d'oeuvres, appetizers and patés are explored.

CA 8.418 Beverage Operations and Services
(4 class hrs/wk, 2 cr) F
Covers the art and science of beverage production, classifications, standards of identity, taste and characteristics, service and merchandising, costing and controls, standard glassware, sanitation, and federal and state ordinances.

CA 8.419 Nutrition and Special Diets
(2 class hrs/wk, 1 cr) F
Practical use of food and menus to assure a proper balance of both macronutrients (carbohydrates, fats, and proteins) and micronutrients. Meeting nutritional needs through the use of "new" and varied products is stressed. Main emphasis is placed on hands-on activities to expand students' ability to identify and use a variety of ingredients.

CA 8.421 International Cuisine
(4 class hrs/wk, 2 cr) W
Through lecture, projects, research and demonstration, students learn about the styles and flavoring components of a variety of national and regional cuisines. All reports, menus and projects will be completed using a word processing program.

CA 101 Culinary Arts Practicum I
(24 class hrs/wk, 7 cr) F
Practicum classes I, II, and III provide a comprehensive hands-on sequence designed to develop, through practice, the basic skills and attitudes necessary for a successful career in Food Service. Stations include Baking, Pantry, Garde Manger, Soups and Sauces, Entree Cookery, Vegetable Cookery, Healthy and Natural Foods, and Dining Room. High professional standards and attitudes are stressed. These practicums are designed for the serious career-oriented individual. Prerequisites: CA 111 Food Service Safety and Sanitation; CA 112 Stations, Tools and Culinary Techniques; and CA 113 Service Techniques.

CA 102 Culinary Arts Practicum II
(24 class hrs/wk, 8 cr) W
Practicum classes I, II, and III provide a comprehensive hands-on sequence designed to develop, through practice, the basic skills and attitudes necessary for a successful career in Food Service. Stations include Baking, Pantry, Garde Manger, Soups and Sauces, Entree Cookery, Vegetable Cookery, Healthy and Natural Foods, and Dining Room. High professional standards and attitudes are stressed. These practicums are designed for the serious career-oriented individual. Prerequisite: CA 101 Culinary Arts Practicum I.

CA 103 Culinary Arts Practicum III
(24 class hrs/wk, 8 cr) Sp
Practicum classes I, II, and III provide a comprehensive hands-on sequence designed to develop, through practice, the basic skills and attitudes necessary for a successful career in Food Service. Stations include Baking, Pantry, Garde Manger, Soups and Sauces, Entree Cookery, Vegetable Cookery, Healthy and Natural Foods, and Dining Room. High professional standards and attitudes are stressed. These practicums are designed for the serious career-oriented individual. Prerequisite: CA 102 Culinary Arts Practicum II.

CA 111 Food Service Safety and Sanitation
(10 class hrs/wk, 1 cr) F
Helps students gain an awareness of the hazards of poor sanitation and safety practices and how to properly address those issues. Through lecture, assigned reading and case study, students learn the essentials of food handling, proper personal hygiene, equipment handling and facilities management as they relate to the food service industry.

CA 112 Stations, Tools and Culinary Techniques
(20 class hrs/wk, 3 cr) F
A program orientation course providing students a thorough first exposure to the history of food service; the identification and use of common ingredients; professional work habits and attitudes; and to a basic understanding of equipment, knife handling techniques and culinary terms and methods. Note: Two-week class.

CA 113 Service Techniques
(10 class hrs/wk, 1 cr) F
Teaches the skills of dining room service by a combination of lecture, demonstrations and role playing. In addition, students learn the fundamentals of building customer relations.

CA 199 Special Studies
(2-10 class hrs/wk, 1-4 cr) As Needed
Special studies allows a student to investigate, with supervision from a faculty member, a topic of his/her interest at an individualized pace. Credits and projects will be determined jointly by the instructor and the student.

CA 201 Culinary Arts Career Planning
(2 class hrs/wk 1 credit) Sp
Prepare for entering the culinary workforce. Organize a search for work including preparation of a résumé for use in a mock interview, writing a letter of application, and completing a standard application form. Includes preparing a five year career plan and exploring different career opportunities using resources such as the Internet, industry periodicals, and employment department career information.

CE: CIVIL ENGINEERING TECHNOLOGY

CE 6.222 Introduction to Civil Engineering Technology
(2 class hrs/wk, 1 cr) F
Introduction to Civil Engineering Technology includes basic information on surveying and civil drafting.

CE 6.444 Civil Design Lab
(2 class hrs/wk, 1 cr) F
A course in civil engineering design. Emphasizes the design of roads, waterlines, sanitary sewer lines and storm drains. Prerequisites: EG 4.456 Civil Drafting Lab; WW 6.167 Water Distribution and Collections Lab.

CE 6.488 Advanced Surveying and Land Development
(6 class hrs/wk, 4 cr) F
Advanced course in surveying and land development. Emphasizes land and construction surveying and the process of developing land. Prerequisite: EG 4.456 Civil Drafting Lab; CEM 263 Plane Surveying.

CEM: CONSTRUCTION ENGINEERING MANAGEMENT

CEM 263 Plane Surveying
(4 class hrs/wk, 3 cr) Sp
Basic course in surveying techniques. Includes distance measuring, leveling, cross sectioning, traversing, topographic surveying, use of surveying instruments and office procedures. Prerequisite: MTH 111 College Algebra.

CG: COLLEGE SKILLS

CG 100 College Success Strategies
(3 class hrs/wk, 3 cr) As needed
Combines academic study skills with the personal success skills needed to be successful in a community college. Academic study skills are based on knowledge about how we learn and include note taking, reading and studying textbooks, and preparing for and taking tests. Personal success skills include strengthening personal responsibility, self-motivation, self-management, and self-advocacy. Prerequisite: CPT placement into RD 090 College Success & Reading Strategies. Recommended: CPT writing placement into WR 090 The Write Course.

CH: CHEMISTRY

CH 112 Chemistry for Health Occupations
● *(6 class hrs/wk, 5 cr) F/W*
Introductory topics in inorganic chemistry selected to prepare students entering Nursing, Emergency Medical Technician, Radiation Technicians and related Health Occupations programs. Prerequisite: High school algebra or equivalent, or MTH 60 Introduction to Algebra. This course includes a laboratory component.

CH 113 Chemistry for Health Occupations
● *(6 class hrs/wk, 5 cr) Sp*
Second term of a two-term sequence in introductory topics in organic and biological chemistry selected to prepare students entering Nursing, Emergency Medical Technician and related Health Occupations programs. Prerequisite: CH 112 Chemistry for Health Occupations and MTH 060 Introduction to Algebra. This course includes a laboratory component.

CH 121 College Chemistry
● *(7 class hrs/wk, 5 cr) As needed*
A general chemistry sequence for students who have had no previous training in chemistry. Entering students are expected to have a working knowledge of high school algebra, logarithms, and scientific notation. This is the first course of a three-term sequence for students in science-related fields, including health occupations, agriculture, animal science, fisheries and wildlife, life sciences, education, general science and earth sciences. Prerequisites: MTH 095 Intermediate Algebra or equivalent; high school physical science or equivalent. All prerequisites must be completed with a "C" or better. This course includes a laboratory component.

CH 122 College Chemistry
● *(7 class hrs/wk, 5 cr) As needed*
A general chemistry sequence for students who have had no previous training in chemistry. Entering students are expected to have a working knowledge of high school algebra, logarithms, and scientific notation. This is the second course of a three-term sequence for students in science-related fields, including health occupations, agriculture, animal science, fisheries and wildlife, life sciences, education, general science and earth sciences. Prerequisites: MTH 095 Intermediate Algebra and CH 121 College Chemistry. All prerequisites must be completed with a "C" or better. This course includes a laboratory component.

CH 123 College Chemistry
● *(7 class hrs/wk, 5 cr) As needed*
A general chemistry sequence for students who have had no previous training in chemistry. Entering students are expected to have a working knowledge of high school algebra, logarithms, and scientific notation. This is the third course of a three-term sequence for students in science-related fields, including health occupations, agriculture, animal science, fisheries and wildlife, life sciences, education, general science and earth sciences. Prerequisites: CH 122 College Chemistry with a grade of "C" or better. This course includes a laboratory component.

CH 150 Preparatory Chemistry
(3 class hrs/wk, 3 cr) F/Sp/Su
Introduces chemistry for science, engineering and the professional health occupations. Designed to meet the prerequisite for CH 221, this fast-moving curriculum covers the basic tools offered in a one-year high school chemistry course. A good selection for students who need a refresher in chemistry or have little or no background in chemistry and need to meet the prerequisite for CH 221. Topics emphasized include chemical calculations and problem-solving techniques encountered in both inorganic and organic chemistry. There is no lab with CH 150. Corequisite: MTH 095 Intermediate Algebra.

CH 199 Special Studies
● *(2–6 class hrs/wk, 1–3 cr) As needed*
Allows a student to investigate, with supervision from a faculty member, a topic of his/her interest at an individualized pace. Credits and projects are determined by the instructor and student.

CH 201 Chemistry for Engineering Majors I
● *(7 class hrs/wk, 5 cr) W*
This is the first course of a two term sequence of selected chemistry topics for pre-engineering students. Designed specifically to provide engineering majors a fundamental understanding of chemical reactions and scientific measurement. This course will introduce students to principles, laws and equations that govern our understanding of chemical combination. Prerequisite: Completion of high school chemistry with a grade of "C" or better with a passing score on the chemistry entrance exam, or CH 150 Preparatory Chemistry with a grade of "C" or better, or CH 121 College Chemistry with a grade of "C" or better, or CH 112 Chemistry for Health Occupations with a grade of "C" or better; MTH 095 Intermediate Algebra. Corequisite: MTH 111 College Algebra. This course includes a laboratory component.

CH 202 Chemistry for Engineering Majors II
● *(7 class hrs/wk, 5 cr) Sp*
This is the second course of a two-term sequence designed specifically to provide engineering majors with a fundamental understanding of chemical reactions and scientific measurement. This course will introduce students to principles, laws and equations that govern our understanding of chemical combination. Prerequisites: CH 201 Chemistry for Engineering Majors I, MTH 111 College Algebra with a grade of "C" or better. This course includes a laboratory component.

CH 221 General Chemistry
● *(7 class hrs/wk, 5 cr) F/W*
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. This is the first course of a three-term sequence for students in science, engineering and the professional health programs. Prerequisite: Completion of high school chemistry with a grade of "C" or better with a passing score on the chemistry entrance exam, or CH 150 Preparatory Chemistry with a grade of "C" or better, or CH 121 College Chemistry with a grade of "C" or better, or CH 112 Chemistry for Health Occupations with a grade of "C" or better; MTH 095 Intermediate Algebra. Corequisite: MTH 111 College Algebra. This course includes a laboratory component.

CH 222 General Chemistry
● *(7 class hrs/wk, 5 cr) W/Sp*
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. This is the second course of a three-term sequence for students in science, engineering and the professional health programs. Prerequisites: CH 221 General Chemistry with a grade of "C" or better; MTH 111 College Algebra with a grade of "C" or better. This course includes a laboratory component.

CH 223 General Chemistry
● *(7 class hrs/wk, 5 cr) Sp/Su*
A general chemistry sequence for students majoring in most sciences, pharmacy, and chemical engineering. This is the third course of a three-term sequence for students in science, engineering and the professional health programs. Prerequisite: CH 222 General Chemistry with a grade of "C" or better; MTH 111 College Algebra with a grade of "C" or better. This course includes a laboratory component.

CH 241 Organic Chemistry
● *(6 class hrs/wk, 4 cr) F*
The first course of a three-term sequence for students in the sciences, chemical engineering, and professional health programs. Topics include nomenclature, in-depth treatment of major classes of organic compounds, mechanisms and synthesis. Prerequisite: CH 121, 122 and 123 College Chemistry or CH 221, 222 and 223 General Chemistry with grades of "C" or better. This course includes a laboratory component. This course may be eligible for upper-division credit. For details, please see the program description for an Associate of Science with an emphasis in Chemistry.

CH 242 Organic Chemistry
● *(6 class hrs/wk, 4 cr) W*
The second course of a three-term sequence for students in the sciences, chemical engineering, and professional health programs. Topics include nomenclature, in-depth treatment of major classes of organic compounds, spectroscopy, mechanisms and synthesis. Prerequisite: CH 241 Organic Chemistry with a grade of "C" or better. This course includes a laboratory component. May be eligible for upper-division credit. For details, please see the program description for an Associate of Science with an emphasis in Chemistry.

CH 243 Organic Chemistry
● *(6 class hrs/wk, 4 cr) Sp*
The third course of a three-term sequence for students in the sciences, chemical engineering, and professional health programs. Topics include nomenclature, in-depth treatment of major classes of organic compounds, spectroscopy, mechanisms and synthesis. Prerequisite: CH 242 Organic Chemistry with a grade of "C" or better. This course includes a laboratory component. This course may be eligible for upper division credit. For details, please see the program description for an Associate of Science with an emphasis in Chemistry.

CH 280 CWE Chemistry
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Designed to give students practical experience through supervised employment related to chemistry. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

CH 299 Special Studies
(2–6 class hrs/wk, 1–3 cr) As needed
Allows a student to investigate, with supervision from a faculty member, a topic of his or her interest at an individualized pace. Credits and projects are determined by the instructor and student.

CIS: COMPUTER INFORMATION SYSTEMS

Courses with the CIS prefix are career and technical courses that have a primary purpose of meeting requirements for the Associate of Applied Science degree. Four-year institutions may or may not accept them for transfer credit.

CIS 125 Introduction to Software Applications
(4 class hrs/wk, 3 cr) F/W/Sp
Designed to use technology as a productivity tool within a business environment through the use and integration of various software packages. Students will use word processing software for formatting business correspondence, creating tables, multipage documents, graphical elements, mail merge, and other features. Spreadsheet software will be used to create formulas, use built-in functions for calculations, create charts and graphs, reference other worksheets, create absolute and relative cell references as well as other formatting and editing features. Presentations software will be used to produce, edit, and create visually compelling presentations for business outcomes. Prerequisite: MTH 060 Introduction to Algebra with a minimum "C" grade. CS 120 Digital Literacy with a minimum "C" grade or equivalent computer experience as determined by a Computer Systems Department advisor.

CIS 125D Introduction to Databases
(3 class hrs/wk, 1 cr) F/W/Sp
Introduces database software and how it is utilized in business and personal applications to organize information, produce reports, prepare data entry forms, and store data in retrievable format using filters and queries available in the software. Note: Five-week course. Prerequisite: Completion of CIS 120 Digital Literacy with a minimum "C" grade or equivalent computer experience as determined by a Computer Systems Department advisor.

CIS 135S Advanced Spreadsheets
(4 class hrs/wk, 3 cr) Sp
Provides advanced techniques and features of spreadsheet software for business applications and financial analysis. Uses the applications expected in the business environment, including but not limited to an operating budget, and following a company's stock price and other information. New concepts to be introduced include break-even analysis, financial projections, statistical analysis, and data and pivot tables to summarize data. Prerequisite: CIS 125S Introduction to Software Applications with a minimum "C" grade.

CIS 151 Networking Essentials
(7 class hrs/wk, 4 cr) F
The first course of a four-part sequence in a Cisco curriculum directed toward the Cisco Certified Network Associate certification (CCNA). Provides students with classroom and laboratory experience in current networking technology, and includes network terminology, protocols, network standards, LANs, WANs, OSI model, cabling, cabling tools, safety, network topology, and IP addressing. Corequisites: CIS 125 Introduction to Software Applications or equivalent computer experience as determined by a Computer Systems advisor, and MTH 095 Intermediate Algebra.

CIS 152 Network Router Configurations
(7 class hrs/wk, 4 cr) W
The second course of a four-part sequence in a Cisco curriculum directed toward the Cisco Certified Network Associate certification (CCNA). Emphasizes experience in current networking technology, and includes network terminology and protocols. Topics include LANs network topology, IP addressing, routers, router programming, and application of routing and router protocols. Prerequisite: CIS 151 Networking Essentials with a minimum "C" grade.

CIS 153 LANs and Internetwork Design
(7 class hrs/wk, 4 cr) Sp
The third course of a four-part sequence in a Cisco curriculum directed toward the Cisco Certified Network Associate certification (CCNA). Emphasizes experience in current networking technology that includes LAN segmentation, using bridges, routers, and switches to control network traffic. Includes advanced router configuration, LAN switching theory, and VLANs. Note: Five-week course. Prerequisite: CIS 152 Network Router Configurations with a minimum "C" grade.

CIS 154 WAN Design
(7 class hrs/wk, 4 cr) Sp
The fourth course of a four-part sequence in a Cisco curriculum directed toward the Cisco Certified Network Associate certification (CCNA). Introduces WAN services. Covers ISDN, ATM, frame relay, and dial-up services. Note: Five-week course. Prerequisite: CIS 153 LANs and Internetwork Design with a minimum "C" grade.

CIS 195 Web Development I
(5 class hrs/wk, 4 cr) Sp
Introduces web design through an examination of (X)HTML, CSS and relevant computer graphic file formats. Students will learn to create standards-compliant, accessible Web pages using modern design techniques and technologies. Emphasis will be placed on learning to write (X)HTML and CSS script without the help of advanced Web design software; writing accessible, standards-compliant code; and separating content, presentation and action. Prerequisite: CIS 125H Introduction to HTML with a minimum "C" grade or instructor approval.

CIS 196 Web Development II
(5 class hrs/wk, 4 cr) W
Introduces students to advanced Web design techniques through an in-depth examination of (X)HTML, CSS and JavaScript and JavaScript Libraries. Students will learn to use WYSIWIG software packages for HTML development. Asynchronous JavaScript and XML (Ajax) programming Advanced JavaScript techniques will be examined, along with common, powerful JavaScript libraries designed to aid the Web developer. Prerequisite: CS 133J JavaScript with a minimum "C" grade or instructor approval.

CIS 295 Web Development Using the Microsoft Stack
(5 class hrs/wk, 4 cr) W
Provides students with hands-on experience using Microsoft technologies to create Web pages and Web applications. Prerequisite: CS 233S Programming in C# II with a minimum "C" grade.

CIS 296 Web Development Using Open-Source Software
(5 class hrs/wk, 4 cr) W
Provides students with hands-on experience developing dynamic Web applications using selected Open-Source operating systems such as Linux, Web servers such as Apache, databases such as MySQL, programming languages such as PHP and Python, and development frameworks. Prerequisites: CS 140U Fundamentals of Linux/UNIX, , CS 161 Introduction to Computer Science (Java), CIS 195 Web Development I, all with a minimum "C" grade, or equivalent as determined by the instructor. Corequisite: CS 275 Database Systems: SQL and Oracle.

CJ: CRIMINAL JUSTICE

CJ 100 Survey of Criminal Justice Systems
■ *(3 class hrs/wk, 3 cr) As needed*
Introduction to how the criminal justice system operates. Explores how someone enters the criminal justice system and how the various subcomponents of this system operate together.

CJ 101 Introduction to Criminology
■ *(3 class hrs/wk, 3 cr) As needed*
Presents an overview of criminology, research, data gathering and analysis. Introduces theoretical perspectives on the nature of crime, criminals and victimization and identifies current trends and patterns of crime. Development and conceptualization of crime, including historical perspectives, social and legal definition and classifications.

CJ 110 Introduction to Law Enforcement
■ *(3 class hrs/wk, 3 cr) As needed*
Introduces students to the law enforcement profession. The historical development of policing in America, the police role, and the various branches and divisions of law enforcement are examined, as well as corruption and stress. The social dimensions of policing in America are also examined so students will know the hazards of the profession, yet gain a broader perspective of the professional requirements in their chosen field.

CJ 112 Police Field Operations
■ *(3 class hrs/wk, 3 cr) As needed*
Introduces the nature and purpose of patrol activities, including routine and emergency procedures, types of patrol, arrest procedures and field interviews. Covers equipment, technology and vehicle operation. Emphasizes report documentation, courtroom testimony and police tactical communications.

CJ 120 Introduction to the Judicial Process
■ *(3 class hrs/wk, 3 cr) As needed*
Surveys the process of justice from arrest through rehabilitation; the jurisdiction of city, county, state and federal police agencies; and the constitutional rights of individuals using the medium of the mock trial. Students study, investigate and present a criminal trial, acting as "lawyers," witnesses and investigators.

CJ 130 Introduction to Corrections
■ *(3 class hrs/wk, 3 cr) As needed*
Examines the total correctional process from law enforcement through administration of justice, probation, prisons and correctional institutions, and parole. History and philosophy oriented.

CJ 132 Introduction to Parole and Probation
(3 class hrs/wk, 3 cr) As needed
Introduces the use of parole and probation as a means of controlling felons. Covers contemporary functioning of parole and probation agencies.

CJ 140 Criminalistics
(3 class hrs/wk, 3 cr) As needed
Criminalistics, also called "forensic science," applies the knowledge and technology of science to the solution of crime. This course includes a review of the principles and techniques used to collect and analyze physical evidence found at a crime scene, fingerprints, voice and bodily fluid identification, forensic entomology and autopsies. Also includes an examination of the legal and ethical issues associated with forensic work.

CJ 198 Research Topics
(1 class hr/wk, 1 cr) As needed
Students examine in depth a selected criminal justice topic. Develops skills in independent research. Corequisite: WR 123 English Composition: Research Paper.

CJ 201 Juvenile Delinquency
■ *(3 class hrs/wk, 3 cr) As needed*
Explores delinquency in American society. Theories, families, gangs, and a study of youth violence help provide students with an understanding of the social and institutional context of delinquency. Students work cooperatively as team members to teach others in the class about a research topic related to a juvenile delinquency issue.

CJ 202 Violence and Aggression
■ *(3 class hrs/wk, 3 cr) As needed*
Explores and analyzes violence and aggression from biological, psychological and sociological perspectives. Includes topics such as homicide, suicide, rape, assault, mob violence, terrorism, violence within the family and related phenomenon, which are presented from a human relations perspective.

CJ 203 Crisis Intervention Seminar
(1 class hrs/wk, 1 cr) As needed
An overview of the techniques and approaches to crisis intervention for entry-level criminal justice professions. Covers initial intervention, defusing and assessment, resolution and/or referral, with emphasis on safety. Includes personal effectiveness, recognition of threat levels, voluntary compliance, verbal and nonverbal communication, active listening and mediation.

CJ 210 Introduction to Criminal Investigation
(3 class hrs/wk, 3 cr) As needed
Introduces the fundamentals of criminal investigation theory and history, from the crime scene to the courtroom. Emphasizes techniques appropriate to specific crimes.

CJ 211 Ethical Issues in Law Enforcement
(3 class hrs/wk, 3 cr) As needed
The law enforcement community has an established code of ethics embedded in all professional activities. This course provides an overview of ethics theory as it applies to the criminal justice professional. This course also focuses on practical and ethical solutions to common dilemmas experienced by those working in law enforcement.

CJ 220 Introduction to Substantive Law
■ *(3 class hrs/wk, 3 cr) As needed*
Surveys the historical development and philosophy of law and constitutional provisions; the definition and classification of crimes and their application to the system of administration of justice; and the legal research, case law and concepts of law as a social force.

CJ 222 Procedural Law
(3 class hrs/wk, 3 cr) As needed
Reviews the evolution and status of U.S. case law relating to search and seizure, warrants, arrests, self-incrimination, right to counsel, Miranda, and other issues arising out of the U.S. Constitution relevant to the function of law enforcement professionals.

CJ 226 Constitutional Law
(3 class hrs/wk, 3 cr) As needed
Focuses on the study of the fundamentals of the U.S. Constitution, including the separation of power; the structure of the federal court system; preemption; the Bill of Rights and subsequent amendments; U.S. case law and its relation to law enforcement; and the effects of constitutional limitations on police power.

CJ 230 Introduction to Juvenile Corrections
(3 class hrs/wk, 3 cr) As needed
Designed to introduce students to the profession of juvenile corrections, the history of juvenile corrections, juvenile court philosophy and treatment modalities. Provides students with an understanding of the political, social, and economic environment operating within the juvenile correctional system. Students will also gain knowledge on how to complete a professional job search process.

CJ 232 Introduction to Corrections, Counseling and Casework
(3 class hrs/wk, 3 cr) As needed
Reviews the corrections system today combined with an overview of basic counseling techniques.

CJ 243 Drugs, Crime and Addiction
(3 class hrs/wk, 3 cr) As needed
Introduces students to the social and legal issues surrounding drug abuse and examines the political considerations behind contemporary drug enforcement policy. Reviews policies and procedures of the federal Drug Enforcement Administration and other federal agencies involved in drug interdiction. Examines modern drug abuser rehabilitation theory.

CJ 250A Criminal Justice Capstone – Job Search and Interviewing
(1 class hr/wk, 1 cr) As needed
The first of three capstone courses in the Criminal Justice Department. This course is designed to instruct the student in interview techniques, job search strategies, and interviewer characteristics specific to law enforcement and corrections, and it identifies common mistakes made by applicants. May be taken concurrently with CJ 250B and CJ 250C. This course must be passed with a grade of "C" or better.

CJ 250B Criminal Justice Capstone – Written Communication
(1 class hr/wk, 1 cr) As needed
The second of three capstone courses in the Criminal Justice Department. This course is designed to assess and improve writing skills and to provide instruction on writing professional police reports, memoranda and documents used in the courtroom. May be taken concurrently with CJ 250A and CJ 250C. This course must be passed with a grade of "C" or better.

CJ 250C Criminal Justice Capstone – Rules and Regulations
(1 class hr/wk, 1 cr) As needed
The third of three capstone courses in the Criminal Justice Department. This course will feature speakers from various law enforcement and corrections agencies; review of Oregon statutory law and Oregon Administrative Rules as they relate to law enforcement and corrections professionals; examination of the Oregon Physical Agility Test (ORPAT); background investigations; dealing with the public and legal liability of law enforcement and corrections professionals. May be taken concurrently with CJ 250A and CJ 250B. This course must be passed with a grade of "C" or better.

CJ 280A CWE Corrections
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to corrections. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. CWE coordinator's approval required.

CJ 280B CWE Law Enforcement
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to law enforcement. Students identify job performance objectives, work a specified number of hours during the term and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. CWE coordinator's approval required.

COMM: COMMUNICATION

COMM 100 Introduction to Speech Communication
(3 class hrs/wk, 3 cr) W/Sp
Survey course covering the complexities of the communication process and the impact of communication on obtaining employment. Includes insights into the causes and effects of general communication behaviors, involvement in active exploration of basic communication theories and concepts, and opportunities to develop communication strengths.

COMM 111 Fundamentals of Speech
(3 class hr/wk 3 cr) F/W/Sp/Su
Provides the opportunity to discuss and understand the nature of public speaking and discourse in both ancient and modern society, and to create, adapt and deliver original speeches before an audience. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

COMM 112 Introduction to Persuasion
(3 class hrs/wk, 3 cr) F/W/Sp
Studies the theory and practice of persuasion and persuasive techniques. Students learn to analyze, develop and present persuasive messages. Introduces the nature and logic of reasoning, persuasive propositions, issues and claims, the use of evidence and rational discourse. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

COMM 199 Special Studies in Speech
(3–9 class hrs/wk, 1–3 cr) F/W/Sp/Su
Offers individual and special studies arranged with an instructor. Note: May be repeated for a maximum of nine credits.

COMM 218 Interpersonal Communication
(3 class hrs/wk, 3 cr) F/W/Sp/Su
Introduces students to various aspects of the communication process in one-to-one relationships. Emphasis is placed on enhancing personal and professional relationships by expanding knowledge, increasing understanding and developing practical skills necessary for competent communication. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

COMM 280 CWE Speech
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to speech. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

COMM 280S Service-Learning Speech
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
An instructional program, using contextual learning, designed to promote critical thinking, citizenship and civic responsibility as students work with community partners in addressing real community needs. Students identify learning objectives, work a specified number of hours during the term, and engage in faculty-led guided reflection activities. Prerequisites: Students must have taken or must be currently taking appropriate course or courses in their major field of study. They must also have their service-learning approved by the appropriate faculty coordinator.

CS: COMPUTER SCIENCE

CS 120 Digital Literacy
(4 class hrs/wk, 3 cr)F/W/Sp
Designed as a survey course to familiarize students with computer concepts including software and hardware, software applications, and living online leading towards digital computer literacy. Introduces students to Windows file management, Internet and email concepts and techniques including professionalism and etiquette, word processing, spreadsheet software, and presentation graphics skills in a hands-on setting.

CS 133C Programming in C
(5 class hrs/wk, 4 cr) W
Introduces problem analysis and programming to solve computation problems. Introduces the C language for those with previous programming experience. CS 161 Introduction to Computer Science I Java with a minimum "C" grade or equivalent experience as determined by a Computer Systems Department advisor; MTH 095 Intermediate Algebra or higher.

CS 133J JavaScript
(5 class hrs/wk, 4 cr) F
For the Web developer already familiar with HTML and CSS who wants to add interactivity, error checking, simple animations and special effects via client-side scripting. Prerequisite: CIS 195 Web Development I with a minimum "C" grade or equivalent HTML experience as determined by a Computer Systems Department instructor.

CS 133S Programming in C# I
(5 class hrs/wk, 4 cr) Sp
Introduces C# (C-sharp) for those with prior programming experience. Introduces the Microsoft .NET Framework and Visual Studio Integrated Development Environment. Includes the basic syntax of C# as well as objects, arrays, and basic data structures. Prerequisite: CS 161 Introduction to Computer Science I with a minimum "C" grade and MTH 095 Intermediate Algebra or higher.

CS 140M Operating Systems I: Microsoft
(4 class hrs/wk, 3 cr) F
A workbench course that provides experience with common computer software tasks in a Microsoft Windows operating system environment. Emphasizes troubleshooting, problem solving, and building skills in computer user support. Includes registry patches, technical support and installations such as printer sharing and client deployment. Prerequisite: CIS 125S Introduction to Software Applications, CIS 151 Networking Essentials, both with a minimum "C" grade.

CS 140U Fundamentals of UNIX/Linux
(5 class hrs/wk, 4 cr) Sp/Su
A laboratory-intensive course that provides new users with an introduction to the Linux® operating system. Students will install and administer their own Linux® systems, primarily using professional command-line tools. Topics will include file system navigation and permissions, text editors, shell scripting and network-oriented utilities. The course provides partial preparation for the Linux+® exam. Prerequisite: MTH 095 and CIS 151 Networking Essentials, both with a minimum "C" grade.

CS 160 Orientation to Computer Science
(5 class hrs/wk, 4 cr) F/W/Sp
Introduces the field of computer science and programming. Covers binary encoding of data, digital logic, computer organization, operating systems, programming languages, algorithms, control structures, and software engineering. Intended for students who wish to investigate a career in computer science and related fields. Corequisite: MTH 095 Intermediate Algebra and CIS 125 Introduction to Software Applications.

CS 161 Introduction to Computer Science I (Java)
(5 class hrs/wk, 4 cr) F/W/Sp
Introduces the principles of computer programming using an object-oriented language. Includes problem-solving concepts, verification and validation, representation of numbers, sources of errors, debugging techniques, conditionals, loops, and arrays. The Java programming language is used. Corequisites: CS 160 Orientation to Computer Science. Prerequisite: MTH 095 Intermediate Algebra or higher with a minimum "C" grade.

CS 162 Introduction to Computer Science II (Java)
(5 class hrs/wk, 4 cr) W/Sp
Covers software engineering principles, basic data structures and abstract data types (arrays, strings, stacks, queues and graphics). Introduces analysis of algorithms, sorting and searching. Expands on Graphical User Interfaces, Swing components, layout managers and event-driven programming. Also covers polymorphism, inheritance, recursion and exceptions. The Java programming language is used. Prerequisite: CS 161 Introduction to Computer Science I (Java) with a minimum "C" grade.

CS 225 End User Computing Support
(4 class hrs/wk, 3 cr) F/Sp
Presents the interpersonal skills that are so important in the modern workplace. Topics include communicating effectively, appropriate business place behavior and etiquette, teamwork, conflict resolution, work ethics, creative thinking and problem solving, interviewing skills and personal management. Students will gain awareness of individual work styles and how to work effectively with people with different styles in a diverse workplace. Class activities and assignments will stress practical application of skills.

CS 233S Programming in C#II
(5 class hrs/wk, 4 cr) W
A continuation of the study of the C# (C-sharp) programming language and the .NET framework. Introduces an examination of LINQ, lambda expressions, data structures and advanced framework options. Prerequisite: CS 133S Programming in C++I with a minimum "C" grade.

CS 240A Microsoft Windows® Server Administration I
(5 class hrs/wk, 4 cr) W
The first of three courses in the administration of Microsoft Windows® client/server networked operating systems. The courses CS 240A, CS 240B, and CS 240C are laboratory-intensive courses that provide hands-on experience in the planning, installation and administration of Microsoft Windows® client/server networks. The three courses provide partial preparation for the MCSA® exams. Prerequisites: CIS 140U Fundamentals of UNIX/Linux, or CIS 140M Operating Systems I: Microsoft, all with minimum "C" grades.

CS 240B Microsoft Windows® Server Administration II
(5 class hrs/wk, 4 cr) Sp
The second of three courses in the administration of Microsoft Windows® client/server networked operating systems. The courses CS 240A, CS 240B, and CS 240C are laboratory-intensive courses that provide hands-on experience in the planning, installation, and administration of Microsoft Windows® client/server networks. The three courses provide partial preparation for the MCSA® exams. Prerequisite: CS 240A Microsoft Server Administration I with a minimum "C" grade.

CS 244 Systems Analysis and Project Management
(4 class hrs/wk, 3 cr) W
A practice-oriented course with examples, applications and proven techniques that demonstrate, project management, systems analysis and design. Actual organization, business settings, and project management software are used to show how systems concepts can apply to many different types of enterprises.

CS 260 Data Structures (Java)
(5 class hrs/wk, 4 cr) Sp
Includes the topics of complexity analysis, sorting, searching, trees, binary search trees, heaps, and hash tables. Prerequisite: CS 162 Introduction to Computer Science II with a minimum "C" grade.

CS 271 Computer Architecture and Assembly Language
(4 class hrs/wk, 4 cr) F
Introduces functional organization and architecture of digital computers. Topics include digital logic; machine arithmatec and logical functions; component construction and interconnection. Coverage of assembly language: addressing, stacks, argument passing, arithmetic operations, decisions, and modularization is also provided. Prerequisites: CS 161 Orientation to Computer Science I with a minimum "C" grade.

CS 275 Database Systems: SQL and Oracle
(5 class hrs/wk, 4 cr) W
Introduces the design, purpose and maintenance of a database system. Covers the entity-relationship model, relational systems, data definition, data manipulation, query language (SQL) and the Oracle database management environments. Prerequisites: CS 160 Orientation to Computer Science with a minimum "C" grade and at least one programming class.

CS 276 Database Systems: PL/SQL
(5 class hrs/wk, 4 cr) Sp
Fundamentals of the programming procedural language extension to SQL. Areas of concentration include: PL/SQL structures, Boolean logic, stored procedures, functions and packages, blocks and nested blocks, triggers and error checking. Students will design and construct a database, then write programs in the procedural code (PL) to manipulate the data in an efficient, results-oriented manner. Prerequisite: CS 275 Database Systems: SQL and Oracle with a minimum "C" grade.

CS 279 Network Management
(5 class hrs/wk, 4 cr) F
Through the use of lectures, reading and hands-on practice, students learn to administer a Network Operating System. Topics include creating Directory objects, Domain Name Systems, assigning permissions, network file systems, network printer setup and router/firewall setup. Prerequisite: CIS 125 Introduction to Software Applications, CIS 151 Networking Essentials, CS 140U Fundamentals of UNIX®/LINUX®, all with minimum "C" grades.

CS 280 CWE Computer Systems
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to computer systems. Students identify job performance objectives, work a specified number of hours during the term and attend a related CWE seminar. Minimum of 24 credit hours in the program. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

CS 284 Introduction to Computer Security and Information Assurance
(5 class hrs/wk, 4 cr) Sp
This introductory course deals with the fundamental basic principles and surveys modern topics in computer security. It covers privacy concerns, policies and procedures, hardware security, software security, network security, and data security. Multi-level security, Public Key Infrastructure (PKI) and access control are discussed along with an introduction to cryptography. Prerequisite: MTH 095 Intermediate Algebra with a minimum "C" grade and CS 160 Orientation to Computer Science with a minimum "C" grade.

CS 2.589 Reading and Conference: Computer Systems
(1–20 class hrs/wk, 1–10 cr) As needed
Individualized course covering subject areas of particular interest to the student or areas where additional work is needed. Note: Number of credits is determined by amount of time spent and agreed upon in advance by instructor. Prerequisite: Instructor's approval.

CSS: CROP SCIENCE

CSS 200 Crops in Our Environment
(3 class hrs/wk, 3 cr) F
The class offers an introduction to the concepts of agricultural ecology and crop morphology. It serves as a foundation for other crop science classes. Examines the dynamics and function of crop communities, and the biotic and environmental interactions that influence crop productivity. Fundamentals of the developmental morphology of crop seeds, seedlings, and plants are covered as well as morphological features of seeds and plants in relation to the identification of crop families and species of economic importance.

CSS 205 Soils: Sustainable Ecosystems
(6 class hrs/wk, 4 cr) F
Explores the soil ecosystems as a medium for plant and crop growth, the cycling of nutrients, supply and purification of water, and a habitat for diverse population of soil organisms. Also studies the relationship of human activities to the sustainability of soil ecosystems.

CSS 210 Forage Crops
(4 class hrs/wk, 3 cr) Sp
Emphasizes practices that produce maximum economic returns for land devoted to hay, pasture or range. Includes establishment and management, fertilization, pest control, rotations, irrigations and renovation. Note: This is a career and technical course that may not be accepted by four-year institutions.

CSS 215 Soil Nutrients and Plant Fertilization
(4 class hrs/wk, 3 cr) W
An introduction to the essential soil nutrients and their use in agronomic and horticultural crops. Processes in the soil nutrient supply and plant nutrient uptake are discussed. Students become familiar with common synthetic and organic fertilizers and soil amendments and learn how to apply fertilizers using various application methods. Environmentally sound use and holistic management of agricultural nutrients are emphasized.

CSS 240 Pest Management
(4 class hrs/wk, 4 cr) F
An introduction to the classification, structure, growth, life cycles, recognition, and control principles of selected weeds, insects, disease, and other pests of plants. The principles and applications of Integrated Pest Management are emphasized.

CT: CONSTRUCTION AND FORESTRY EQUIPMENT TECHNOLOGY

CT 3.123 Fundamental Shop Skills
(4 class hr/wk, 3 cr) F
Give the student practical working knowledge of safety in the trade areas of employment. It uses safety regulatory agencies as a foundation, and also includes forklift training. Students will complete online training specific to safety and pollution prevention. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies and MTH 020 Basic Mathematics or higher, and instructor's approval required.

CT 3.129 Heavy Equipment/Diesel Engines
(12 class hrs/wk, 1–7 cr) W
This section of the program pertains to the operating principles, maintenance, repair and overhaul of various types and sizes of diesel engines. Diesel engines, their component parts, and related accessories are studied in depth. In conjunction with this is the study of manufacturers' specifications as they pertain to correct engine operation, performance and emissions. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

CT 3.130 Heavy Equipment/Diesel Tune-Up
(20 class hrs/wk, 1–10 cr) Sp
A capstone class that introduces diesel tune-up and techniques for optimum engine performance, including diagnostic troubleshooting, engine break-in procedure through use of the dynamometer. Students will use all of the critical thinking skills they have learned in past classes to solve real world problems on mechanical and computer managed engines and trucks. This class also includes the ITS Diesel Club. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics, and instructor's approval required.

CT 3.132 Advanced Mobile Hydraulics
(8 class hrs/wk, 5 cr) Sp
Covers advanced hydraulic theory along with service and repair of valves, pumps, motors and connectors used in mobile equipment hydraulic systems. Systems design and modification will be covered. Machine systems will be taught using hydraulic schematic drawings. Common customer concerns with specific heavy equipment and their solutions will be learned. Operational check-out and laptop computer testing of heavy equipment will be performed in labs, as well as repair and adjustment and electronic controls. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, CT 3.134 Basic Hydraulics and instructor's approval required.

CT 3.134 Basic Hydraulics
(5 class hrs/wk, 3 cr) W
This course covers hydraulic theory along with pump, actuator application, and valve design and theory. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies and instructor's approval required.

CT 3.146 Pneumatic Brakes and Controls
(10 class hrs/wk, 1–5 cr) W
Acquaints the student with the theory and application of pneumatic braking systems. The student will learn to service, diagnosis and repair ABS, foundation, accessory and safety air systems. Prerequisite: Placement test at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

CT 3.295 Power Train Systems
(20 class hrs/wk, 1–10 cr) F
Studies include power train terminology, theory and operation, driveshaft function and construction, maintenance practices, power train schematics, troubleshooting and failure analysis, and component rebuild and replacement. Students will use electronic resources such as John Deere Service Advisor and CAT SIS technical manuals to perform required tasks. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

CT 3.296 Steering, Suspension and Brakes
(10 class hrs/wk, 1–5 cr) Sp
Covers the theory and operation of heavy-duty steering and suspension systems, alignment and brakes. Diagnostic and service techniques are taught with the use of components and vehicles. Learning strategies include multimedia presentations, discussion, research and lab practice. Prerequisite: Placement test scores for RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

CT 3.297 Electrical and Electronic Systems
(20 class hrs/wk, 1–10 cr) F
Introduces the theory, application and diagnosis of the electrical and electronic control systems for modern vehicles. Emphasis will be placed on batteries, starting, charging, lighting, accessories and driver information systems. Preparation for ASE certification in electrical/electronic systems. Prerequisite: Placement test scores for RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

CT 3.303 Mobile AC and Comfort Systems I
(5 class hrs/wk, 3 cr) Sp
Principles of mobile heating and air conditioning systems with an emphasis on design, function, adjustment, service and testing of components. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, CT 3.297 Electrical and Electronic Systems and instructor's approval required.

CT 3.643 Customer Service
(2 class hr/wk, 2 cr) F
Designed to help students develop outstanding customer service skills in a dealership setting serving clients/customers. Students will learn how to interact with customers (communicating in person), resolve conflicts, maintain records, understand the importance of customer satisfaction/retention, actively participate as a member of a team, and develop time management skills. Prerequisite: Placement test scores for RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

DA: DENTAL ASSISTANT

DA 5.453 Dental Pathology/Pharmacology
(2 class hrs/wk, 2 cr) W
The study of oral pathology will cover the recognition of gross symptoms of oral disease, the treatment procedure and the prevention of oral disease to include the drugs and medications most commonly associated with treatment. An in-depth study of pathological diseases, normal and injured tissues, developmental anomalies, dental caries, abscesses and cysts will be discussed. Prerequisites: DA 5.500 Dental Anatomy and Histology and DA 5.502 Basic Science for Dentistry.

DA 5.461 Dental Radiology I
(4 class hrs/wk, 3 cr) F
An introduction to the principles and hazards of radiation, exposing and processing films, visual identification of anatomical landmarks, operation of X-ray equipment, including safety factors for patient and operator. Prerequisite: Admission to the Dental Assistant Program.

DA 5.462 Dental Radiology II
(4 class hrs/wk, 3 cr) W
A continuation of DA 5.461. An in-depth study of X-ray and patient considerations, increased skills including exposures of X-rays on mannequins and patients. Students will participate in exposing, processing and mounting dental radiographs. Other radiographic methods will include extraoral, panoramic, endodontic, pedodontic, occlusal and disto-oblique techniques. Prerequisites: DA 5.461 Dental Radiology I.

DA 5.463 Dental Radiology III
(2 lab hrs/wk 1 cr) Sp
Advanced X-ray clinical application of dental radiographic procedures and skills proficiency for periapical and bitewing X-rays. Students will expose radiographs on patients in the radiology labs. Emphasis is placed on identification of errors and corrective techniques.

DA 5.484 Dental Materials I
(4 class hrs/wk, 3 cr) F
An introduction to laboratory applications in the handling and manipulating of dental materials is designed to improve proficiency and efficiency at chairside procedures, emphasis on principles of physical and chemical properties of gypsum, impressions materials, waxes, custom trays and basic principles and asepsis of laboratory procedures, including fixed prosthetic materials and gold products. Precautions and safe handling of dental laboratory materials will be presented through use of Material Safety Data Sheets (MSDS). Prerequisite: Admission to the Dental Assistant Program.

DA 5.485 Dental Materials II
(4 class hrs/wk, 3 cr) Sp
An introduction to the diverse materials used in the dental office. The physical and chemical properties of bases, adhesives, cements, anticariogenic agents, and restorative materials in reference to manipulation and usage. Precautions and safe handling of dental materials will be presented through the use of Material Safety Data Sheets (MSDS). Prerequisites: DA 5.500 Dental Anatomy and Histology, DA 5.494 Introduction to Dentistry, DA 5.484 Dental Materials I.

DA 5.488 Expanded Duties I
(4 class hrs/wk, 3 cr) F
A study of procedures beyond the scope of general chairside assisting. The Oregon Dental Practice Act allows for instruction in placement and removal or matrix retainers, placement of temporary restorations, coronal polishing and fluoride treatments, and methods of fitting and adjusting permanent crowns. Also includes techniques to acquire skills for placing and removing rubber dams, taking alginate impressions, and taking bite registrations for study model articulation. Emphasis is on patient care and post operative instructions.

DA 5.489 Expanded Duties II
(3 class hrs/wk, 2 cr) Sp
A continuation of DA 5.488. This course will complete the remaining expanded function duties that are approved by the Oregon Dental Practice Act. An in-depth study with major emphasis on student practical application and fabrication of temporary crowns, cement removal techniques, placement of temporary soft denture relines, pit and fissure sealants, and amalgam polishing. Use of correct hand and motion techniques, selection of armamentarium, recognition of polishable amalgam restorations, and safety precautions for patient comfort are emphasized. Prerequisite: DA 5.488 Expanded Duties I.

DA 5.491 Dental Office Records and Emergencies
(2 class hrs/wk, 2 cr) W
Basic office principles as related to their application in a dental office. Patient reception, communication, and telephone techniques, appointment scheduling, office record maintenance, financial arrangements and coordination. Purchasing and supply control, management of office equipment, scheduling of meetings/conferences and preparing written communications. Billing insurance companies, collection procedures and computerized billing systems are covered in depth.

Provides familiarization with various emergency situations that may occur in a dental office and the primary first aid choice. The signs and symptoms of medical emergency, the equipment, treatments and drugs are discussed. Emphasis is placed on the responsibility of the dental team to be prepared for an emergency. CPR re-certification will be included within this course if needed. Prerequisite: Second-Term Status

DA 5.494 Introduction to Dentistry
(4 class hrs/wk, 3 cr) F
An introduction to clinical dentistry. Emphasis is placed on dental health team members, historical developments, introductory terminology, office communications, ethics and jurisprudence, dental practice acts, work ethics and patient management. Treatment room preparation, health history data collection, dental equipment identification, aesepsis and disinfection, preset trays, operator positioning, basic instruments, instrument transfer, oral charting, general office routine, productivity, marketing and performance appraisals are covered in detail. A brief introduction to dental specialties will be presented to include all aspects of dental care available to the public. Prerequisite: Admission to Dental Assisting program.

DA 5.495 Clinical Practice
(6 class hrs/wk, 4 cr) W
A continuation of DA 5.494. Principles of operative dentistry and fixed prosthetics are covered in detail, the order of procedure, hand and rotary instrumentation, anesthesia, handpieces, isolation and control of the operative field and post operative instructions are acutely emphasized. Prerequisite: DA 5.494 Introduction to Dentistry.

DA 5.496 Dental Specialties
(2 class hrs/wk, 2 cr) Sp
Dental specialties, role of dental auxiliaries, specialized instrumentation, materials and equipment will be encompassed to demonstrate a thorough knowledge of the following Dental Specialty Practices: Endodontics, Pedodontics, Prosthodontics, Periodontics, Oral Surgery, Orthodontics and Implant Surgery. The student will participate in three separate specialty practices during this term.

DA 5.497 Dental Health Education and Nutrition
(2 class hrs/wk, 2 cr) F
Development of concepts and principles of plaque related diseases, fluoride therapy, brushing and flossing techniques, patient education, including oral hygiene, preventative dentistry, and motivational techniques. In addition nutritional information applied to good oral health, including the food pyramid, nutrients, food diaries, and nutritional deficiencies as they relate to dental conditions. Basic principles of prevention of oral disease through patient and public education are stressed. Student community projects emphasize the principles of communication and preventative dentistry. Prerequisite: Admission to the Dental Assistant Program

DA 5.500 Dental Anatomy and Histology
(2 class hrs/wk, 2 cr) F
An in-depth study of dental terminology as it relates to normal anatomy, physiology and histology of the teeth and associated structures, their embryological development and histological characteristics, the function of oral structures. The universal numbering system for individual teeth is used in extensive detail, surfaces and comparison of similarities and differences of all teeth. Prerequisite: Admission to the Dental Assistant program.

DA 5.501 Dental Infection Control and Sterilization
(2 class hrs/wk, 2 cr) F
An in-depth study of principles in dental infection control, decontamination, disinfection and sterilization. This course will provide basic requirements for OSHA's blood borne pathogens, hazard communication and general safety standards in a dental environment, and includes sterilization principles, machines and techniques. Students will be eligible to take the infection control examination (ICE) administered by the Dental Assisting National Board (DANB) upon successful completion of this course. Prerequisite: Admission to the Dental Assistant program.

DA 5.502 Basic Science for Dentistry
(2 class hrs/wk, 2 cr) F
Provides a generalized overview of basic science as it relates to normal anatomy and physiology of the body and associated structures. Basic principles and terminology will be used to assist the student with the more detailed studies of oral anatomy/pathology. Focus will be on location, structure and function of the body with more integrated detail in landmarks, anatomy and physiology of the head and neck area. Prerequisite: Acceptance into the Dental Assistant program.

DA 5.510 Office Practicum I
(13 class hrs/wk 4 cr) W
The dental assisting student is provided with work experience that places practical application of all clinical skills in community dental offices. A total of 130 hours in one general dentistry office. Emphasis is placed on the individual's ability to work in a dental health setting with minimal direction. Prerequisite: Successful completion of all Dental Assistant Program Fall courses with a high level of competency, as set by the Dental Assistant Department.

DA 5.511 Office Practicum II
(13 class hrs/wk 4 cr) Sp
The dental assisting student is provided with work experience that places practical application of all clinical skills in community dental offices. A total of 130 hours in a second general dentistry office. Emphasis is placed on the individual's ability to work in a dental health setting with minimal direction. Prerequisite: Successful completion of all Dental Assistant Program Fall and Winter courses with a high level of competency, as set by the Dental Assistant Department.

DA 5.515 Office Practicum Seminar
(2 class hrs/wk, 2 cr) Sp
A series of weekly seminars in which students share work related experiences with the instructor and peers. Information regarding employment, skills improvement, job applications, résumé formats and interviewing techniques are covered as well as preliminary reviewing and testing for the national certification examination. Prerequisite: Successful completion of DA 5.510 Office Practicum I, and second term status.

DA 5.550 Human Relations in Dentistry
(2 class hr/wk, 2 cr) Sp
An introduction to human relations as they pertain to success in a dental setting (as well as personal lives) utilizing methods of dealing with stress, motivation, behavioral management and problem solving for personal growth. In addition, social perception, emotions and hiEC: economics storical elements of psychology of interpersonal relationships, including self-concept, emotion, gender, culture and cultural diversity issues of everyday living will be addressed. This course will aid in developing patient/customer service skills through team participation and communication in respect to professional/ personal encounters affecting work values, ethics and leadership skills. Prerequisite: Third-term status in program.

EC: ECONOMICS

EC 115 Outline of Economics
l (4 class hrs/wk, 4 cr) F/Sp/Su
Provides an overview of micro- and macroeconomics. The U.S. economic system is discussed from both national and individual perspectives. Discusses topics such as supply and demand, national accounting, monetary policy, fiscal policy, productivity, market models, income, wealth and taxation.

EC 201 Introduction to Microeconomics
■ *(4 class hrs/wk, 4 cr) F/W/Sp/Su*
Introduces the theory of relative prices in a market system, consumer choice, marginal analysis, and the allocation of productive resources among alternative uses in a market economy. Other topics may include market power and price discrimination, public finance, the labor market and environmental policy. Prerequisite: MTH 111 College Algebra.

EC 202 Introduction to Macroeconomics
■ *(4 class hrs/wk, 4 cr) W/Sp/Su*
Introduces the determination of levels of national income, employment and prices, and the basic causes of fluctuations in the business cycle, the banking system, monetary policy and financial intermediation. Other topics may include international trade and international finance. Prerequisite: MTH 111 College Algebra.

EC 215 Economic Development of the U.S.
■ *(4 class hrs/wk, 4 cr) F/Sp*
Provides historical study and understanding of the sources of economic growth and change in the United States. Discussions about how changes in industry, agriculture, commerce, transportation, labor, and finance have affected the speed of change of American lifestyles and the increased economic well-being of society.

EC 220 Contemporary U.S. Economic Issues: Discrimination
■ *(3 class hrs/wk, 3 cr) W/Sp*
Focuses on discrimination in the U.S. and its impact within our market economy. Primary focus is inequities for women and minorities in the labor market.

ED: EDUCATION

ED 101 Observation and Guidance
(7 class hrs/wk, 3 cr) F/W
An introductory practicum experience focusing on methods of interacting with young children in classroom or child care settings. Students work with children individually and in small groups.

ED 101A Observation and Guidance
(7 class hrs/wk, 3 cr) W
Students observe children and teachers in an elementary or secondary classroom setting and assist the teacher as appropriate. Students spend six hours each week in the classroom and one hour each week in seminar. Appropriate for students with limited prior experience with children or in a structured teaching setting. Must be arranged one term in advance. Recommended: ED 216 Purpose, Structure and Function of Education in a Democracy, or HDFS 233 Professional Foundations in Early Childhood, or HDFS 225 Child Development.

ED 102 Education Practicum
(7 class hrs/wk, 3 cr) F/W/Sp
Students gain experience by working with young children in an educational setting. Students increase their knowledge of child development and learning environments, begin planning and implementing curricula, and develop skills in guidance and discipline. Prerequisite: ED 101 Observation and Guidance. Recommended: ED 7.730 Early Childhood Ages and Stages or HDFS 225 Child Development or HDFS 248 Learning Experiences for Children or ED 152 Creative Activities/Dramatic Play or ED 179 Literature, Science and Math.

ED 102A Education Practicum
(7 class hrs/wk, 3 cr) W/Sp
Students assist the teacher in providing learning activities for children in an elementary or secondary classroom. In cooperation with teachers, students develop and deliver at least one lesson during the quarter. Students spend six hours each week in the classroom and one hour each week in seminar. Must be arranged one term in advance. Prerequisite: Experience working with children in a structured setting. Recommended: ED 216 Purpose, Structure and Function of Education in a Democracy, or HDFS 233 Professional Foundations in Early Childhood, or HDFS 225 Child Development.

ED 103 Extended Education Practicum
(7 class hrs/wk, 3 cr) F/W/Sp
Field experience in a classroom or child care setting with young children. Students apply in-depth knowledge, methods and skills gained from education courses. Includes one full-day teaching experience. Prerequisite: ED 102 Education Practicum. Recommended: HDFS 225 Child Development, ED 7.710 Principles of Observation; HDFS 248 Learning Experiences for Children or ED 152 Creative Activities/Dramatic Play or ED 179 Literature, Science and Math or ED 7.730 Early Childhood Ages and Stages.

ED 104 Advanced Practicum
(34 class hrs/wk, 12 cr) As needed
Pre-professional internship in a toddler, preschool or kindergarten classroom setting that closely resembles the duties of a teacher on a team. Provides comprehensive application of coursework in the program. Includes full-day work throughout the week and curriculum planning and implementation. Prerequisites: ED 103 Extended Education Practicum and HDFS 225 Child Development and ED 7.710 Principles of Observation; HDFS 248 Learning Experiences for Children or ED 152 Creative Activities/Dramatic Play or ED 179 Literature, Science and Math.

ED 123 Reading Instruction
(4 class hrs/wk, 4 cr) W Alternate years
Introduces the essential skills needed to read and the primary approaches to teaching reading. Presents a systematic approach to teaching reading with instruction in informal assessment, readiness indicators, vocabulary skills, and comprehension, as well as motivation to learn to read. Students learn techniques for implementing reading lessons, practice assessment techniques, and research a reading instruction topic of their choice. Also, students examine current area reading adoptions and learn benchmarks for reading performance.

ED 124 Mathematics and Science Instruction
(4 class hrs/wk, 4 cr) Sp Alternate years
Course focuses on mathematics and science for instructional assistants. Covers a variety of instructional techniques that can be used with individual students or groups, how to cope with a variety of learning styles and special needs students, the prevention of accidents, injuries and illness at the worksite/in the classroom, and the use of technology in the classroom. Learning will include the Oregon Mathematics Teaching and Learning Standards, Benchmarks, and Essential Learning Skills for grades 3, 5 and 8, Scoring Guides for Mathematics Problem Solving, and student portfolios. Students examine currently adopted math programs. There is an emphasis on becoming more comfortable with mathematics and science throughout the entire course. Prerequisite: MTH 060 Introduction to Algebra.

ED 152 Creative Activities/Dramatic Play
(3 class hrs/wk, 3 cr) W
Focuses on understanding and implementing a developmental approach to creative activities for young children. Involves hands-on experience with a wide variety of activities and mediums. Emphasizes art, music and movement, and dramatics, and creative play. Includes methods of presentation and evaluation.

ED 179 Literature, Science and Math
(3 class hrs/wk, 3 cr) Sp
Focuses on understanding and creating quality curricula for young children. Hands-on experience with a wide variety of activities in literature, science and math. Includes planning, implementing, and evaluating materials and learning experiences for young children.

ED 207 Beginning Leadership
(3 class hrs/wk, 3 cr) F/W
Overviews leadership theory, styles and skills. Provides skill-building exercises, professional networking techniques, group process and teamwork methods, basic communication techniques, prioritizing, goal setting and other basic information necessary for those anticipating leadership roles.

ED 216 Purpose, Structure and Function of Education in a Democracy
(3 class hrs/wk, 3 cr) F/W/Sp
Examines the system of education in a democratic society - past, present, and future. Historical, social, philosophical, political, legal and economic foundations of education in Oregon, the USA, and other countries provides a framework for analyzing contemporary educational issues in schools, communities, and workplaces.

ED 219 Multicultural Issues in Educational Settings
(3 class hrs/wk, 3 cr) F/W/Sp
Examination of the context of working with schools, communities and workplaces. Students will consider the diversity of learners, and learning cultures (e.g. urban, suburban, rural). The diversity among learners within those different cultures, and the influence of culture on one's learning will also be explored.

ED 252 Behavior Management
(3 class hrs/wk, 3 cr) W
Presents the principles of behavior management in order to maximize instructional potential. Attention is given to individual differences, developmental issues, learning and personality styles, and to positive communication techniques designed to develop prosocial competence.

ED 280 CWE: Education
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
Structured field experience in a teaching and learning setting. Working with a master teacher, students learn current educational strategies and techniques. Students identify job performance objectives, work a specified number of hours during the term and attend a related CWE seminar. Credits are based on identified objectives and number of hours worked. This is a supervised work experience that must be approved by the CWE coordinator prior to enrolling in the class.

ED 280S Service Learning Education
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
An instructional program, using contextual learning, designed to promote critical thinking, citizenship and civic responsibility as students work with community partners in addressing real community needs. Students identify learning objectives, work a specified number of hours during the term, and engage in faculty-led guided reflection activities. Prerequisites: Students must have taken or must be currently taking appropriate course or courses in their major field of study. They must also have their service learning approved by the appropriate faculty coordinator.

ED 282 Working with Children with Special Needs
(3 class hrs/wk, 3 cr) F
Overview of special education legislation and the role of family, school and community in educating and supporting individuals with disabilities. Class is tailored to meet the needs of students who enroll, with a focus on in-school special needs issues or community agency issues. Implementation of current legislation and its impact in the classroom are addressed.

ED 7.710 Principles of Observation
(3 class hrs/wk, 3 cr) W
Observe children, teachers and classroom environment using a variety of techniques. Focuses on methods of interacting with young children in a classroom setting.

ED 7.723 Supporting Young Children's Social Emotional Development
(3 class hrs/wk, 3 cr)
Focuses on promoting the social emotional development of young children in group settings as a means of preventing challenging behaviors. The course uses the Positive Behavior Support (PBS) framework to address building positive relationships, creating supportive environments, developing teaching strategies, and individualizing interventions to address challenging behaviors by meeting children's unique needs.

ED 7.725 Job Search Skills
(1 class hr/wk, 1 cr) Sp
Learn how to organize and conduct a search for work in the field of education. Develop your résumé, prepare for interviews, and go through the job application process.

ED 7.730 Early Childhood Ages and Stages
(3 class hrs/wk, 3 cr) F
Focuses on understanding normative stages of children's development (ages 0–8 years) and introduces child development research and terminology. Application of concepts to daily interactions with young children.

ED 7.731 Positive Guidance for Young Children
(3 class hrs/wk, 3 cr) Alternate years
Focuses on understanding and guiding behavior of young children (ages 0–8 years) in child care settings. Students look at the research supporting guidance practices, develop criteria for selection of strategies, evaluate popular guidance techniques and develop a toolbox of strategies that promote the healthy development of young children.

ED 7.732 Health, Safety and Nutrition in Early Childhood
(3 class hrs/wk, 3 cr) As needed
Focuses on the health, safety and nutritional needs of young children. Attention is given to a variety of topics with an emphasis on maintaining healthy and safe indoor and outdoor environments, providing nutrition education, understanding common diseases, and recognizing and reporting child abuse and neglect.

ED 7.733 Early Literacy: Speaking and Listening
(3 class hrs/wk, 3 cr) W
Builds on the foundation of ED 7.753 and focuses in the area of oral language. Students will become familiar with stages of development and strategies to enhance vocabulary, phonological awareness, storytelling, shared reading and working with families. Recommended: ED 7.753 Foundations of Literacy.

ED 7.734 Early Literacy: Reading and Writing
(3 class hrs/wk, 3 cr) Sp
Builds on the foundation of ED 7.753 and focuses in greater depth in the areas of emergent reading and writing. Students will become familiar with stages of development and strategies to enhance alphabet knowledge, word recognition, comprehension, and links between oral language and print. Recommended: ED 7.753 Foundations of Literacy.

ED 7.740 Introduction to School Libraries
(5 class hrs/wk, 3 cr) F Alternate years
Presents an overview of school librarianship within the context of the educational mission of the school. Includes the role of the library assistant, basic library terminology, procedures and services, and library materials.

ED 7.741 Circulation of Library Materials
(5 class hrs/wk, 3 cr) F Alternate years
Principles and practices of library circulation, print and electronic circulation systems, shelving, overdues, and interlibrary loan issues.

ED 7.742 Reference Materials and Services
(5 class hrs/wk, 3 cr) Sp Alternate years
Introduction to using print and electronic reference materials and providing information services to students. Includes information literacy skills, and working with teacher and student assignments.

ED 7.743 Collection Development
(5 class hrs/wk, 3 cr) W Alternate years
Presents an overview of the principles and practices of building and maintaining the library collection, including identifying the needs of the users and the elements and importance of a collection development policy in managing the collection. Students develop tools for dealing with library collection management issues.

ED 7.744 Organization of Library Materials
(5 class hrs/wk, 3 cr) Sp Alternate years
Introduction to classification and cataloging practices including the Dewey Decimal System, subject headings, filing rules, MARC records, and print and electronic systems.

ED 7.745 Online Information Literacy for Librarians
(5 class hrs/wk, 3 cr) F Alternate years
An introduction to using electronic resources in searching for information. Includes information literacy approaches to locating information for students and library patrons. Some library and computer experience helpful.

ED 7.746 Children's Literature and Reading Promotion
(5 class hrs/wk, 3 cr) W Alternate years
An overview of literature for use with elementary, middle, and high school students. Includes fiction and nonfiction in a variety of genre, reading levels and interests, techniques for sharing literature with students.

ED 7.747 Multicultural Literature K–12
(5 class hrs/wk, 3 cr) F Alternate years
An introduction to children's and young adult literature that respectfully depicts the range of cultures in the United States. Includes the selection, evaluation, and promotion of multicultural literature in library and classroom.

ED 7.748 Library Skill Curriculum
(5 class hrs/wk, 3 cr) W Alternate years
An overview of the educational mission of K–12 instruction, library skills instruction and strategies to support classroom educational activities. Prior library or classroom experience helpful.

ED 7.749 Global Literature K–12
(5 class hrs/wk, 3 cr) W Alternate years
An introduction to children's and young adult literature, fiction and nonfiction, set in countries around the world. Both contemporary and historical literature for use at the elementary and secondary school levels.

ED 7.751 Reading Promotion/Readers Advisory
(5 class hrs/wk, 3 cr) Sp Alternate years
An overview of approaches, activities and techniques for providing readers advisory services and promoting reading in school and public libraries.

ED 7.752 Design and Production of Library Resources
(5 class hrs/wk, 3 cr) Sp Alternate years
An overview of the design of the library and the use of library materials to respond to patron needs and interests. Includes the use of library space, signage, and visual communication of resources. Covers the creation and maintenance of print and electronic library and instructional materials.

Non-Certificate/Non-Degree Courses Offered by the Family Connections Department

9.930 Professional Issues in Child and Family Studies
(1 class hr /wk, 1 cr)
Includes legal and ethical issues in working with children and families, e.g. health and safety standards, licensing, adult:child ratios and child abuse reporting. Emphasizes being family focused. Includes professional organizations, advocacy training and accreditation preparation.

9.931 Health, Safety, Nutrition
(1 class hr/wk, 0 cr)
Provides basic information on health, safety issues and nutrition. Designed for practicing child care providers.

9.932 Child Development
(1 class hr/wk, 1 cr)
Information on child development for practicing child care providers. Focuses on the development of children ages birth through 13 years and the implications for practice in a child care setting.

9.934 Organization and Administration
(1 class hr/wk, 1 cr)
Information on enhancing child care as a business. Develop skills in professional planning, marketing, tax reporting, contracts and basic record keeping.

9.936 Curriculum Development
(1 class hr/wk, 1 cr)
Child care providers learn components of high-quality programming for children. Enhances the provider's ability to plan appropriate activities, equip the environment and obtain resources to meet the needs of children birth to 13 years.

9.938 Infant and Toddler Care
(1–3 class hrs/wk, 1–3 cr)
Family and center providers learn the elements of quality care for infants and toddlers. Emphasizes all areas of development: physical, social, emotional, cognitive and language. Includes group-care techniques, family/provider relationships and cultural diversity.

9.939 School Age Care
(1 class hr/wk, 1 cr)
Overview of care and education for those caring for school-age children. Focuses on child and adolescent development, curriculum design, business practices, marketing and staff development.

ED 7.753 Foundations of Literacy
(3 class hrs/wk, 3 cr) F
This class focuses on exploring the foundations of literacy: listening, speaking, reading and writing. Students will become familiar with emerging literacy in young children, strategies and curriculum for developing literacy skills.

EG: ENGINEERING GRAPHICS

EG 4.407 Introduction to CAD
(6 class hrs/wk, 4 cr) F/Sp
A course for drafters, technicians and engineers in the application and functions of computer-aided drafting. Emphasizes hands-on operation of CAD systems. Prerequisites: Working knowledge of Windows, drafting experience and instructor's approval.

EG 4.409 Drafting I
(3 class hrs/wk, 2 cr) F
Presents fundamentals of technical drawing. Emphasizes line language, geometric construction, sketching and layout procedures and multiview drawings.

EG 4.411 CAD I
(6 class hrs/wk, 4 cr) F
An introduction to the application and functions of computer aided drafting. Emphasizes hands-on operation of CAD systems. Prerequisite: MTH 065 Elementary Algebra. Corequisite: CIS 125 Introduction to Software Applications or demonstrated working knowledge through competency test.

EG 4.416 Intermediate CAD
(6 class hrs/wk, 4 cr) W
Teaches experienced AutoCAD users productivity enhancing tools and methodology to produce and edit drawings to ANSI standards using advanced commands. Includes advanced AutoCAD concepts and configuration. Prerequisite: EG 4.407 Introduction to CAD or instructor's approval.

EG 4.421 CAD II
(6 class hrs/wk, 4 cr) W
Covers methods of technical drawing utilizing ANSI standards to produce two-dimensional technical drawings. Introduces more advanced techniques in drafting using AutoCAD's drawing and editing commands. Prerequisites: EG 4.411 CAD I and EG 4.409 Drafting I or instructor's approval.

EG 4.423 Architectural Design I
(6 class hrs/wk, 4 cr) W
Introduces basic architectural drafting techniques and methods. Covers the fundamental concepts of residential building design with identification and use of professional architectural standards used in residential building drawings. Includes architectural symbols and construction methods used in residential and light commercial buildings. Prerequisites: EG 4.411 CAD I or instructor's approval.

EG 4.431 CAD III
(6 class hrs/wk, 4 cr) Sp
Basic through advanced 3-D solids modeling using AutoCAD. Mechanical parts, assemblies, presentations and drawings to ANSI standards. Prerequisite: EG 4.421 CAD II or instructor's approval.

EG 4.443 Schematics
(6 class hrs/wk, 4 cr) F
Covers methods for drawing electrical, mechanical and plumbing schematic diagrams and pictorial layouts. Includes logic diagrams, electronic component layout, printed circuit boards, schematics. Piping, plumbing and HVAC standards and practices also are studied. Prerequisite: EG 4.421 CAD II or instructor's approval.

EG 4.445 Plane Surveying
(4 class hrs/wk, 3 cr) Sp
A basic course in surveying. Includes distance measuring, leveling, cross sectioning, traversing, topographic surveying, use of survey instruments, and office procedures. Prerequisites: MTH 097 Practical Geometry; EG 4.421 CAD II.

EG 4.446 Strength of Materials
(3 class hrs/wk, 3 cr) Sp
An introduction to engineering mechanics, including force, force vectors, moments, resultants, centroids, moments of inertia, bending stress, shear and torsion. Prerequisite: MTH 065 Elementary Algebra.

EG 4.451 Solids I
(6 class hrs/wk, 4 cr) F
This class explores basic parametric solid modeling, engineering design and rapid prototyping. Students will create solids, assemblies, and dimensioned drawings from the solids. Extrusions, Boolean operations and feature editing will also be covered. Prerequisite: EG 4.431 CAD III.

EG 4.452 Solids II
(4 class hrs/wk, 3 cr) W
Explores advanced parametric solid modeling, collaborative engineering design and rapid prototyping. Students gain practical, hands-on experience in design and production using the most advanced tools and technologies available today. Students create animation for client presentation as well as use stress analysis tools to refine design. Prerequisite: EG 4.451 Solids I.

EG 4.453 Customizing CAD Systems
(4 class hrs/wk, 3 cr) W
Customize the user interface of current CAD system focusing on increased productivity regardless of discipline. Includes keyboard and menu customization, editing toolbars, macros and programming. Prerequisite: EG 4.431 CAD III or instructor's approval.

EG 4.454 Applied Solids Design
(4 class hrs/wk, 3 cr) Sp
Capstone class designed to challenge students with a team design project that is manufactured and tested, simulating a real world application of knowledge and skills. Prerequisites: EG 4.451 Solids I and EG 4.452 Solids II.

EG 4.455 Structural Drafting
(3 class hrs/wk, 2 cr) W
Introduces structural drafting. Emphasizes framing plans, connections, fabrication details, foundation drawings, and other drawings required for structural steel, precast concrete, and poured-in-place concrete drawings. Prerequisites: EG 4.411 CAD I and EG 4.409 Drafting I.

EG 4.456 Civil Drafting Lab
(2 class hrs/wk, 1 cr) Sp
A lab course covering basic civil drafting techniques. Designed for students concurrently enrolled in CEM 263 Plane Surveying who wish to include a civil drafting component in the surveying course. Includes drafting survey maps, plats, plan and profile, and topo maps. Prerequisite: EG 4.421 CAD II.

EG 4.457 Workplace Survey
(3 class hrs/wk, 1 cr) Sp
Introduction to actual workplace environments. Students experience workplace environments and end use of drawing efforts.

EG 4.463 Architectural Design II
(6 class hrs/wk, 4 cr) Sp
Covers intermediate residential design principles including design of floor plans, elevations, 3-D presentation and working drawings using advanced 3-D architectural software. Prerequisite: EG 4.423 Architectural Design I.

EG 4.465 Civil Drafting II
(6 class hrs/wk, 3 cr) W
Covers advanced topics in surveying and civil engineering drafting/design. Includes an introduction to Land Development Desktop. Prerequisites: Basic AutoCAD proficiency (EG 4.411 CAD I or equivalent) and Surveying (CEM 263 Plane Surveying or equivalent) and EG 4.456 Civil Drafting Lab.

EG 4.467 Technical Project
(2–6 class hrs/wk, 1–3 cr) F/W/Sp
Advanced study in an area of student interest in the drafting trades. Develops skills in gathering, sorting and finding solutions to real life problems and procedures used in drafting.

EG 4.475 3-D Parametric Modeling
(2 class hrs/wk, 2 cr) F
Covers mechanical design considerations for producing technical drawings for manufactured parts. Students learn Boolean operations in conjunction with parametric solids modeling in the creation of composite solid models. CIM data exchange files and formats are explored. Prerequisites: MTH 111 College Algebra or instructor's approval.

ENG: ENGLISH

ENG 104 Literature: Fiction
➢*(3 class hrs/wk, 3 cr) F/W/Sp*
Examines fiction through selected literary works, such as the short story and the novel, and increases understanding of the conventions of fiction. Encourages exploration of the human experience through the reading of significant short stories and novels, with an emphasis on analysis, interpretation, and the fiction-writer's craft. Note: Need not be taken in sequence. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 106 Literature: Poetry
➢*(3 class hrs/wk, 3 cr) F/W/Sp*
Studies poetry drawn from American, English and world literature, enhances understanding of the conventions of poetry and poetic forms, and encourages exploration of the human experience. Works are read in entirety when possible, with emphasis on elements such as form, style, imagery, figurative language and musical devices. Note: Need not be taken in sequence. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 107 Western World Literature: Classical
➢*(4 class hrs/wk, 4 cr) F Alternate years*
Surveys the literature of three cultures of the ancient western world from 3000 BC to 100 AD. Students explore the themes, stories and ideas that concern our literary ancestors, in particular the Greeks, Romans and Hebrews. Note: Need not be taken in sequence. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 109 Western World Literature: Modern
➢*(4 class hrs/wk, 4 cr) W Alternate years*
Surveys European literature from the Romantic, Realist, Naturalist, and Modernistic periods. Note: Need not be taken in sequence. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 110 Film Studies
➢*(3 class hrs/wk, 3 cr) F/W/Sp*
Explores the power of film to shape and reflect culture and ideology; raises questions about film and its relationship to self, others, and social values. Studies film genres and styles; aesthetics; film history; film as a collaborative medium; Hollywood, independent and international cinema; techniques and grammar of film; and major film theories. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 201 Shakespeare
➢*(4 class hrs/wk, 4 cr) F Alternate years*
Studies major plays of Shakespeare, including the structure, characterization, setting and imagery employed in selected comedies, tragedies, histories and poems. Note: Need not be taken in sequence. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 202 Shakespeare
➢*(4 class hrs/wk, 4 cr) W Alternate years*
Studies major plays of Shakespeare, including the structure, characterization, setting and imagery employed in selected comedies, tragedies, histories and poems. Note: Need not be taken in sequence. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 204 English Literature: Early
➢(3 class hrs/wk, 3 cr) F Alternate years
Studies representative works in English literature for their inherent worth and for their reflection of the times in which they were written. Note: ENG 204, ENG 205 and ENG 206 need not be taken in sequence. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 205 English Literature: Middle
➢(3 class hrs/wk, 3 cr) W Alternate years
Studies representative works in English literature for their inherent worth and for their reflection of the times in which they were written. Note: ENG 204, ENG 205 and ENG 206 need not be taken in sequence. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 206 English Literature: Modern
➢(3 class hrs/wk, 3 cr) Sp Alternate years
Studies representative works in English literature for their inherent worth and for their reflection of the times in which they were written. Note: ENG 204, ENG 205 and ENG 206 need not be taken in sequence. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 207 Non-Western World Literature: Asia
➢(3 class hrs/wk, 3 cr) F Alternate years
Surveys ancient and modern literature from India, China and Japan. Note: Need not be taken in sequence. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 208 Non-Western World Literature: Africa
➢(3 class hrs/wk, 3 cr) W Alternate years
Explores literary works of African writers from tribal, colonial and post-colonial eras. Note: Need not be taken in sequence. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 209 Non-Western World Literature: The Americas
➢(3 class hrs/wk, 3 cr) Sp Alternate years
Surveys American literature, analyzing works by writers from North, Central, and South America and the Caribbean, from prior to the European Contact through the modern period. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 215 Latino/a Literature
➢(3 class hrs/wk 3 cr) As needed
Examines the evolution of Latino/a literature in the United States beginning in the mid 16th century, including the original between European and pre-Columbian societies. The class explores thematic issues that have influenced and shaped the literature of Latino minorities, as well as students' own perceptions of Latin culture. Readings may include works of history, memoirs, letters and essays, as well as fiction, poetry and drama by U.S. born Latino/Chicano authors such as Richard Rodriqueg, Sandra Cisneros and Luis Valdez. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 220 Literature of American Minorities
➢(3 class hrs/wk 3 cr) F/W/Sp
Features a selection of works by writers from ethnic minority cultures within the United States. The works of these cultures generally have not been well-represented in traditional literature courses, and the views from these cultures often are in contrast to the more familiar representations of mainstream literature. These works reflect historical and cultural examples of discrimination and difference across the society. This course will explore how humans have dealt with this discrimination and how these cultures enrich the patterns of the American experience despite their experiences as minorities. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 221 Children's Literature
➢(3 class hrs/wk, 3 cr) F/W/Sp
This class is designed for all students who have an interest in children's literature and for education majors who are or will be working with children. The course covers the history and various genres of children's literature and focuses on defining, valuing, and evaluating. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 253 American Literature: Early
➢(4 class hrs/wk, 4 cr) F Alternate years
Focuses on the literary works of America through Native American stories, the African American vernacular (songs and tales), European exploration writings, the writings of Colonial America (1620–1776) and the literature of the New Republic (1776–1836). Emphasis on the historical, social, and philosophical backgrounds. ENG 253 provides an understanding of and appreciation for American culture as expressed in literature. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 255 American Literature: Modern
➢(4 class hrs/wk, 4 cr) W Alternate years
Focuses on a century of fiction, poetry, drama, and essays (The Literature of a New Century: 1912–1946 and The Literature Since Mid-Century, 1945 – Present). Questions how "American literature" has been defined and how those definitions have been challenged and changed over the last century. Emphasis on long recognized "major" authors as well as "minor" ones. Exploration of the literature in relation to literary and historical movements as well as on its own merit. ENG 255 provides an understanding of and appreciation for American culture as expressed in literature. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 257 African-American Literature
➢(3 class hrs/wk, 3 cr) Sp As needed
Focuses on African-American culture and tradition (social, political, historical) through an exploration of the literature by African-Americans. Studies works by African-American writers on their own terms, understanding the genres they created, the subjects they expressed, and their indelible voices in the American grain. This emphasis on African American voices, on their own terms, enriches understanding not only of these primary American authors, but also enriches our understanding of the rich cultural diversity of American literature. Prerequisite: WR 121 skill level suggested.

ENG 261 Science Fiction
➢(3 class hrs/wk, 3 cr) As needed
Explores science fiction, fantasy and speculative futures through popular fiction. Discusses content, styles, techniques and conventions of the genre. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course.

ENG 280S Service-Learning English/Writing
(3-42 class hrs/wk, 1-14 cr) F/W/Sp/Su
An instructional program, using contextual learning, designed to promote critical thinking, citizenship and civic responsibility as students work with community partners in addressing real community needs. Students identify learning objectives, work a specified number of hours during the term, and engage in faculty-led guided reflection activities. Prerequisites: Students must have taken or must be currently taking appropriate course or courses in their major field of study. They must also have their service-learning approved by the appropriate faculty coordinator.

ENGR: ENGINEERING

ENGR 111 Engineering Orientation I
(4 class hrs/wk, 4 cr) F/W
Covers engineering as a profession, historical development, ethics, curricula and engineering careers. Introduces design, problem analysis and solution, and the general skills necessary for success in the Engineering program.

ENGR 112 Engineering Orientation II
(6 class hrs/wk, 4 cr) W/Sp
Covers systematic approaches to problem solving using the computer. Includes logic analysis, flow charting, input/output design, introductory computer programming, and the use of engineering software. Prerequisite: Math 111 College Algebra.

ENGR 201 Electrical Fundamentals: DC Circuits
(6 class hrs/wk, 4 cr) F
Covers fundamentals of circuit analysis, including node and mesh analysis, superposition, and Thevenin and Norton's Theorem. Introduces op-amps, capacitors and inductors. Prerequisite: MTH 251 Differential Calculus.

ENGR 202 Electrical Fundamentals: AC Circuits
(6 class hrs/wk, 4 cr) W
Covers AC circuit analysis techniques; covers sinusoidal steady state and analysis of three-phase circuits; introduces mutual inductance and transformers; looks at resonant circuit; investigate filters and continue to look at op-amp circuits. Prerequisites: MTH 252 Integral Calculus; ENGR 201 Electrical Fundamentals.

ENGR 203 Electrical Fundamentals: Signals and Controls
(6 class hrs/wk, 4 cr) Sp
Covers transient circuit analysis-RL, RC, RLC. Introduces LaPlace Transform and its use in circuit analysis, the transfer function, Bode diagram and two port networks. Prerequisites: MTH 253 Calculus; ENGR 202 Electrical Fundamentals.

ENGR 211 Statics
(5 class hrs/wk, 4 cr) F
Includes an analysis of 2D and 3D force systems, moments, resultants, equilibrium, trusses, frames and machines, centroids, moment and product of inertia, shear and moment in beams, and friction. Prerequisites: Working knowledge of spreadsheets, MTH 252 Integral Calculus.

ENGR 212 Dynamics
(5 class hrs/wk, 4 cr) W
Includes particle and rigid body kinematics and kinetics, Newton's laws, work energy and impulse momentum. Prerequisites: ENGR 211 Statics; MTH 252 Integral Calculus; PH 211 General Physics with Calculus or PH 201 General Physics; and a working knowledge of spreadsheets.

ENGR 213 Strength of Materials
(5 class hrs/wk, 4 cr) Sp
Includes simple stress and strain, biaxial stress and strain, pressure vessels, torsion, shear and moment, shear and normal stresses in beams, deflection, column analysis, and analysis of statically indeterminate structures. Prerequisites: ENGR 211 Statics, MTH 252 Integral Calculus, and a working knowledge of spreadsheets.

ENGR 242 Introduction to GIS
(3 class hrs/wk, 3 cr)
An introductory course in geographic Information systems (GIS). Uses Arc GIS software to display and work with spatial data, work with attributes, query databases, and present data. Prerequisite: Knowledge of computer and Windows operation.

ENGR 245 Engineering Graphics: Civil
(4 class hrs/wk, 3 cr) Sp
Includes two-dimensional and three-dimensional graphics, sketching, multiview projection, dimensioning, descriptive geometry, engineering design and an introduction to AutoCad®. Prerequisite: Working knowledge of Windows and MTH 111 College Algebra.

ENGR 248 Engineering Graphics: Mechanical
(4 class hrs/wk, 3 cr)
Includes two-dimensional and three-dimensional graphics, sketching, multiview projection, dimensioning, descriptive geometry, and an Introduction to computer based solid modeling.

ENGR 271 Digital Logic Design
(4 class hrs/wk, 3 cr) Sp
Provides an introduction to digital logic and state machine design. Covers logic design, including logic gates, gate minimization methods and design with standard medium scale integration (MSI) logic circuits. Includes basic memory elements (flip-flops) and their use in simple-state machines. Prerequisites: MTH 231 Elements of Discrete Mathematics or MTH 251 Differential Calculus.

ENGR 272 Digital Logic Design Lab
(2 class hrs/wk, 1 cr) Sp
A lab to accompany ENGR 271 Digital Logic Design. Illustrates the topics covered in ENGR 271 using computer-aided design, verification tools and prototyping hardware. Prerequisite: ENGR 112 Engineering Orientation II or ENGR 201 Electrical Fundamentals: DC Circuits. Corequisite: ENGR 271 Digital Logic Design.

ENL: ENGLISH FOR NON-NATIVE LEARNERS

ENL 050 Survey of Basic Writing Skills for ELLs
(3 class hrs/wk, 3 cr)
Designed for students who speak another language in addition to English and want to improve their basic academic writing skills with specific ESOL support. ENL 050W is appropriate for ESOL students who have high-level listening/speaking skills and basic writing skills. Students may be preparing for success in academic writing classes such as WR 090 The Write Course or the GED Writing Test. ENL 050W includes instruction in grammar for non-native speakers of English, for example, article usage, word order, and verb tense/aspect as well as sentence construction, punctuation, some reading, and informal and formal writing practice. The course also include basic instruction in using a computer to create documents. Prerequisite: Appropriate score on the writing portion of the College Placement Test (CPT) or referral from ESOL faculty.

ENL 065G Fundamental ESOL Grammar for Academics
(3 class hrs/wk, 3 cr)
Designed for English language learners. Students increase their ability to recognize and use correct grammar in speaking and writing. Students focus on the form, function, and meaning of English language structures. Prerequisite: Intermediate English proficiency, ESOL Level B, or higher. Also recommended: CPT placement into WR 090 The Write Course.

ENL 070V College Vocabulary for ELLs
(3 class hrs/wk, 3 cr)
Designed for English language learners. Through thematic readings and focused vocabulary exercises, non-native speakers of English learn college vocabulary from the Academic Word List that is common to all areas of academic study. Students learn strategies to use when encountering new words in reading and strategies for building their vocabulary. Prerequisite: Intermediate to advanced English proficiency. Also recommended: ENL 080R or higher, co-registered in any ENL class, or co-registered in ESOL Level B or C.

ENL 075G Intermediate ESOL Grammar for Academics
(3 class hrs/wk, 3 cr)
Designed for English language learners. Students learn and use grammar structures needed for success in academic courses through focused and communicative exercises while speaking and writing about academic and contemporary topics. Prerequisite: Successful completion of ENL 065G Fundamental ESOL Grammar for Academics or demonstrated proficiency at a high intermediate/low advanced (high ESOL Level B) level. Also recommended: CPT placement into RD 090 College Success & Reading Strategies or WR 095 College Writing Fundamentals.

ENL 075P English Pronunciation
(3 class hrs/wk, 3 cr)
Designed for English language learners. Introduces learners to basic principles of American English pronunciation. Focuses on word and syllable stress, thought groups, focus words, linking, speech rhythm, intonation, and problematic phonemes of American English. Prerequisite: ESOL Level B, intermediate English language proficiency, or higher.

ENL 080R Developing Reading Skills for ELLs
(3 class hrs/wk, 3 cr)
Designed for non-native speakers of English who want to be able to read more fluently in English with greater understanding. Provides development of vocabulary and learning a variety of active reading strategies in order to recognize main ideas, find evidence to support claims, and make connections to the text.

ENL 085G Advanced ESOL Grammar for Academics
(3 class hrs/wk, 3 cr)
Designed for non-native speakers of English. Focuses on increasing fluency and accuracy in using English grammatical forms at the advanced level in speaking and writing for academic purposes. Prerequisite: Successful completion of ENL 075G Intermediate ESOL Grammar for Academics, Advanced English language proficiency, ESOL Level C, or CPT placement into WR 115 Introduction to College Writing.

ENL 085S Introduction to College Lectures and Note-taking
(3 class hrs/wk, 3 cr)
Designed for English language learners. Students learn note-taking and listening skills in an academic environment in order to increase understanding of college lectures, presentations, videos, and class discussions. Prerequisite: ESOL high Level B, high intermediate English language proficiency, or higher.

ENL 090C Presentations and Pronunciation
(3 class hrs/wk, 3 cr)
Designed for English language learners. Students develop speaking and presentation skills needed in academic and professional settings. Pronunciation practice focuses on syllable stress, reductions, linking, rhythm, and intonation, as well as specific needs of individual students. Prerequisite: ESOL Level B, intermediate English language proficiency, or higher.

ENL 090R Strategies for Effective Reading for ELLs
(3 class hrs/wk, 3 cr)
Designed for English language learners. Focuses on increasing vocabulary and using more complex reading strategies to become more effective, active readers in the academic environment. Students interact with introductory college-level texts as well as increasingly difficult texts for English language learners. Prerequisite: Successful completion of ENL 080R Developing Reading Skills for ELLs with a "C" or better, CPT placement into RD 090 College Success & Reading Strategies, or ESOL Level C with ESOL faculty recommendation.

ENL 090W The Write Course for ELLs
(3 class hrs/wk, 3 cr)
Designed for English language learners. Introduces learners to the writing process and academic writing in English. Focuses on writing effective sentences, basic paragraph writing, and reviewing English grammar. Prerequisite: Pre-enrollment testing (CPT) into WR 090 The Write Course and a writing sample at an appropriate level.

ENL 095T iBT TOEFL Preparation
(3 class hrs/wk, 3 cr)
Designed for English language learners. Students develop skills and strategies for improving scores on the iBT TOEFL (Test of English as a Foreign Language) while becoming familiar with the test format. Prerequisite: ESOL Level C or low advanced English language proficiency.

ENL 095W College Writing Fundamentals for ELLs
(3 class hrs/wk, 3 cr)
Designed for English language learners. Learners use the writing process and develop their skills in writing short essays. Paraphrasing and summarizing short academic texts help students transition from personal to more academic writing. Students increase their skills in using more complex language structures and standard English. Prerequisite: Successful completion of ENL 090W The Write Course for ELLs or WR 090 The Write Course or appropriate placement on the CPT and a writing sample at an appropriate level. Also recommended: CPT placement into RD 090 College Success & Reading Strategies.

ENL 100S Study Skills for the American Classroom
(3 class hrs/wk. 3 cr)
Designed for English language learners. Introduces students to cultural and practical strategies for success in an American classroom. Focuses on cultural norms, learning styles, instructors' expectations and how to succeed in American academic settings. Designed for ESOL students.

ENL 115R Advanced College Reading for ELLs
(3 class hrs/wk, 3 cr)
Designed for English language learners. Learners develop higher-level academic vocabulary and reading strategies for more effectively reading college-level materials. Students apply critical reading skills to college-level texts including analyzing purpose, perspective, tone, and synthesizing ideas from the readings. Students will gain paraphrasing and summarizing skills. Prerequisite: Successful completion of ENL 090R Strategies for Effective Reading for ELLs or RD 090 College Success & Reading Strategies ("C" or better), CPT placement in RD 115 Advanced College Reading, or ESOL Level C with ESOL faculty recommendation.

ENL 115W Introduction to College Writing for ELLs
(3 class hrs/wk, 3 cr)
Designed for English language learners. Through short essay writing, students continue to develop their academic writing skills, editing skills, and review the conventions of Standard English. Introduces summarizing and responding to college-level texts and writing research papers using outside sources. This course prepares students for WR 121 English Composition and success in other college courses. Prerequisite: Successful completion of ENL 095W College Writing Fundamentals for ELLs or WR 095 College Writing Fundamentals or appropriate placement on the CPT.

ENL 130 Introduction to Medical Terminology 1
(2 class hrs/wk, 2 cr)
Designed for English language learners. This class is an introduction to the basics of medical terminology through word building and pronunciation. Prerequisite: ESOL high Level B, high intermediate English language proficiency, or higher.

ENL 131 Introduction to Medical Terminology 2
(2 class hrs/wk, 2 cr)
Designed for English language learners. This class continues developing word-building skills in medical terminology with a focus on the description of body systems. Prerequisite: ESOL high Level B, high intermediate English language proficiency, or higher.

FW: FISH AND WILDLIFE

FW 251 Principles of Wildlife Conservation
(3 class hrs/wk, 3 cr) F
Introduces the interrelationships between the physical environment and wild animal populations. Examines the history of wildlife conservation and natural resource use, man's relationship to his natural environment, dynamics of animal populations, principles and practices of fisheries and wildlife management, and the role of wildlife biologists. Strongly recommended: MTH 065 Elementary Algebra and college-level reading and writing are strongly recommended for success in this course.

G: GEOLOGY

G 101 Introduction to Geology: The Solid Earth
● *(5 class hrs/wk, 4 cr) F*
Introduces geology and the processes that shape the landscape. Includes a study of rocks and minerals, volcanic activity, plate tectonics, earthquake activity, and earth's geologic resources. Field trips highlight topics discussed. This course includes a laboratory component. Geology courses do not need to be taken in sequence. MTH 065 or equivalent is recommended for success in this course.

G 102 Introduction to Geology: Surface Processes
● *(5 class hrs/wk, 4 cr) W*
Introduces geology and the processes that shape the landscape. Includes a study of mass wasting and landslides, river dynamics and morphology, ground water, glaciers, coastal processes, and an overview of environmental geology and geologic hazards. Field trips highlight topics discussed. This course includes a laboratory component. Geology courses do not need to be taken in sequence. MTH 065 or equivalent is recommended for success in this course.

G 103 Introduction to Geology: Historical Geology
● *(5 class hrs/wk, 4 cr) Sp*
Introduces geology by studying Earth and life as interpreted through the fossil and rock record. Includes fossils, relative and numerical-age dating, stratigraphic principles, global change, and the geologic history of the North American continent. Field trips highlight topics discussed. This course includes a laboratory component. Geology courses do not need to be taken in sequence. MTH 065 or equivalent is recommended for success in this course.

G 201 Physical Geology I
● *(5 class hrs/wk, 4 cr)*
A study of the Earth, fundamental geologic principles, and physical processes acting within and upon the Earth. Topics include Earth's interior, Earth materials, and tectonic processes and their influence on mountains, volcanoes, earthquakes, rocks and minerals. Laboratory component highlights rocks, minerals, and geophysical data. Field trips highlight topics. Geology courses do not need to be taken in sequence. MTH 065 or equivalent is recommended for success in this course.

G 202 Physical Geology II
● *(5 class hrs/wk, 4 cr)*
A study of the Earth, fundamental geologic principles, and physical processes acting within and upon the Earth. Topics focus on surficial processes related to mass wasting, erosion, streams, groundwater, coasts, deserts, glaciers and climate. Laboratory component highlights use of topographic maps and imagery. Field trips highlight topics. Geology courses do not need to be taken in sequence. MTH 065 or equivalent is recommended for success in this course.

G 203 Historical Geology
● *(5 class hrs/wk, 4 cr)*
A study of Earth and fundamental geologic principles as interpreted through the fossil and rock record. Topics include fossils and stratigraphic principles, geologic time and age dating, mountain building, global change, and the geologic history of the North American continent. Laboratory component highlights rocks, fossils, and geologic maps. Field trips highlight topics discussed. Geology courses do not need to be taken in sequence. MTH 065 or equivalent is recommended for success in this course.

GA: GRAPHIC ARTS (APPLIED ARTS)

GA 3.153 Digital Illustration I
(3 class hrs/wk, 3 cr) F
Designed to teach students how to use Illustrator within the Adobe Creative Suite. Basic skills using the illustrator tools will enable students to create illustrations and manipulate them in Illustrator. Projects will be geared toward the various aspects of shapes, paths, points, fills and gradients. Emphasis will also be placed on file management, printing and color management. Student projects, notebooks, reading and exams will be required to complete the class. Corequisites: GA 3.156 Digital Page Layout I, GA 3.157 Digital Image Manipulation I

GA 3.154 Digital Illustration II
(3 class hrs/wk, 3 cr) W
Expands the understanding of vector applications and the understanding of Adobe Illustrator for creation of shapes, paths, points, fill and gradients. Class work includes modifying paths, placing and importing objects, modifying text and manipulation layers. Student projects, a notebook, class discussion, reading and exams will be required to complete the class. Prerequisites: GA 3.153 Digital Illustration I. Corequisites: GA 3.160 Digital Page Layout II, GA 3.161 Digital Image Manipulation II

GA 3.155 Digital Illustration III
(3 class hrs/wk 3 cr) Sp
Students will gain a better understanding of vector illustration software and will learn to smoothly switch between applications depending upon current client needs. Introduces the basic concepts of 3-D illustration using modeling. Discusses career opportunities. Coursework will include preparation of a portfolio. Prerequisites: GA 3.153 Digital Illustration I, GA 3.154 Digital Illustration II. Corequisites: GA 3.168 Digital Page Layout III, GA 3.169 Digital Image Manipulation III

GA 3.156 Digital Page Layout I
(3 class hrs/wk, 3 cr) F
Designed to teach students how to use InDesign For Page Layout. Documents will be produced using Adobe InDesign, students will learn to manipulate digital text and combine the text with other graphic elements. Students will study the traditional and current methods used to prepare layouts for printing. Learning and using the terminology used in the printing and graphics arts industry will be stressed. When producing digital mechanical files, emphasis will be placed on preparing files to the graphic arts industry standards. Student projects, notebooks, reading and exams will be required to complete the class. Corequisites: GA 3.153 Digital Illustration I, GA 3.157 Digital Image Manipulation I

GA 3.157 Digital Image Manipulation I
(3 class hrs/wk, 3 cr) F
Introduces Adobe Photoshop for image manipulation. Students will get an introduction to some of the many tools used in Photoshop. Investigates simple scanning techniques for different image types. There will be course work on manipulation of contrast, color file formats and file size management. Co-requisites: GA 3.153 Digital Illustration I and GA 3.156 Digital Page Layout I

GA 3.160 Digital Page Layout II
(3 class hrs/wk, 3 cr) W
Continued exploration of InDesign as a page layout program. Preparation and preflighting of digital mechanical files will be created to industry standards, as well as font management and the use of Adobe Acrobat for producing PDF's. Prerequisites: GA 3.156. Corequisites: GA 3.154 Digital Illustration II, GA 3.161 Digital Image Manipulation II

GA 3.161 Digital Image Manipulation II
(3 class hrs/wk, 3 cr) W
Advances understanding of Photoshop controls and tools. Using clipping paths, adjustments, effects and layers to create high-end images. Class work includes filters, styles and automation. Prerequisites: GA 3.157 Digital Image Manipulation I. Corequisites: GA 3.154 Digital Illustration II and GA 3.160 Digital Page Layout II

GA 3.162 Web Design II
(3 class hrs/wk, 3 cr) W
Expansion of Web page design using industry standard software for the development of HTML-based Web sites. Explore site definition, page layout, graphic creation, understanding additional Web languages and more advanced implementation of Web sites. Prerequisites: Successful completion of GA 3.190, completion of Digital Imaging Certificate.

GA 3.163 Web Design III
(3 class hrs/wk, 3 cr) Sp
Continued discussion of Web page design using industry standard software for the development of HTML-based Web sites. Explore site definition, page layout, graphic creation, understanding additional Web languages and more advanced implementation of Web sites. Introduction of Wordpress for crafting Web pages. Prerequisite: Successful completion of GA 3.162 Web Design II, completion of Digital Imaging Certificate.

GA 3.168 Digital Page Layout III
(3 class hrs/wk, 3 cr) Sp
This course emphasizes the production of digital mechanical files prepared to industry standards. Course work will place an emphasis on preflighting documents, font management and the use of Adobe Acrobat for producing PDF's. Course objective includes assembly of a portfolio for work searches or entry into the Graphic Arts Program. Corequisites: GA 3.155 Digital Illustration III, GA 3.169 Digital Image Manipulation III

GA 3.169 Digital Image Manipulation III
(3 class hrs/wk, 3 cr) Sp
Culmination of image manipulation sequence. "Master" the tools of Adobe Photoshop for creating color correct, printable images. Introduction of Web optimization for Photoshop images and Adobe Bridge usage for file management. Students will use channels for color correction and spot color exportation to other applications. Course work will include use of digital cameras; there will also be extended periods of creative freedom. Objective of class is to aid in assembly of portfolio for employment or entry into the Graphic Arts program. Prerequisite: GA 3.161 Digital Image Manipulation II. Corequisites: GA 3.155 Digital Illustration III, GA 3.168 Digital Page Layout III.

GA 3.173 Composition for Designers
(3 class hrs/wk, 3 cr) F
Designed to identify elements common to all areas of design, with attention to how design elements and principles work together to create visual communication. Students will use art media and graphic design computer programs as they apply. Student projects, notebooks, reading and exams will be required to complete the class.

GA 3.174 Basic Color for Designers
(3 class hrs/wk, 3 cr) W
Designed to explore basic color theory and systems for organizing color harmonies and discuss the additional issues graphic designers face when working and printing color. Students will develop solutions for color and design problems. Students will use art media and graphic design computer programs as they apply. Student projects, notebooks, reading and exams will be required to complete the class.

GA 3.175 Digital Photography For Designers
(3 class hrs/wk, 3 cr) W/Sp
Covers basic digital photography skills needed to capture images in both indoor and outdoor settings. Introduces proper exposure settings for aperture, shutter speed, metering, color and light balance. Includes editing of images in Photoshop and preparing images for print. Emphasis on composition, lighting and manual techniques to meet the needs of a variety of applications. Students also will be working with digital cameras for product imaging in a studio setting.

GA 3.181 Special Projects
(2–10 class hrs/wk, 1–6 cr) F/W/Sp
In coordination with the instructor, the student selects projects that provide practical experience within the major field. Note: May be taken for a maximum of six credits. Prerequisite: Instructor's approval.

GA 3.190 Web Design I: Basics
(3 class hrs/wk, 3 cr) F
Introduction to Web page design using industry standard software for the development of HTML-based web sites. Explore site definition, page layout, graphic creation and optimization and implementation of Web sites. Prerequisite: Completion of Digital Imaging Certificate.

GA 3.280S Service Learning: Graphic Design
(9 class hrs/wk, 3 cr) Sp
Graphic Design Service Learning gives students the opportunity to apply their graphic arts skills in direct application with LBCC clubs and programs. Students will identify learning objectives, work with college clubs and programs as clients and engage in faculty lead reflective activities.

GEOG: GEOGRAPHY

GEOG 202 World Geography: Latin America and Caribbean
(3 class hrs/wk, 3 cr) F
Analysis of Latin America/Caribbean according to physical features, environments, political divisions, cultural factors, and human activities/economies—emphasis on effect of geography on human culture. Recommended: College-level reading and writing skills.

GEOG 203 World Geography: Asia
(3 class hrs/wk, 3 cr) W
Analysis of Asia according to physical features, environments, political divisions, cultural factors, and human activities/economies—emphasis on effect of geography on human culture. Recommended: College-level reading and writing skills.

GEOG 204 World Geography: Africa and Middle East
(3 class hrs/wk, 3 cr) Sp
Analysis of Africa and Middle East according to physical features, environments, political divisions, cultural factors, and human activities/economies, with an emphasis on the effect of geography on human culture. Recommended: College-level reading and writing skills.

GS: GENERAL SCIENCE

GS 104 Physical Science: Principles of Physics
●*(5 class hrs/wk, 4 cr) F/W/Sp*
Survey course providing non-science majors a broad background in the fundamentals of physics. No previous science background required. May not be taken for credit if six or more hours of college-level physics have been completed. There is no restriction on the order in which the courses are taken. Prerequisite: MTH 065 Elementary Algebra or equivalent. This course includes a laboratory component.

GS 105 Physical Science: Principles of Chemistry
●*(5 class hrs/wk, 4 cr) F/W/Sp*
Survey course providing non-science majors a broad background in the fundamentals of chemistry. No previous science background required. May not be taken for credit if six or more hours of college-level chemistry have been completed. There is no restriction on the order in which the courses are taken. Prerequisite: MTH 065 Elementary Algebra or equivalent. This course includes a laboratory component.

GS 106 Physical Science: Principles of Earth Science
●*(5 class hrs/wk, 4 cr) F/W/Sp*
Survey course providing non-science majors a broad background in earth science. No previous science background required. Field trips highlight the topics discussed. There is no restriction on the order in which the courses are taken. This course includes a laboratory component.

GS 108 Oceanography
●*(5 class hrs/wk, 4 cr) F/W/Sp*
Introductory lab science course in oceanography that examines the four major categories of oceanographic study: geological, physical, chemical and biological. Emphasizes the geological and geophysical aspects of the sea floor; physical and chemical properties of sea water, waves, tides, ocean circulation and currents; marine ecosystems; and ocean utilization. Prerequisite: MTH 065 Elementary Algebra or equivalent. This course includes a laboratory component.

GS 151 Energy in Society
●*(3 class hrs/wk, 3 cr) F/W/Sp*
Surveys the nature, history and use of energy. Analyzes traditional and alternative energy sources and their scientific, technical, environmental and economic aspects. A weekend field trip is possible.

GS 152 Science, Technology and Society
●*(3 class hrs/wk, 3 cr) F/W/Sp*
Investigates the nature of scientific endeavors and analyzes specific science and technology issues that affect societies in the United States and globally.

GS 152G History of Medicine in the U.S.
●*(3 class hrs/wk, 3 cr) Fall As Needed*
Examines the interplay of society and medicine in the United States from the colonial period to the present. The changing attitude of the public towards health and medicine, the effect of cultural biases and influences, the government's role in research and development. Historical documents and records will be studied to help understand the past and look at our present health care system. This is a writing-intense course. College-level reading and writing (WR 121 English Composition) are strongly recommended for success in this course.

GS 154 Energy & Sustainability
(3 class hrs/wk, 3 cr)
This course teaches students the fundamental concepts and skills related to alternative energy systems including wind, solar, bio-mass and small scale nuclear. Included is the study of personal, agricultural, and industrial energy efficiency. The relationship between energy efficiency, the laws of thermodynamics, economic realities, and technical operations are analyzed in relation to the interaction of societal needs.

GS 170 Field Ecology
●*(1–12 class hrs/wk, 1–3 cr) As needed*
A variety of courses on the biology and ecology of the Northwest. Emphasizes field study of plants, animals, land, water and climate. Includes courses such as Alvord Desert Ecology, Cascade and Crater Lake Ecology, Coastal Ecology and Oregon Old Growth. Note: Most courses involve a weekend trip with pre- and post-trip evening meetings. May be taken as electives by transfer students, but also generally valuable for learning more about the environment.

GS 199 General Science: Special Studies
(1–12 class hrs/wk, 1–4 cr) As needed
Allows a student to investigate, with supervision from a faculty member, a topic of his/her interest at an individualized pace. Credit and projects are determined by the instructor and student.

GS 280B CWE Physical Science
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Designed to give students practical experience in supervised employment related to physical science. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

HD: HUMAN DEVELOPMENT

HD 100 College Success
(4 class hrs/wk, 3 cr) F/W/Sp/Su
Focuses on personal development and behaviors that promote success in college. Topics include communication skills, time management, stress management, goal setting, learning styles and resources for students.

HD 100A College Success
(10 class hrs, 1 cr) F/W/Sp/Su
Focuses on the qualities, traits and behaviors that create success in school and in life.

HD 110A College Planning for Undecided Students
(1 class hr/wk, 1 cr) As needed
Presents all aspects of becoming a college student and relates this information to the student's chosen career area. Students learn about the physical, emotional and intellectual requirements of being a college student at LBCC. The goal is to provide students with information that will facilitate informed decision making as they negotiate the first quarter of college life.

HD 116 Human Potential
(2 class hrs/wk, 2 cr) As needed
Focuses on developing skills to become more self-determining, self-affirming and empathic towards others. Personal strengths, motivation and goals are an integral part of this process.

HD 190 Assertiveness Training
(1 class hr/wk, 1 cr) F/W/Sp
Facilitates the learning of communication skills based on a foundation of respect for self, respect for others, and respect from others.

HD 204 Eliminating Self-Defeating Behavior
(3 class hrs/wk, 3 cr) F/W/Sp/Su
Covers making choices that enhance quality of life, becoming aware of our self-defeating behavior, deciding whether to continue the behavior or change it, and discovering reasons and benefits for choosing this way.

HD 206 Coping Skills for Stress
(2 class hrs/wk, 2 cr) F/W/Sp
Provides information about causes and cures of stress from the point of view of self-talk and the power of our minds to reduce the impact of stress. The class is support oriented and is conducted as part lecture and part group process.

HD 208 Career/Life Planning
(3 class hrs/wk, 3 cr) F/W/Sp
Explores values, interests and skills helpful to individuals desiring directions or change in professional, personal and/or educational goals. This class is grounded in theory and includes experiential exercises, career assessment and information resources.

HD 208A Career Planning
(1class hr/wk, 1 cr) F/W/Sp/Su
Students investigate personal career paths using career assessment tools and techniques and create a career plan.

HD 280S Service Learning
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
An instructional program using contextual learning, designed to promote critical thinking, citizenship and civic responsibility as students work with community partners in addressing real community needs. Students identify work-related learning objectives, work a specified number of hours during the term, and engage in faculty-led guided reflection activities. Prerequisite: Approval by the appropriate faculty coordinator.

HDFS: HUMAN DEVELOPMENT AND FAMILY STUDIES

HDFS 200 Human Sexuality
■*(3 class hrs/wk, 3 cr) W/Sp*
Discusses the biological, social and psychological aspects of human sexual functioning, within a scientific context. Topics include sexual anatomy, sexual response, gender identity, gender roles, sexual orientation, love, contraception, sexually transmitted infections and sexual coercion. Prerequisite: College-level reading and writing skills. WR 121 is strongly recommended for success in this course. Cross-listed as PSY 231.

HDFS 201 Contemporary Families in the U.S.
■*(3 class hrs/wk, 3 cr) F/W/Sp*
An introduction to families with application to personal life. Focuses on diversity in family structure, social class, race, gender, work and other social institutions.

HDFS 222 Partner and Family Relationships
(3 class hrs/wk, 3 cr) Sp
Students become familiar with different family structures and key processes such as communication, power, roles, affection and commitment. They understand how these processes emerge and change over the family life cycle. Students also examine the interface of family processes and social and work relationships.

HDFS 225 Child Development
■*(3 class hrs/wk, 3 cr) F/W/Sp*
Describes basic issues, theories, and current research on child development and development within a family context. Studies the stages of development from conception through early childhood (age 8).

HDFS 229 School Age and Adolescent Development
■*(3 class hrs/wk, 3 cr) F/W/Sp*
Focuses on the development of children ages 5–18 years. All domains of development are covered: cognitive, emotional, language, moral, physical, social, spiritual and volitional. Includes topics for persons interested in working with children in this age range, e.g. curriculum design, school-age care, building relationships and effective guidance.

HDFS 233 Professional Foundations in Early Childhood
(3 class hrs/wk, 3 cr) Sp
Focuses on current issues in working with children and families, e.g. developmentally appropriate practice, ethical issues, service delivery models and assessment practices. Includes the role of professional organizations and resources, family support and philosophical approaches in early childhood programs.

HDFS 248 Learning Experiences for Children
(3 class hrs/wk, 3 cr) F
Focuses on understanding how children learn and develop. Create quality, age-appropriate curricula, which include planning, implementing and evaluating materials and activities that promote language/cognitive, motor and social/emotional development. Emphasizes how to evaluate and integrate subject matter and internet sites for curriculum development and effective use of available materials and resources.

HDFS 249 Infant and Toddler Care
(3 class hrs/wk, 3 cr) As needed
Teaches the elements of quality care for infants and toddlers, including physical, social, emotional, cognitive, and language development, group care techniques and family/provider relationships.

HDFS 261 Working with Individuals and Families
(3 class hrs/wk, 3 cr) W
Develops professional skills and strategies to use when working with individuals and families in a variety of settings. The course focuses on skill building in several areas (written and verbal communication with clients and coworkers, workplace professionalism, identifying and accessing community resources) and explores issues relevant to student success in career goal achievement.

HDFS 280 CWE Child Development
(5–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Provides practical experience in a child and/or family education and/or support program. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Credits are based on identified objectives and number of hours worked. This is a supervised work experience that must be approved by the CWE coordinator prior to enrolling in the class.

HE: HEALTH

HE 110 First Aid and CPR
(9 class hrs, 1 cr) F/W/Sp/Su
Prepares the student in basic first aid and adult CPR and provides information to properly administer the necessary immediate care to an injured or suddenly ill person. An emphasis is placed on early recognition of emergency medical situations and taking appropriate steps to stabilize the victim while activating the emergency medical services system.

HE 112 Emergency First Aid
(8 class hrs, 1 cr) F/W/Sp/Su
Covers basic first aid information in an attempt to prepare the student to properly administer the necessary immediate care to an injured or suddenly ill person. Note: Full day or two evening classes.

HE 125 Occupational Safety and Health
(3 class hrs/wk, 3 cr) F/Sp/Su
Introduces the student to fundamentals of occupational health and safety in regard to accident causation theory and accident prevention, health and safety management, health and safety practices, hazard identification and control, safety history and legislation, workers' compensation practices, and practical aspects of complying with current safety regulations.

HE 151 Drugs in Society
(3 class hrs/wk, 3 cr) F/Sp
Addresses the pharmacology of some popular drugs in Western society. Discusses contemporary issues involving the effects of drug use, misuse and abuse on the individual and society in general.

HE 204 Exercise and Weight Management
(3 class hrs/wk, 3 cr) F/W/Sp
Provides students with scientifically based strategies for controlling and managing weight. Offers students an opportunity to design and monitor participation in a personal weight management program that includes individual assessments, nutritional awareness, stress management and exercise. Since exercise is one of the most crucial factors in healthy weight management, students are encouraged to register for a physical education activity class when they register for this class.

HE 205 Diet and Nutrition: Active Lifestyle
(3 class hrs/wk, 3 cr) F/W/Sp
Students will take an in-depth look at their individual diet. Students will have the opportunity to analyze their current diet and prepare modifications that would improve it. Development of a diet that can improve physical performance and health will be emphasized. Students must be willing to use (not necessarily own) a computer for some class activities.

HE 207 Stress Management
(3 class hrs/wk, 3 cr) F/W/Sp
Students learn the theoretical and scientific basis for the various components of stress, the stress response and the relaxation response. Students learn how to recognize and cope appropriately with physical, occupational, social, school and environmental stressors. The course emphasizes achieving lifestyle balance and shows students how to develop and practice physiologic relaxation techniques and stress reduction methods.

HE 210 Introduction to Health Services
(3 class hrs/wk, 3 cr) W
An introductory overview of the U.S. health care system. Health care financing, inpatient and outpatient health service delivery, government regulatory agencies and topics relating to quality and access will be explored.

HE 220 Introduction to Epidemiology and Health Data Analysis
(3 class hrs/wk, 3 cr) F/W/Sp
Introduction to epidemiology and the use of statistics for students in health-related studies. Designed to provide preparatory background for taking subsequent courses in epidemiology and health data analysis offered by the Department of Public Health. Introduces measure of disease frequency, analytical epidemiology, study designs, experimental design, and basic elements of descriptive statistics and inferential statistics. Prerequisite: Completion of MTH 095: Intermediate Algebra or higher.

HE 225 Social and Individual Health Determinants
(3 class hrs/wk, 3 cr) F/W/Sp
Provides students with an understanding of how social and individual factors and personal choices and behaviors contribute to health, premature death, disease and disability. Existing and emerging health problems and public health strategies and policies are examined.

HE 252 First Aid
(3 class hrs/wk, 3 cr) F/W/Sp
Provides first aid instruction and practice in skills that enable students to take care of themselves and to aid others in the event of an accident or illness.

HE 253 AIDS and Sexually Transmitted Diseases
(3 class hrs/wk, 3 cr) W/Sp
Provides a fundamental understanding of HIV/AIDS and other sexually transmitted disease from a national and global perspective. The history, etiology, epidemiology and prevention strategies will be examined. The course will assist students in developing an understanding of diverse cultures, customs, attitudes, values and beliefs in the context of disease transmission and eradication.

HE 256 Foundations of Public Health Promotion in Education
(3 class hrs/wk, 3 cr) Sp
Provides the history and evolution as well as the current status of health promotion programs and public health services in the U.S. The course will focus on the influences on health behavior, and the contexts in which population, health and disease can be positively influenced by individuals, groups, and communities. Professional standards, roles and competencies, and current issues in health promotion/disease prevention practice will also be addressed.

HE 261 Cardiopulmonary Resuscitation (CPR)
(8 class hrs, 1 cr) F/W/Sp/Su
Designed to teach the skills of CPR and relief of foreign body airway obstruction (FBAO) for victims of all ages. It is intended for participants who may need to perform CPR or airway obstruction techniques in a wide variety of settings.

HE 261A CPR for Professional Rescuers
(8 class hrs, 1 cr) F/W/Sp/Su
The Professional Rescuer course is designed to teach the skills of CPR for victims of all ages (including ventilation with a barrier device, a bag-mask device and oxygen), use of an automated external defibrillator (AED) and relief of foreign-body airway obstruction (FBAO). It is intended for participants who provide health care to patients in a wide variety of settings.

HE 263 Psychosocial Dimensions of Health
(3 class hrs/wk, 3 cr) W
Provides an overview of the mind body relationship and its effects on health and illness. Examines the social, psychological, cultural, attitudinal, behavioral and environmental factors that influence individual and public health.

HE 280 CWE Health
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
An instructional program designed to give students practical experience in supervised employment related to health. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. CWE coordinator's approval required.

HS: HUMAN SERVICES

HS 205 Youth Addiction
(3 class hrs/wk, 3 cr) As needed
Designed to assist students in working with youth who are chemically dependent. Includes prevention, intervention, assessment, individual, group and continuing recovery techniques.

HST: HISTORY

HST 101 History of Western Civilization
■*(3 class hrs/wk, 3 cr) F*
Surveys the origins and development of western civilization from its beginning through the High Middle Ages. Includes the civilizations of Mesopotamia, Egypt, Greece, and Rome, and the emergence of Europe during the early Middle Ages. Recommended: College-level reading and writing skills.

HST 102 History of Western Civilization
■*(3 class hrs/wk, 3 cr) W*
Surveys western civilization from the Middle Ages through the American and French Revolutions. Other topics are the Renaissance, the Scientific Revolution, and the Enlightenment. Recommended: College-level reading and writing skills.

HST 103 History of Western Civilization
■*(3 class hrs/wk, 3 cr) Sp*
Surveys western civilization from the Industrial Revolution through the modern era. Also includes Romanticism, the Revolutions of 1830 and 1848, Imperialism, World Wars I and II and the Cold War. Recommended: College-level reading and writing skills.

HST 150 Science and Culture in the Western Tradition
(3 class hrs/wk, 3 cr) As needed
Survey of Western European cultural heritage with emphasis on scientific and technology innovations since the Middle Ages. Emphasis on the interaction between scientific developments and cultural developments.

HST 157 History of the Middle East and Africa
■*(3 class hrs/wk, 3 cr) As needed*
Surveys the cultural, social, economic and political development in the Middle East and Africa. Recommended: College-level reading and writing skills.

HST 158 History of Latin America
■*(3 class hrs/wk, 3 cr) W*
Surveys the cultural, social, economic and political development of Latin America. Recommended: College-level reading and writing skills.

HST 159 History of Asia
■*(3 class hrs/wk, 3 cr) As needed*
Surveys the cultural, social, economic and political development of Asia. Recommended: College-level reading and writing skills.

HST 198 Research Topics
(1 class hr/wk 1 cr) F/W/Sp
Examines in-depth history topics for independent research. Instructor's approval required.

HST 201 U.S. History: Colonial and Revolutionary
■*(3 class hrs/wk, 3 cr) F*
Provides an overview of the United States from pre-Columbian North American and European antecedents to colonization, Colonial America, Revolutionary America; development of U.S. government, economy and society to 1830. Recommended: College-level reading and writing skills.

HST 202 U.S. History: Civil War and Reconstruction
■*(3 class hrs/wk, 3 cr) W*
Provides an overview of the history of the United States from 1830 to 1900. Includes national expansion, sectionalism, the Civil War and Reconstruction. Concludes with the second Industrial Revolution and its effects Recommended: College-level reading and writing skills.

HST 203 U.S. History: Rise to World Power
■*(3 class hrs/wk, 3 cr) Sp*
Provides an overview of the United States in the 20th century. Examines the rise to global power, World Wars I and II, civil rights, labor, women's rights and the Cold War. Recommended: College-level reading and writing skills.

HST 280 CWE History
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
An instructional program designed to give students practical experience in supervised employment related to history. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. CWE coordinator's approval required.

HST 280S Service Learning: History
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
An instructional program, using contextual learning, designed to promote critical thinking, citizenship and civic responsibility as students work with community partners in addressing real community needs. Students identify learning objectives, work a specified number of hours during the term, and engage in faculty-led guided reflection activities. Prerequisites: Students must have taken or must be currently taking appropriate course or courses in their major field of study. They must also have their Service-Learning approved by the appropriate faculty coordinator.

HSTS: HISTORY OF SCIENCE

HSTS 151 History of Science
(3 class hrs/wk, 3 cr) W
Introduces the history of science from earliest civilizations to the present. Emphasizes the evolution of scientific concepts, with particular attention given to Galileo, Newton, Darwin and other prominent figures. Critical thinking skills are utilized and developed as students address the conflicts between previously accepted scientific concepts and theories and current understanding. Also addressed are the interactions between scientific knowledge and the effects of this knowledge upon the technological, religious, economic, and social aspects of civilization.

HT AND HORT: HORTICULTURE

HT 8.102 Career Exploration: Horticulture
(1 class hrs/wk, 1 cr) W
Surveys career opportunities in horticulture. A report on a specific career position is required. Includes résumé writing and job search skills.

HT 8.115 Greenhouse Management
(4 class hrs/wk, 3 cr) Sp
Introduces greenhouse management emphasizing practical applications in the horticulture industry. Topics include growing structures and environment, root media containers, watering, plant nutrition, pest management and plant growth. Includes an interview with a greenhouse operator.

HT 8.132 Arboriculture I
(4 class hrs/wk, 3 cr) W/Alternate years, Winter 2011
Introduces ornamental horticulture, including how to plant, train, prune, protect and repair trees.

HT 8.133 Arboriculture II
(4 class hrs/wk, 3 cr) Sp/Alternate years, Spring 2011
An advanced course of study for students and practitioners of ornamental horticulture who need to know how to select, plant, train, protect, fertilize, and provide ongoing care for trees in the landscape. Class provides excellent preparation for the ISA Certified Arborist and Tree Worker certification exams. Students must sign an LBCC Liability Waiver before participating in the lab. Lab activities include actual tree care practices on campus. Prerequisite: Arboriculture I or instructor's approval.

HT 8.135 Turf Management
(4 class hrs/wk, 3 cr) W/Alternate years, Winter 2012
Introduces and develops the art and science of turf-grass culture. Grass identification and maintenance; fertilizer and water requirements; weed, insect and disease identification and control; and other turf problems are emphasized.

HT 8.137 Plant Propagation
(6 class hrs/wk, 4 cr) W
Introduces the principles, methods, techniques and facilities used to propagate ornamentals. Techniques covered include seeding, grafting, cuttings, divisions and tissue culture. Lab activities utilize the LBCC greenhouse. Students are responsible for the annual plant sale.

HT 8.139 Arboriculture Practicum
(3 class hrs/wk, 2 cr) Sp/Alternate years, Spring 2011
Gives practical field experience in climbing and tree work. Taught by certified arborists, emphasizing safety and skill. Note: Limited enrollment. Requires personal protective equipment. Prerequisites: Instructor's approval.

HT 8.140 Landscape Maintenance
(5 class hrs/wk, 3 cr) F/Alternate years, Fall 2011
Introduces principles, methods, techniques and use of equipment for maintenance of landscape and turf areas.

HORT 199 Horticulture: Special Studies
(1–9 class hrs/wk, 1–12 cr) F/W/Sp
Allows a student to investigate, with supervision from a faculty member, a topic of his/her interest at an individualized pace. Credits and projects will be determined jointly by the instructor and the student.

HORT 211 Horticulture Practicum
(9 class hrs/wk, 3 cr) F/W/Sp
Students learn various aspects of practical horticulture by working as a part of a team managing the LBCC greenhouse, organic garden and landscape areas. Students learn basic procedures of plant propagation, soil, water, fertilizer and pest management. Seasonal projects parallel Horticulture classes.

HORT 226 Landscape Plant Materials
(4 class hrs/wk, 3 cr) F/Alternate years, Fall 2012
Identification of trees, shrubs, vines and groundcovers used in landscape horticulture and their use in plant composition.

HORT 228 Landscape Plant Materials
(4 class hrs/wk, 3 cr) Sp
Includes identification of trees, shrubs, vines and ground covers used in landscape horticulture and their use in plant composition.

HORT 255 Herbaceous Ornamental Plants
(4 class hrs/wk, 3 cr) Sp
The identification and culture of herbaceous plant materials including perennials, annuals, groundcovers, ornamental grasses, and bulbs commonly grown in Oregon. Develops plant identification skills using recognition of visual details of form, texture, size, leaves, flowers, and fruit.

HORT 260 Organic Farming and Gardening
(4 class hrs/wk, 3 cr) Sp
Organic farming and gardening methods are discussed in class and practiced in the field. The philosophical background of organic farming as well as the biological, environmental and social factors involved in organic food production are covered. Emphasis is on hands-on application of scientific principles to create sustainable food production systems.

HORT 280 Introduction to Landscape Design
(5 class hrs/wk, 3 cr) W
Students learn how to develop functional, aesthetically pleasing and environmentally responsible landscapes. Site assessment, basic design principles, plant selection, and drafting skills will be emphasized.

HUM: HUMANITIES

HUM 101 Introduction to Humanities: Prehistory, Medievalism and World Beyond
➢ *(3 class hrs/wk, 3 cr) F*
Examines creativity, ideas, and culture through study of selected works and artifacts from Western and non-Western cultures, drawn from art, architecture, literature, philosophy, drama, music, dance and theater, as reflections of and influences on social and cross-cultural change. Attendance at out-of-class activities is required. HUM 101: Prehistory, Medievalism and World Beyond; HUM 102 Renaissance, Faith and Reason in Global Encounter; HUM 103 Modernism, Globalism and Information Age. Courses may be taken individually and/or in any order. College-level reading and writing skills are strongly recommended for success in this course.

HUM 102 Introduction to Humanities: Renaissance, Faith and Reason in Global Encounter
➢ *(3 class hrs/wk, 3 cr) W*
Examines creativity, ideas, and culture through study of selected works and artifacts from Western and non-Western cultures, drawn from art, architecture, literature, philosophy, drama, music, dance and theater, as reflections of and influences on social and cross-cultural change. Attendance at out-of-class activities is required. HUM 101: Prehistory, Medievalism and World Beyond; HUM 102 Renaissance, Faith and Reason in Global Encounter; HUM 103 Modernism, Globalism and Information Age. Courses may be taken individually and/or in any order. College-level reading and writing skills are strongly recommended for success in this course.

HUM 103 Introduction to Humanities: Modernism, Globalism and Information Age
➢ *(3 class hrs/wk, 3 cr) Sp*
Examines creativity, ideas, and culture through study of selected works and artifacts from Western and non-Western cultures, drawn from art, architecture, literature, philosophy, drama, music, dance and theater, as reflections of and influences on social and cross-cultural change. Attendance at out-of-class activities is required. HUM 101: Prehistory, Medievalism and World Beyond; HUM 102 Renaissance, Faith and Reason in Global Encounter; HUM 103 Modernism, Globalism and Information Age. Courses may be taken individually and/or in any order. College-level reading and writing skills are strongly recommended for success in this course.

HV: HEAVY EQUIPMENT/DIESEL

HV 3.123 Fundamental Shop Skills
(4 class hr/wk, 3 cr) F
Gives the student practical working knowledge of safety in the trade areas of employment. Uses safety regulatory agencies as a foundation, and also includes fork lift training. Students will complete online training specific to safety and pollution prevention. Prerequisite: Placement at RD 090 College Success & Reading Strategies and MTH 020 Basic Mathematics or higher and instructor's approval required.

HV 3.129 Heavy Equipment/Diesel Engines
(12 class hrs/wk, 1–7 cr) W
Covers the operating principles, maintenance, repair and overhaul of various types and sizes of diesel engines. Diesel engines, their component parts and related accessories are studied in depth. In conjunction with this is the study of manufacturers' specifications as they pertain to correct engine operation, performance and emissions. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

HV 3.130 Heavy Equipment/Diesel Tune-Up
(20 class hrs/wk, 1–10 cr) Sp
Capstone class that introduces diesel tune-up and techniques for optimum engine performance including diagnostic troubleshooting, engine break-in procedure through use of the dynamometer. The student will use all of the critical thinking skills they have learned in the past classes to solve real world problems on mechanical and computer managed engines and trucks. This class also includes the ITS diesel club. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

HV 3.132 Advanced Mobile Hydraulics
(8 class hrs/wk, 5 cr) Sp
Covers advanced hydraulic theory along with service and repair of valves, pumps, motors and connectors used in mobile equipment hydraulic systems. Systems design and modification will be covered. Machine systems will be learned using hydraulic schematic drawings. Common customer concerns with specific heavy equipment and their solutions will be taught. Operational check-out and laptop computer testing of heavy equipment will be performed in labs, as well as repair and adjustment and electronic controls. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics or higher; HV 3.134 Basic Hydraulics; and instructor's approval required.

HV 3.134 Basic Hydraulics
(5 class hrs/wk, 3 cr) W
Covers hydraulic theory along with pump, actuator application, and valve design and theory. Prerequisite: Placement test scores at RD 090 Strategies for Effective Reading, MTH 020 Basic Mathematics or higher; HV 3.134 Basic Hydraulics; and instructor's approval required.

HV 3.146 Pneumatic Brakes and Controls
(10 class hrs/wk, 1–5 cr) W
Acquaints the student with the theory and application of pneumatic braking systems. The student will learn to service, diagnose and repair ABS, foundation, accessory and safety air systems. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

HV 3.295 Power Train Systems
(20 class hrs/wk, 1–10 cr) F
Studies include power train terminology, theory and operation, driveshaft function and construction, maintenance practices, power train schematics, troubleshooting and failure analysis, and component rebuild and replacement. Students will use electronic resources such as John Deere Service Advisor and Cat SIS technical manuals to perform required tasks. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

HV 3.296 Steering, Suspension and Brakes
(10 class hrs/wk, 1–5 cr) Sp
Covers the theory and operation of heavy duty steering and suspension systems, alignment and brakes. Diagnostic and service techniques are taught with the use of components and vehicles. Learning strategies include multi-media presentations, discussion research and lab practice. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

HV 3.297 Electrical and Electronic Systems
(20 class hrs/wk, 1–10 cr) F
Introduces the theory, application and diagnosis of the electrical and electronic control systems for modern vehicles. Emphasis is placed on batteries, starting, charging, lighting, accessories and driver information systems. Preparation for ASE certification in electrical/electronic systems. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

HV 3.303 Mobile Air Conditioning and Comfort Systems I
(5 class hrs/wk, 3 cr) Sp
Principles of mobile heating and air conditioning systems with an emphasis on design, function, adjustment, service and testing of components. Prerequisite: Placement test scores at RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics, HV 3.297 Electrical and Electronic Systems, and instructor's approval required.

HV 3.643 Customer Service
(2 class hr/wk, 2 cr) F
This course is designed to help students develop outstanding customer service skills in a dealership setting serving clients/customers. Students will learn how to interact with customers (communicating in person), resolve conflicts, maintain records, understand the importance of customer satisfaction/retention, actively participate as a member of a team, and develop time management skills. Prerequisite: Placement test scores for RD 090 College Success & Reading Strategies, MTH 020 Basic Mathematics and instructor's approval required.

IN: INDUSTRIAL TECHNICAL

IN 1.197 Introduction to Industrial Computers
(2 class hrs/wk, 1 cr) W
Introduces students to basic applications of computers in industry; a variety of applications including Windows, Word, Excel, AutoCAD©, and PLC programming basics. Students will have hands-on opportunities with these applications and will be able to identify strengths and weaknesses.

JN: JOURNALISM

JN 134 Introduction to Photojournalism
(4 class hrs/wk, 3 cr) F/Sp
Introduces students to photojournalism traditions and techniques, from taking photos for publication to exploring the law, ethics and history of documentary photography and its impact on audiences. Covers topics such as taking photos for story-telling, evaluating images for relevance and impact, basic camera techniques and digital reproduction and online presentation. Includes digital photo lab work. Basic digital photography experience suggested, though not required.

JN 201 Media and Society
(4 class hrs/wk, 4 cr) F/W/Sp
Studies the history, development, technology and social impact of the various mass media. Includes critical analysis of media practice and ethics, the study of significant figures and developments, and the examination of the media as channels of expression in popular culture.

JN 215A Journalism Lab
(2 class hrs/wk, 1 cr) F/W/Sp
Offers supervised editorial work on the college's student newspaper (The Commuter) in reporting and editing. Provides training and experience with computerized word processing. Note: Course serves as the lab for JN 216 News Reporting and Writing and JN 217 Feature Writing. May be taken independently from those courses. May be repeated for up to six credits.

JN 215B Design and Production Lab
(4 class hrs/wk, 2 cr) F/W/Sp
Offers supervised experience in newspaper page design, headline writing, computer pagination, digital imaging, photography, advertising and related newspaper production skills. Students apply skills in production lab for the college's student newspaper (The Commuter). May be repeated for up to six credits.

JN 216 News Reporting and Writing
(3 class hrs/wk, 3 cr) F/Sp
Introduces basics of reporting and journalistic writing, including news style, grammar and story structure. Students also study journalism history, literature, ethics, law and critical thinking as applied to information gathering. Corequisite: JN 215A Journalism Lab.

JN 217 Feature Writing
(3 class hrs/wk, 3 cr) W
Covers various forms of nonfiction writing, including profiles, human interest, and analysis, with an emphasis on backgrounding, depth reporting and descriptive writing. Continues examination of issues in journalism history, literature, ethics and law. Prerequisite: College-level reading and writing skills (WR 121) are strongly recommended for success in this course. Corequisite: JN 215A Journalism Lab.

JN 280 CWE Journalism
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
An instructional program designed to give students practical experience in supervised journalism-related employment. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

MA: MACHINE TOOL

MA 3.396 Manufacturing Processes I
(12 class hrs/wk, 6 cr) F/W/Sp
Provides training in the skills necessary to pursue a career in the machinist's trade. The lecture portion of Manufacturing Processes I introduces students to the fundamentals of good machining practices; theory/practical considerations are covered. In the laboratory aspect of this course each student completes a series of projects that emphasize safe operation of machine tools. The safety aspect of the course includes:

- Prevention of accidents, injuries and illness at the work site.
- Measures that provide protection from exposure to hazards and hazardous materials.
- Legal obligations mandated by OR-OSHA that directly relate to future occupations.

MA 3.396B Manufacturing Processes I
(3 class hrs/wk, 2 cr) F/W/Sp
This course provides training and learning experiences in basic machining operations. Students will be using the lathe, milling machine and other machine tools to complete a project. The finished projects are used to participate in a contest; judging is based on performance, craftsmanship and technology utilization. Students are required to demonstrate some design responsibilities. Skills for successful employment are emphasized.

MA 3.397 Manufacturing Processes II
(12 class hrs/wk, 6 cr) F/W/Sp
Provides machine tool technology training and learning opportunities at an intermediate level. Instruction will be given in the safe and efficient operation of machine tools. Theory and practical considerations will be covered. Environmental awareness information is included in this course. Prerequisite: MA 3.396 Manufacturing Processes I or instructor's approval.

MA 3.397B Manufacturing Processes II
(3 class hrs/wk, 2 cr) F/W/Sp
This lecture/lab course provides machine tool technology training and learning opportunities at an intermediate level. Instruction will be given in the safe and efficient operation of machine tools. Theory and practical considerations will be covered. Environmental awareness information is included in this course. Prerequisite: MA 3.396B Manufacturing Processes I or instructor's approval.

MA 3.398 Manufacturing Processes III
(12 class hrs/wk, 6 cr) F/W/Sp
Focuses on advanced machine tool operation. Determining machine tool selection, set-up and planning for multi-tool projects will be covered. Shop math, including trigonometry and elementary algebra will be used to make calculations. Students will complete a series of advanced machining projects. A career specialist will deliver information about job search skills. Prerequisite: MA 3.397 Manufacturing Processes II.

MA 3.398B Manufacturing Processes III
(3 class hrs/wk, 2 cr) F/W/Sp
This lecture/lab course focuses on advanced machine tool operation. Determining machine tool selection, setup and planning for multi-tool projects will be covered. Shop math, including trigonometry and elementary algebra, will be used to make calculations. Students will complete a series of machining projects. This course includes instruction on basic computer numerical control (CNC) machining and turning. Prerequisite: MA 3.397B Manufacturing Processes II or instructor's approval.

MA 3.405 Inspection I
(2 class hr/wk, 2 cr) F
This course provides training and learning opportunities in the science of measurement as it relates to manufacturing. The correct use of measuring tools to collect data at logical intervals throughout the manufacturing process will be covered. Students will be introduced to some of the practical considerations that relate to size, tolerance and other specifications. The measuring tool we will be studying include inch and metric rulers, micrometers, dial and digital calipers, the surface plate, sine bars, gage blocks and the combination set.

MA 3.406 Inspection II
(2 class hrs/wk, 2 cr) W
Provides training in measurement as it relates to manufacturing, Geometric Dimensioning and Tolerancing (GD&T), surface plate inspection methods and tools, optical comparator, surface roughness, inspection of threads and other topics will be covered. Includes information on human relations skills including: working cooperatively as a member of a team or manufacturing cell, customer relations, and working with diverse populations.

MA 3.407 Mathematics for NC Machinists
(1 class hr/wk, 1 cr) F
Provides mathematics training for NC machinists and programmers. Scientific calculator functions, basic algebra, right angle trigonometry, geometry and the Cartesian coordinate system as it applies to CNC machining will be covered.

MA 3.409 Introduction to CNC
(2 class hrs/wk, 2 cr) F
Introduces students to computer numerical control.

MA 3.412 Cam I
(3 class hrs/wk, 3 cr) W
Provides training in the use of Mastercam, Computer Aided Manufacturing (CAM) software. Students learn how to create accurate part geometry, select tools, specify toolpaths and generate Computer Numeric Control (CNC) machine code. A primary focus of this course is Mastercam applications as they relate to Turning Center operations.

MA 3.413 Lean Manufacturing and Productivity
(1 class hr/wk, 1 cr) F
Provides training in Lean Manufacturing strategies. Reducing manufacturing costs is a primary focus of this course. Emphasis is placed on human relations in a lean manufacturing environment.

MA 3.414 Tool Technology
(1 class hr/wk, 1 cr) F
Helps meet the need in industry for machinists that are trained in carbide insert identification and applications.

MA 3.416 CNC: Special Projects
(2–6 class hrs/wk, 1–3 variable credit) Sp
Provides advanced computer numerical control (CNC) training. Students will have some design responsibilities as well as design for manufacturing responsibilities as they complete projects. Careful planning, good machining practices, economic/business concerns, documentation and safety will be emphasized. Prerequisite: MA 3.420 CNC: Mill, MA 3.421 CNC: Lathe, MA 3.427 Introduction to Solid Design Manufacturing, MA 3.427 Solid Works I, equivalent experience, or instructor's approval.

MA 3.420 CNC: Mill
(6 class hrs/wk, 4 cr) F/W
Provides training in the operation and part programming of the modern vertical machining center. Students learn safe manufacturing methods by completing a series of assignments using one of two Haas vertical machining centers. Students will gain experience reading, writing and editing part programs using industry standard G and M code programming.

MA 3.421 CNC: Lathe
(6 class hrs/wk, 4 cr) W/Sp
Introduces students to a modern CNC turning center and part programming using industry standard ISO/EIA machine code for the Fanuc controller. Students turn aluminum parts to specifications on a Hitachi Seiki CNC Lathe. Safety procedures are emphasized. Prepares students for mastery of the two axis lathe coordinate plane. Prerequisite: MA 3.396 Manufacturing Processes I or instructor's approval.

MA 3.427 SolidWorks I
(3 class hrs/wk, 3 cr) W
Provides advanced training and learning experiences in SolidWorks mechanical design automation application software. This software makes it possible for designers to quickly sketch out ideas, experiment with features and dimensions, and produce models and detailed drawings.

MA 3.428 SolidWorks II
(3 class hrs/wk, 3 cr) Sp
Provides advanced training and learning experiences in SolidWorks mechanical design automation application software. This software makes it possible for designers to quickly sketch out ideas, experiment with features and dimensions, and produce models and detailed drawings. This course is the second in the series. Prerequisite: MA 3.427 SolidWorks I or instructor's approval.

MA 3.431 Basic Print Reading: Metals
(2 class hrs/wk, 2 cr) F
Provides training in interpreting blueprints.

MA 3.432 Introduction to Mastercam
(3 class hrs/wk, 3 cr) F
Introduction to Mastercam provides training on the use of Mastercam CAD/CAM software to design parts and toolpaths for a modern CNC vertical machining center. Students complete a series of exercises that progress from designing a two-dimensional part and creating a contour toolpath to more advanced CNC mill applications. Safety and efficient machining will be stressed throughout the course.

MA 3.433 Mastercam II: Surfaces
(3 class hrs/wk, 3 cr) W
Second course in the three-course Mastercam series. Students complete a series of exercises that include building more advanced surface toolpaths. Prerequisite: MA 3.432 Introduction to Mastercam or instructor's approval.

MA 3.434 Mastercam III: Solids
(3 class hrs/wk, 3 cr) Sp
Third course in the mastercam series. Introduces students to solid modeling as it relates to CAD/CAM/CNC technology. Practical examples of current manufacturing methods are used for the exercises. Students are encouraged to assume design responsibility when working through projects. Prerequisite: MA 3.433 Mastercam II: Surfaces.

MA 3.437 Materials Science
(3 class hrs/wk, 2 cr) Sp
Investigates the relationships that exist between structures and the properties of materials. The study of atomic structure and chemical makeup provides the basis for material classification. Lecture topics include bonding forces, unit cells, crystal structures, phase transformation and plastic deformation in polycrystalline materials. The emphasis is on ferrous metals. Non-ferrous metals. ceramics, polymers and composite materials will be included.

MA 3.438 Manufacturing Processes IV
(12 class hrs/wk, 6 cr) F/W/Sp
This course focuses on the manufacturing skills that are required of persons interested in a career in the machinist's trade. A student and the instructor discuss career goals and together select an advanced machine shop project that demonstrates the skills that are required to achieve the student's objectives. An emphasis on quality work, good planning and good shop safety procedures are key aspects of this course. Prerequisite: MA 3.398 Manufacturing Processes III.

MA 3.439 Manufacturing Processes V
(12 class hrs/wk, 6 cr) F/W/Sp
This course focuses on advanced manufacturing skills that are required of persons interested in a career in the machinist's trade. A student and the instructor discuss career goals and together select an advanced machine shop project that demonstrates the skills that are required to achieve the student's objectives. An emphasis on quality work, good planning and good shop safety procedures are key aspects of this course. Prerequisite: MA 3.398 Manufacturing Processes III.

MO: MEDICAL OFFICE

MO 5.414 Drug Names and Classifications
(3 class hrs/wk, 3 cr) W/Sp/Sp
Prepares student training to work as a member of a health care team to effectively communicate pharmaceutical information to a variety of health care professionals using correct spelling and pronunciations of selected pharmaceuticals, which will help ensure patient safety in pharmaceutical usage. Prerequisite: MO 5.630 Medical Terminology and Body Systems I or equivalent experience.

MO 5.415 Advanced Drug Names and Classifications
(2 class hrs/wk, 2 cr) F
Prepares student to work as a member of a health care team to effectively communicate pharmaceutical information to a variety of health care professionals, using correct spelling, pronunciation and patient safety techniques. Also prepares student to assist physicians in avoiding adverse reactions, drug interactions, and generic v. brand duplications. Prerequisite: MO 5.414 Drug Names and Classifications.

MO 5.532 Medical Terminology/Phlebotomists
(2 cr) As needed
Phlebotomy students will learn basic medical language in written and oral forms to communicate as members of a health care professional team and to understand the basics of physician's diagnosis and treatment that influence blood draws.

MO 5.550 Human Relations in Health Care
(3 class hrs/wk, 3 cr) F
Prepares students to understand the mental process and behaviors of individuals in the medical office.

MO 5.625 Basic Clinical Office Procedures
(8 hrs/wk, 5 cr) F
Students prepare patients, assist medical personnel, and provide aseptic environments in ambulatory care settings. Prerequisite: MO 5.632 Medical Terminology and Body Systems III. Enrollment in Administrative Medical Assistant or Medical Assistant programs.

MO 5.626 Advanced Clinical Office Procedures
(8 class hrs/wk, 5 cr) W
Continuation of Basic Clinical Office Procedures. Medical assistant students will assist, perform, and document advanced, invasive and sterile procedures using standard precaution guidelines without causing undo harm or discomfort to patients. Prerequisite: MO 5.625 Basic Clinical Office Procedures; OA 2.515MA Business Math Medical II.

MO 5.630 Medical Terminology and Body Systems I
(3 class hrs/wk, 3 cr) F/W/Sp/Su
Prepares students to use basic medical language in written and oral form to communicate as a member of a health care professional team and understand the basics of physician's diagnosis and treatment.

MO 5.630A Medical Terminology I ESOL Bridge
(3 hrs/wk, 3 cr) As needed
Prepares students to use basic medical language in written and oral form to communicate as a member of a health care professional team and understand the basics of physician's diagnosis and treatment. This class is designed to be a bridge class for non-native students to enter the health-occupations career path.

MO 5.631 Medical Terminology and Body Systems II
(3 class hrs/wk, 3 cr) F/W/Sp/Su
Prepares students to use an expanded medical vocabulary to communicate with health care professionals. Will recognize the structure and function of the human body, basic pathology and diagnostic tools. Prerequisite: MO 5.630 Medical Terminology and Body Systems I.

MO 5.632 Medical Terminology and Body Systems III
(3 class hrs/wk, 3 cr) F/W/Sp/Su
This course builds upon Medical Terminology and Body Systems I and II to provide a comprehensive knowledge of medical terminology. Students will communicate, document, and comprehend terminology as it pertains to medical specialties, reports, and patient data. Prerequisite: MO 5.631 Medical Terminology and Body Systems II.

MO 5.640 Administrative Externship
(9 class hrs/wk, 1–3 cr) F/W/Sp
Students apply all major medical administrative competencies and concepts learned in the curriculum to a real-world experience in local medical facilities. Prerequisite: All administrative courses must be completed prior to entering externship. Prior work experience will be evaluated on an individual basis.

MO 5.641 Clinical Externship
(18 class hrs/wk, 1–6 cr) F/W/Sp
Students apply all major clinical competencies and concepts learned in the two-year medical assistant program to a real-world experience in local medical facilities. Prerequisite: Completion of MO 5.640 Administrative Externship.

MO 5.650 Basic Electrocardiography Techniques
(1 class hrs/wk, 1 cr) W
Prepares the medical assistant to perform electrocardiograms in the clinical setting. Prerequisites: Enrollment in Medical Assistant Program; MO 5.625 Basic Clinical Office Procedures.

MO 5.655 Phlebotomy for Medical Assistants
(3 class hrs/wk, 2 cr) W
Medical assistant students will collect patient blood samples without undue harm to the patient and without compromising the integrity of the sample. Prerequisites: Enrollment in Medical Assistant Program; MO 5.625 Basic Clinical Office Procedures.

MO 5.661 Physician's Office Laboratory Procedures
(4 class hrs/wk, 3 cr) F
Medical assistant students will perform CLIA-waived tests in a physician's office laboratory using quality control and practicing safety precautions. Prerequisite: MO 5.631 Medical Terminology and Body Systems II. Corequisite: MO 5.625 Basic Clinical Office Procedures; enrollment in Medical Assistant Program.

MO 5.662 Preparation for Certifying Exam (Clinical)
(1 class hr/wk, 1 cr) Sp
Medical assistant students review clinical competencies to prepare for the national certification exam administered by the American Association of Medical Assistants. Prerequisite: Must be enrolled in MO 5.641 Clinical Externship of the Medical Assistant Program.

MO 5.665 Documentation and Screening in the Medical Office
(2 class hrs/wk, 2 cr) W/Sp
Prepares medical office personnel to answer telephone, assess and document conversation, and disseminate information in an ambulatory care setting. Develops and uses a physician-authorized telephone screening manual. Prerequisite: MO 5.630 Medical Terminology and Body Systems I and OA 202 Word Processing for Business: MS Word. Corequisite: OA 2.671 Medical Law and Ethics.

MP: MUSICAL PERFORMANCE

Each MP class may be taken three times for credit.

MP 101 Symphonic Band
(3 class hrs/wk, 1 cr) W/Sp/F
In conjunction with the Oregon State University Department of Music, provides an opportunity for participation in a symphonic band. Note: May require an audition. An unsuccessful audition will result in disenrollment.

MP 102 Concert Band
(3 class hrs/wk, 1 cr) F/W/Sp
In conjunction with the Oregon State University Department of Music, provides an opportunity for participation in a concert band. Note: May require an audition. An unsuccessful audition will result in disenrollment.

MP 103 Marching Band
(3 class hrs/wk, 1 cr) F
Provides opportunity for participation in a marching band in conjunction with the Oregon State University Department of Music. This performance group of more than 160 musicians performs for home football games as well as one trip each year to an off-campus game. Note: May require an audition. An unsuccessful audition will result in disenrollment.

MP 104 Pep Band
(1.5 class hrs/wk, 1 cr) W
Instrumental performing group concentrating on rock, pop and contemporary styles in the small- to medium-size group setting. Provides an opportunity for performance and participation in the OSU Basketball Pep Band in conjunction with the Oregon State University Department of Music. Note: Each class may be taken three times for credit. May require an audition. An unsuccessful audition will result in disenrollment.

MP 105 Jazz Band
(2 class hrs/wk, 1 cr) Sp
In conjunction with the Oregon State University Department of Music, provides an opportunity for participation in a jazz band. Note: May require an audition. An unsuccessful audition will result in disenrollment.

MP 122 Concert Choir
(3 class hrs/wk, 2 cr) F/W/Sp
Concert choir is a traditional choral performance class that includes the singing of a wide range of choral music from around the world. Participation in final concert is required. This ensemble is open to all members of the college community. Audition for vocal placement.

MP 131 Chamber Choir
(3 class hrs/wk, 2 cr) F/W/Sp
Chamber choir (''Re-Choired Element'') is a performing group that includes singing and performing advanced choral literature, including madrigals, motets, jazz arrangements and music theater. Students will develop high-level sight reading and aural skills. Participation in this course may include a number of off-campus performances as well as final concert. Prerequisite: Audition and Instructor Permission. Recommended: Take MP 122 Concert Choir concurrently.

MP 141 Symphony Orchestra
(3 hrs/wk, 1 cr) F/W/Sp
In conjunction with the Oregon State University Department of Music, provides opportunity for participation in a symphony orchestra. This large ensemble of 65–80 players performs orchestra repertoire from the 18th, 19th and 20th centuries. Note: May require an audition. An unsuccessful audition will result in disenrollment.

MP 146 Women's Chorus
(2 class hrs/wk, 1 cr) F/W/Sp
A choral performance ensemble that includes the singing of a variety of choral music from around the world. Participation in final concert is required. Corequisite: Students in the ensemble are strongly encouraged to participate in either MP 122/222 Concert Choir or MP 131/231 Chamber Choir. Consult with the course instructor for vocal placement.

MP 147 Men's Chorus
(2 class hrs/wk, 1 cr) F/W/Sp
Men's Chorus is a choral performance ensemble that includes the singing of a variety of choral music from around the world. Participation in final concert is required. Corequisite: Students in the ensemble are strongly encouraged to participate in either MP 122/222 Concert Choir or MP 131/231 Chamber Choir. Consult with the course director for proper vocal placement.

MP 151 Rehearsal and Performance
(3–20 class hrs/wk, 1–3 cr) As needed
Offers credit for music rehearsal directly related to Performing Arts Department performance. Instructor's approval required.

MP 171 Individual Lessons: Piano
(0.5-1 class hrs/wk, 1-2 cr) F/W/Sp/Su
Individual piano lessons are designed to facilitate the student's general music background and to address their skill level on the piano. Attention is also given to the individual's goals in learning to play the piano and an interest they may have in learning to play particular styles of piano music. Each level may be repeated 3 times for credit.

MP 174 Individual Lessons: Voice
(0.5-1 class hrs/wk, 1-2 cr) F/W/Sp/Su
Provides individual instruction in voice. Student will focus on improving vocal technique in a variety of areas such as pitch matching, breath control, posture, and vocal quality. Note: Requires additional tutorial fee. Each level may be repeated 3 times for credit.

MP 181 Individual Lessons: Flute
(0.5-1 class hrs/wk, 1-2 cr) F/W/Sp/Su
Individual flute lessons are designed to facilitate the student's general music background and to address their skill level on the flute. Attention is also given to the individual's goals in learning to play the flute and an interest they may have in learning to play particular musical styles. Note: requires additional tutorial fee. Each level may be repeated 3 times for credit.

MP 198 Independent Studies in Performance
(1 class hr/wk, 1 cr) As needed
Students in this course will study performance technique related to both individual and ensemble performance needs and requirements. Students will explore individual vocal technique within a group setting and perform in a variety of performance venues. Students must be enrolled in MP 122, 131, 146, 147, 222, 231 246 or 247 during the term the activity takes place in order to enroll in this course. Instructor approval required.

MP 201 Symphonic Band
(3 class hrs/wk, 1 cr) F/W/Sp
In conjunction with the Oregon State University Department of Music, provides an opportunity for participation in a symphonic band. Note: May require an audition. An unsuccessful audition will result in disenrollment.

MP 202 Concert Band
(3 class hrs/wk, 1 cr) F/W/Sp
In conjunction with the Oregon State University Department of Music, provides an opportunity for participation in a concert band. Note: May require an audition. An unsuccessful audition will result in disenrollment.

MP 203 Marching Band
(3 class hrs/wk, 1 cr) F
Provides opportunity for participation in a marching band in conjunction with the Oregon State University Department of Music. This performance group of more than 160 musicians performs for home football games as well as one trip each year to an off-campus game. Note: May require an audition. An unsuccessful audition will result in disenrollment.

MP 204 Pep Band
(1.5 class hrs/wk, 1 cr) W
Instrumental performing group concentrating on rock, pop and contemporary styles in the small- to medium-size group setting. Provides an opportunity for performance and participation in the OSU Basketball Pep Band in conjunction with the Oregon State University Department of Music. Note: Each class may be taken three times for credit. May require an audition. An unsuccessful audition will require disenrollment.

MP 205 Jazz Band
(2 class hrs/wk, 1 cr) Sp
In conjunction with the Oregon State University Department of Music, provides an opportunity for participation in a jazz band. Note: May require an audition. An unsuccessful audition will result in disenrollment.

MP 222 Concert Choir
(3 class hrs/wk, 2 cr) F/W/Sp
Concert choir is a traditional choral performance class that includes the singing of a wide range of choral music from around the world. Participation in final concert is required. This ensemble is open to all members of the college community. Audition for vocal placement.

MP 231 Chamber Choir
(3 class hrs/wk, 2 cr) F/W/Sp
Chamber choir ("Re-Choired Element") is a performing group that includes the singing and performing of advanced choral literature, including madrigals, motets, jazz arrangements and music theater. Students will develop high-level sight reading and aural skills. Participation in this course may include a number of off-campus performances as well as final concert. Prerequisite: Audition and Instructor Permission. Recommended: Take MP 122 Concert Choir concurrently.

MP 241 Symphony Orchestra
(3 class hrs/wk, 1 cr) F/W/Sp
In conjunction with the Oregon State University Department of Music, provides opportunity for participation in a symphony orchestra. This large ensemble of 65–80 players performs orchestra repertoire from the 18th, 19th and 20th centuries. Note: May require an audition. An unsuccessful audition will result in disenrollment.

MP 242 Chamber Orchestra
(2 class hrs/wk, 1 cr) F/W/Sp
Provides an opportunity for participation in a strings orchestra. The group performs repertoire from the 18th, 19th and 20th centuries.

MP 246 Women's Chorus
(2 class hrs/wk, 1 cr) F/W/Sp
A choral performance ensemble that includes the singing of a variety of choral music from around the world. Participation in final concert is required. Corequisite: Students in the ensemble are strongly encouraged to participate in either MP 122/222 Concert Choir or MP 131/231 Chamber Choir. Consult with the course instructor for vocal placement.

MP 247 Men's Chorus
(2 class hrs/wk, 1 cr) F/W/Sp
Men's Chorus is a choral performance ensemble that includes the singing of a variety of choral music from around the world. Participation in final concert is required. Corequisite: Students in the ensemble are strongly encouraged to participate in either MP 122/222 Concert Choir or MP 131/231 Chamber Choir. Consult with the course director for proper vocal placement.

MP 251 Rehearsal and Performance
(3–20 class hrs/wk, 1–3 cr) As needed
Offers credit for music rehearsal directly related to Performing Arts Department performance. Instructor's approval required.

MP 271 Individual Lessons: Piano
(0.5-1 class hrs/wk, 1-2 cr) F/W/Sp/Su
Individual piano lessons are designed to facilitate the student's general music background and to address their skill level on the piano. Attention is also given to the individual's goals in learning to play the piano and an interest they may have in learning to play particular styles of piano music. Each level may be repeated 3 times for credit. Prerequisite: Instructor's permission.

MP 274 Individual Lessons: Voice
(0.5-1 class hrs/wk, 1-2 cr) F/W/Sp/Su
Provides individual instruction in voice. Student will focus on improving vocal technique in a variety of areas such as pitch matching, breath control, posture, and vocal quality. Note: Requires additional tutorial fee. Each level may be repeated 3 times for credit. Prerequisite: Instructor permission.

MP 281 Individual Lessons: Flute
(0.5-1 class hrs/wk, 1-2 cr) F/W/Sp/Su
Individual flute lessons are designed to facilitate the student's general music background and to address their skill level on the flute. Attention is also given to the individual's goals in learning to play the flute and an interest they may have in learning to play particular musical styles. Note: requires additional tutorial fee. Each level may be repeated 3 times for credit. Prerequisite: Instructor permission.

MS: MILITARY STUDIES

MS 111 Military Science I: Leadership Development
(1 class hr/wk, 1 cr) F
Introduction to ROTC and its relationship to the U.S. Army. Role of the army officer, including leadership and management fundamentals. Types of jobs available to army officers.

MS 112 Military Science I: Military Skills
(1 class hr/wk, 1 cr) W
Basic rifle marksmanship; military first aid; customs and traditions of the U.S. Army; unit organization and missions.

MS 130 Military Physical Conditioning
(3.75 class hr/wk, 1 cr) F/W/Sp
This fitness class is designed to improve your total physical strength and aerobic abilities, prepare you to excel at the Army Physical Fitness Test (APFT) and improve your overall wellbeing. The class is instructed by the Army ROTC Cadre and assisted by Military Science III cadets to better prepare themselves for their leadership course.

MS 113 Military Science I: Land Navigation
(1 class hr/wk, 1 cr) Sp
How to read a topographic map and use a magnetic compass; includes practical exercises.

MS 211 Military Science II: Effective Team Building
(2 class hrs/wk, 2 cr) F
An examination of effective leadership. Development of interpersonal skills using practical exercises and case studies.

MS 212 Military Science II: American Military History
(2 class hrs/wk, 2 cr) W
History of the American soldier from 1775 to 1919; weaponry and tactics of the American Army. Use of battle analysis and wargaming included.

MS 213 Military Science II: Fundamentals of Military Operations
(2 class hrs/wk, 2 cr) Sp
Basic U.S. Army tactics at the individual, team, and squad levels. Integration of military skills in offensive and defensive operations.

MT: MECHATRONICS/INDUSTRIAL MAINTENANCE

MT 3.801 Effective Troubleshooting and Learning
(2 class hrs/wk, 2 cr) F
Learn an effective troubleshooting method that will enable you to successfully troubleshoot technical problems in mechanical, electrical, control, and fluid power systems. This method features a disciplined approach that promotes learning from troubleshooting. Included are strategies for improving your school and workplace learning and customer service for technical troubleshooters.

MT 3.803 Industrial Safety
(2 class hrs/wk, 2 cr) F
Learn how to protect yourself and your fellow workers from workplace accidents. Topics analyzed include, but are not limited to, electrical safety, personal protective equipment, confined space entry, hazardous materials, MSDS and blood borne pathogens. Emphasis is on personal responsibility for your own and others' safety. You will create a personalized safety manual.

MT 3.805 Computerized Maintenance Management
(3 class hrs/wk, 3 cr) Sp
Learn to manage the computerized maintenance management systems (CMMs) used in most modern plants and facilities. Using CMM systems as a troubleshooting tool and as a method for improving plant efficiency is stressed. Boiler operation and maintenance serves as the case study for this course. Prerequisite: MT 3.819 Bearings and Lubrication Systems or instructor's approval.

MT 3.812 Mechanical Systems
(4 class hrs/wk, 3 cr) F
This lab-based course introduces students to fundamental mechanical skills, concepts and practices. Intended for mechatronics technicians, the course includes but is not limited to: precision measurement, shop math, mechanical fasteners, hand and power tools, and fundamentals of rigging and lifting. Safe application of industrial skills in the workplace is emphasized.

MT 3.815 Mechatronics Skills Lab
(3-12 class hrs/wk, 1-6 cr) As needed
Individual lab practice to improve mechatronics skills. May also be used for special projects. To be offered every term subject to instructor approval. Prerequisite: Instructor's approval required.

MT 3.817 Drive Systems
(3 class hrs/wk, 2 cr) F
Learn to troubleshoot and maintain drive systems. Fundamentals of vibration analysis and shaft alignment are covered in the lab. Emphasis is placed on effective maintenance of belt, chain and gear drives for maximum energy efficiency.

MT 3.819 Bearings and Lubrication Systems
(3 class hrs/wk, 2 cr) W
Learn to troubleshoot and maintain bearings and lubrication systems. Fundamentals of vibration and oil analysis, handling and mounting bearings, and operating lubrication systems are included in this training. Energy efficiency is a major focus of this course. Prerequisite: MT 3.812 Mechanical Systems or instructor approval.

MT 3.821 Electrical Systems Troubleshooting
(4 class hrs/wk, 3 cr) F
Learn to use electrical troubleshooting theory in troubleshooting common electrical problems: low voltage, high voltage, unwanted resistance, open circuits, high resistance shorts to ground, and current and voltage unbalance. Efficiency technology and sustainable practices are covered.

MT 3.822 Troubleshooting Motors and Controls
(4 class hrs/wk, 3 cr) W
Learn to troubleshoot and maintain motor control systems, single- and three-phase motors and stepper and servo motors. Analyzing motor control schematics and using advanced digital multimeters are stressed as is motor efficiency. Understanding motor controls is critical to understanding the operation of PLC and all automated control systems. Prerequisite: MT 3.821 Electrical Systems Troubleshooting or instructor's approval.

MT 3.823 Industrial Sensors and Actuators
(4 class hrs/wk, 3 cr) F
Gives students a working knowledge of a variety of industrial sensors and actuators and their operation in control systems. Students will learn how different types of sensors operate and how to select the appropriate sensors. Students will learn to install, maintain and troubleshoot different types of sensors and actuators. Students will construct electrical circuits that illustrate the function of various types of sensors.. Prerequisite: MT 3.834 Principles of Technology II or instructor's approval.

MT 3.824 Programmable Logic Controllers
(4 class hrs/wk, 3 cr) Sp
Programmable logic controls are industrial computers used to control electrical and mechanical systems. This course is a hands-on introduction to Programmable Logic Controllers (PLCs) with emphasis given to effective selection, installation, and troubleshooting of PLC systems. PLC ladder logic programming will be introduced. Field troubleshooting of input and output devices will be covered. Prerequisite: MT 3.822 Troubleshooting Motors and Motor Controls or instructor's approval.

MT 3.825 Process Control and Instrumentation
(4 class hrs/wk, 3 cr) W
Provides an introduction to process control and instrumentation. Students will develop a working production line that includes sensors, pneumatics, PLCs and motor controls. Energy efficiency and maintenance, troubleshooting, and repair of control systems is emphasized. Prerequisite: MT 3.823 Industrial Sensors and Actuators or instructor's approval.

MT 3.826 Advanced PLC Troubleshooting
(4 class hrs/wk, 3 cr) F
Designed to develop advanced skills in programming PLCs. Students will learn to convert common industrial control circuits to PLC ladder logic as well as create programs from narrative description. Special emphasis will be placed on interfacing the PLC with a selection of electro-pneumatic control devices. Also covered are interpreting PLC data sheets and systemic approach to testing and troubleshooting of PLC programs. Prerequisite: MT 3.824 Programmable Logic Controllers or instructor's approval.

MT 3.827 Automated Material Handling
(4 class hrs/wk, 3 cr) Sp
An introduction to automation and production-line technologies. Students will develop a working production line that includes sensor technology, electro-pneumatics, motor control technology, and programmed control. Maintenance, troubleshooting, and repair of manufacturing systems is emphasized as is energy efficiency. Prerequisite: MT 3.824 Programmable Logic Controllers or instructor's approval.

MT 3.830 Industrial Pneumatics Systems
(4 class hrs/wk, 3 cr) W
Learn to analyze fundamental pneumatic schematics, how to troubleshoot common pneumatic problems, how to maintain and repair pneumatic systems used in a variety of production applications, and how to promote energy efficiency in pneumatic systems. Understanding pneumatic circuits is critical to working with all types of industrial control systems. Prerequisite: MTH 3.812 Mechanical Systems or instructor's approval.

MT 3.833 Principles of Technology
(5 class hrs/wk, 4 cr)
Focuses on applying physical concepts and formulae to technology found in the industrial workplace. Students will develop and strengthen critical thinking and problem solving skills required to function and excel in rapidly changing and increasingly complex workplace environments. Lab experiments are intended to reinforce and enhance the scientific principles discussed in class as well as providing an opportunity to learn to work effectively in groups. The impact of technology on energy efficiency in the workplace is studied. Prerequisite: MT 3.812 Mechanical Systems or instructor's approval.

MT 3.834 Principles of Technology II
(5 class hrs/wk, 4 cr) Sp
Focuses on applying physical concepts and formulae to technology found in the industrial workplace. Students will develop and strengthen critical thinking and problem solving skills required to function and excel in rapidly changing and increasingly complex workplace environments. Lab experiments are intended to reinforce and enhance the scientific principles discussed in class as well as providing an opportunity to learn to work effectively in groups. The impact of technology on energy efficiency in the workplace is studied. Prerequisite: MTH 3.833 Principles of Technology or instructor's approval.

MT 3.835 Energy Efficiency & Sustainability
(2 class hrs/wk, 2 cr) Sp
Learn the fundamental concepts and skills related to alternative energy systems including wind, solar, bio-mass, geothermal, tidal, wave, hydro, and small scale nuclear. Included is a study of personal, agricultural, and industrial energy efficiency. Sustainability is studied from an economic and technical perspective.

MT 3.836 Industrial Hydraulics Systems
(4 class hrs/wk, 3 cr) Sp
Learn to analyze fundamental hydraulic schematics, how to troubleshoot common hydraulic problems, and how to maintain and repair hydraulic systems and how to promote energy efficiency in a variety of production applications. You will construct and troubleshoot common hydraulic circuits. Prerequisite: MT 3.822 Troubleshooting Motors and Controls or instructor's approval.

MT 3.844 Industrial Boiler Operation
(2 class hrs/wk, 2 cr) Sp
Learn the operating and safety procedures to successfully operate both low- and high-pressure steam and hot water boilers in industrial plants and commercial buildings. Energy efficiency and biomass burning furnaces are a focus of this course. This is a blended learning course using pod casts, DVDs and field trips. Prerequisite: instructor's approval.

MT 3.846 Pumps and Valves
(3 class hrs/wk, 2 cr) W
Learn to troubleshoot, maintain and repair industrial pumps and valves. Pump and valve selection is stressed as is print reading and correct installation. Emphasizes internet practical skills that lead to the efficient operation of valve and pumping systems. Prerequisite: MT 3.812 Mechanical Systems or instructor's approval.

MT 3.847 HVAC System Controls
(2 class hrs/wk, 2 cr)
This is an internet, hybrid course that will introduce the student to HVAC ducting systems and digital (DDC) controls. Students will learn about using the DDC system as an aid in troubleshooting and promoting energy efficiency, and indoor air quality. Prerequisite: MT 3.855 Refrigeration Troubleshooting or instructor's approval.

MT 3.848 EPA Technician Certification
(2 class hr/wk, 2 cr)
Anyone handling and refrigerants or working on refrigeration systems must have EPA certification or face large fines and legal proceedings. Students will sit for an EPA certification from the ESCO HVAC Excellence program. The student will study from a test prep booklet, optional texts, and a podcast of the class lectures then arrange the test date with the instructor sometime during the term. Completing 410A certification is an additional option for this class. Prerequisite: MT 3.855 Refrigeration Troubleshooting or instructor's approval.

MT 3.849 Heating Systems
(3 class hrs/wk, 2 cr)
Skills learned include the operation and servicing of oil and gas heating systems. All relevant safety and energy efficiency concerns are covered.

MT 3.850 Electrical Schematics Analysis
(2 class hrs/wk, 2 cr)
Skills learned include the analysis of electrical schematics: building plans, ladder diagrams, PLC diagrams, and electrical system manuals. This course is a hybrid course combining internet, podcasts, text and work book activities, and intensive hands-on seminars. Prerequisite: MT 3.855 Refrigeration Troubleshooting or instructor's approval.

MT 3.852 Refrigeration Brazing
(2 class hrs/wk, 1 cr)
Skills learned include: cutting and brazing safety, bend, cut, flare, and swag refrigerant tubing, and RHVAC silver soldering. Earn Oregon State Refrigeration Brazing Certification. Introduction to refrigeration systems as related to troubleshooting. This training requires 15–20 hours of hands-on practice or passing a challenge test. Prerequisite: Instructor's approval

MT 3.853 Ammonia Plant Operator
(2 class hrs/wk, 2 cr) Sp
Prepares you to begin work as an ammonia plant operator. The course focuses on the skills and knowledge to operate such plants safely and efficiently. No ammonia plant experience is required, but previous knowledge of general refrigeration system operation is required. Formal certification is managed through the Refrigerating Engineers and Technicians Association. Prerequisite: MT 3.855 Refrigeration Troubleshooting or instructor's approval.

MT 3.854 Refrigeration Servicing
(2 class hrs/wk, 2 cr)
Skills learned include: take pressures, identify refrigerants, recover and recycle refrigerant, evacuate and charge refrigeration systems. All applicable safety precautions and EPA governed environmental regulations. This is a hybrid course that includes podcast and on-line activities combined with focused seminar activities that feature intensive, hands-on practice of these essential skills. Energy efficiency is stressed in this course. Prerequisite: Instructor's approval.

MT 3.855 Refrigeration Troubleshooting
(2 class hrs/wk, 2 cr)
Skills learned include: troubleshoot and repair refrigeration systems; evaluate system operation; check superheat and subcooling; test compressors, evaporators, condensers, and expansion devices; troubleshoot hot and cold calls; and servicing for energy efficiency. This is a hybrid course that includes podcast and on-line activities combined with focused seminar activities that feature intensive, hands-on practice of these essential skills. Prerequisite: MT 3.854 Refrigeration Servicing or instructor's approval.

MT 3.897 Capstone Project I
(3 class hrs/wk, 2 cr) F
Begins the creation of operating and maintenance routines for a working, fully automated production system. Troubleshoot systems faults and devise a plan for optimizing system operation. Requires substantial research activity and lab time. Job search activities are covered during this course. Prerequisite: MT 3.834 Principles of Technology I or instructor's approval.

MT 3.898 Capstone Project II
(3 class hrs/wk, 2 cr) W
Students create operating and maintenance routines for a working, fully automated production system. Troubleshoot systems faults and devise a plan for optimizing system operation. Requires substantial research activity and lab time. Prerequisite: CM 3.897 Capstone Project I or instructor's approval.

MT 3.899 Capstone Project and Assessment
(3 class hrs/wk, 2 cr) Sp
Complete the creation of operating and maintenance routines for a working, fully automated production system using skills learned in previous mechatronics coursework. Troubleshoot systems faults and devise a plan for optimizing system operation. Requires substantial research activity and lab time. Prerequisite: MT 3.898 Capstone Project II or instructor's approval.

MTH: MATHEMATICS

Eligibility to enroll in math courses is based on demonstrated skill level through completing the appropriate prerequisite with a "C" grade or higher or achieving an appropriate test score on the Computerized Placement Test (CPT). Many math courses require a calculator. Please see your instructor to determine the type of calculator that is appropriate

MTH 020 Basic Mathematics
(4 class hrs/wk, 4 cr) F/W/Sp/Su
Provides a thorough review of arithmetic, including fundamental operations with whole numbers, fractions, decimals, percentages, geometry and measurement. Provides a basis for MTH 060 Introduction to Algebra. Note: A minimum competency level is required to pass this course.

MTH 060 Introduction to Algebra
(4 class hrs/wk, 4 cr) F/W/Sp/Su
A first course in algebra for students who have no previous algebra experience or who need a thorough review. Assumes no familiarity with algebra. Introduces basic operations with integers, exponents, algebraic expressions, linear equations, graphing, dimensional analysis, scientific notation, ratio and proportion, realistic percent problems and other problems that lend themselves to one-variable solutions and introduces statistics, including bar graphs, mean, median, mode and range. Problem solving is emphasized throughout the course. Application problems are realistic, with some data to be collected, analyzed and discussed in a group setting with results submitted in written form. Note: A minimum competency level is required to pass this course. Prerequisite: MTH 020 Basic Mathematics or equivalent.

MTH 061 Survey of Mathematical Fundamentals
●*(3 class hrs/wk, 3 cr) W/Sp*
Survey course for the Associate of Applied Science degree. Includes applications of basic algebra, ratio and proportion, charts, tables, graphs, data analysis and problem solving, and provides an introduction to practical geometry and trigonometry. Emphasis is on applications. Application problems are realistic with some data to be collected, analyzed and discussed in a group setting with results submitted in written form. A minimum competency level is required to pass this course. Prerequisite: MTH 060 Introduction to Algebra or equivalent.

MTH 063 Industrial Shop Math
●*(1 class hr/wk, 1 cr) W/Sp*
Acquaints students with measuring tools in the industrial shop and the types of computations and problem-solving methods frequently needed in industrial settings. Note: A minimum competency level is required to pass this course. Prerequisite: MTH 061 Survey of Mathematical Fundamentals or instructor's approval.

MTH 065 Elementary Algebra
●*(4 class hrs/wk, 4 cr) F/W/Sp/Su*
A nontraditional algebra course that incorporates some geometry, statistics and trigonometry. Designed for the student who is familiar with beginning algebra concepts (see MTH 060). Topics include graphing linear, quadratic and exponential functions; solving linear and quadratic equations; solving application problems; using linear and other mathematical models. Problem solving is emphasized throughout the course. Application problems are realistic, with some data to be collected, analyzed and discussed in a group setting with results submitted in written form. A minimum competency level is required to pass this course. Note: Students use graphing calculators in this course. Prerequisite: MTH 060 Introduction to Algebra or equivalent. Recommended: Completion of RD 080 or equivalent, or co-enrollment with RD 090.

MTH 095 Intermediate Algebra
●*(4 class hrs/wk, 4 cr) F/W/Sp/Su*
Designed for the student who is familiar with elementary algebra, as well as basic geometry and statistics (see MTH 065). Topics include graphing quadratic and other functions; multiplying and factoring polynomials; performing operations with rational expressions; solving systems of linear equations; solving quadratic equations by factoring; performing arithmetic with complex numbers; developing and applying mathematical models. Problem solving is emphasized throughout the course. Application problems are realistic, with some data to be collected, analyzed and discussed in a group setting with results submitted in written form. Note: Students use graphing calculators in this course. Prerequisite: MTH 065 Elementary Algebra or equivalent.

MTH 097 Practical Geometry
●*(4 class hrs/wk, 4 cr) F/W*
Presents applied, informal geometry for students who did not take geometry in high school or who need a thorough review. Includes problem solving, geometric shapes, angle measure, perimeter, area and volume, congruence and similarity, circles, basic constructions and an introduction to right triangle trigonometry. Prerequisite: MTH 095 Intermediate Algebra or equivalent.

MTH 105 Introduction to Contemporary Mathematics
●*(4 class hrs/wk, 4 cr) W/Sp*
A survey course in mathematics for students in the liberal arts and other non-science majors. Topics are selected from areas such as management science, statistics, social choice, the geometry of size and shape, and computers and their applications. Emphasizes the application of mathematics to the problems of contemporary society and the critical role these applications play in economic, political and personal life. Prerequisites: MTH 095 Intermediate Algebra or equivalent.

MTH 111 College Algebra
●*(5 class hrs/wk, 5 cr) F/W/Sp/Su*
Explores relations and linear, quadratic, exponential, polynomial, rational and logarithmic functions. Includes theory of equations, matrices and determinants. Prerequisites: MTH 095 Intermediate Algebra or equivalent.

MTH 112 Trigonometry
●*(5 class hrs/wk, 5 cr) F/W/Sp/Su*
Introduces trigonometric functions, trigonometric identities, inverse trigonometric functions, trigonometric equations, right triangle trigonometry, complex numbers and polar coordinates. Includes vectors and conic sections. Prerequisites: MTH 111 College Algebra and MTH 097 Practical Geometry or equivalent.

MTH 199 Mathematics: Special Studies
●*(1–3 class hrs/wk, 1–3 cr) As needed*
Allows the student to investigate, with supervision from a faculty member, a topic of his or her interest at an individualized pace. Credits and projects will be determined jointly by the instructor and the student.

MTH 211 Fundamentals of Elementary Mathematics I
●*(4 class hrs/wk, 4 cr) F/W*
One of three courses in the mathematics cluster for prospective elementary and middle school teachers. Develops the understanding of basic mathematical concepts necessary for teaching mathematics in grades K–8. Topics include problem solving, whole numbers, algorithms for computation, numeration systems, number theory and fractions. Prerequisite: MTH 095 Intermediate Algebra or equivalent.

MTH 212 Fundamentals of Elementary Mathematics II
●*(4 class hrs/wk, 4 credits) W*
One of three courses in the mathematics cluster for prospective elementary and middle school teachers. Develops the understanding of basic mathematical concepts necessary for teaching mathematics in grades K–8. Topics include decimals, percent, ratio and proportion, integers, real numbers, basic statistics and probability. Prerequisite: MTH 211 Fundamentals of Elementary Mathematics I.

MTH 213 Fundamentals of Elementary Mathematics III
●*(4 class hrs/wk, 4 credits) Sp*
One of three courses in the mathematics cluster for prospective elementary and middle school teachers. Develops the understanding of basic mathematical concepts necessary for teaching mathematics in grades K–8. Covers basic geometry topics including shapes and their properties; symmetry; angle measure; measurement of length, area and volume; congruence and similarity; Pythagorean Theorem; and coordinate geometry. Prerequisite: MTH 095 Intermediate Algebra and MTH 097 Practical Geometry or equivalent.

MTH 231 Elements of Discrete Mathematics
●*(4 class hrs/wk, 4 cr) W*
The first course in discrete mathematics for mathematics and computer science majors. Topics include elementary logic, mathematical proof, mathematical induction, functions and sequences, basic set theory, matrix algebra, relations and Boolean algebras. Prerequisite: MTH 112 Trigonometry or equivalent. MTH 251 Differential Calculus recommended.

MTH 232 Elements of Discrete Mathematics
●*(4 class hrs/wk, 4 cr) Sp*
The second course in discrete mathematics for mathematics and computer science majors. Topics include basic matrix linear algebra, combinatorics, graph theory and algorithms. Prerequisite: MTH 231 Elements of Discrete Mathematics.

MTH 241 Calculus for Biological/Management/Social Sciences
●*(4 class hrs/wk, 4 cr) F/W/Sp*
Introduces calculus as applied to business, the social sciences and life sciences. It uses an intuitive development of the calculus of polynomial, exponential and logarithmic functions, extrema theory and applications. Prerequisite: MTH 111 College Algebra.

MTH 243 Introduction to Statistics
●*(4 class hrs/wk, 4 cr) F/Sp*
An introductory statistics course emphasizing interpretation of statistical results. The course focuses on sampling procedures, experimental design, descriptive statistics, and inferential statistical techniques to analyze survey and experimental data from a wide range of fields including health care, biology, psychology, physics and agriculture. Includes basic concepts in graphical interpretation of one and two variable data, probability, probability distributions (binomial, normal, t-Distribution, and chi-square), confidence intervals for means and proportions, and hypothesis testing. Prerequisite: MTH 111 College Algebra or equivalent.

MTH 245 Math for Biological/Management/Social Sciences
●*(4 class hrs/wk, 4 cr) F/W/Sp*
A survey course of discrete mathematics for non-physical science majors. Topics include systems of inequalities, linear programming, probability and probability distributions, and an introduction to descriptive statistics. This course emphasizes the use of computer spreadsheets to solve problems. Prerequisite: MTH 111 College Algebra, or equivalent.

MTH 251 Differential Calculus
●*(5 class hrs/wk, 5 cr) F/W/Sp/Su*
The first course in the calculus sequence for students majoring in mathematics, science and engineering. Limits and derivatives are approached using graphical, numeric and symbolic methods. Linear approximations, related rates, curve sketching and optimization are among the applications of differentiation covered in this course. Prerequisite: MTH 112 Trigonometry or equivalent.

MTH 252 Integral Calculus
●*(5 class hrs/wk, 5 cr) F/W/Sp/Su*
The second course in the calculus sequence for students majoring in mathematics, science and engineering. Topics include techniques of integration, numerical integration, improper integrals, applications of integration, and an introduction to differential equations. Prerequisite: MTH 251 Differential Calculus.

MTH 253 Calculus
●*(4 class hrs/wk, 4 cr) F/W/Sp*
The third course in the calculus sequence for students majoring in mathematics, science and engineering. Topics include sequences and series of real and complex functions, matrix algebra, linear dependence and independence, eigenvalues and eigenvectors. Prerequisite: MTH 252 Integral Calculus.

MTH 254 Calculus
●*(4 class hrs/wk, 4 cr) F/W*
The fourth course in the calculus sequence for students majoring in mathematics, science and engineering. Topics include vectors in 2- and 3-space, graphs and equations of multivariable functions and partial derivatives, directional derivatives, optimization of surfaces, cylindrical and spherical coordinates and multiple integrals and their applications. Prerequisite: MTH 252 Integral Calculus.

MTH 255 Vector Calculus
●*(4 class hrs/wk, 4 cr) W*
An intermediate treatment of multivariate calculus with a vector approach. Provides the mathematical skills for courses in advanced calculus, fluid mechanics and electromagnetic theory. Prerequisite: MTH 254 Calculus.

MTH 256 Applied Differential Equations
●*(4 class hrs/wk, 4 cr) Sp*
Beginning course in differential equations for students majoring in mathematics, sciences or engineering. Covers ordinary differential equations, applications, systems of first order differential equations, and Laplace transforms. Prerequisite: MTH 254 Calculus or instructor's approval.

MTH 265 Statistics for Scientists and Engineers
●*(4 class hrs/wk, 4 cr) W*
Covers probability and inferential statistics applied to scientific and engineering problems. Includes random variables, expectation, sampling, estimation, hypothesis testing, regression, correlation and analysis of variance. Prerequisite: MTH 252 Integral Calculus.

MTH 280 CWE Mathematics
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Designed to give students practical experience in supervised employment related to mathematics. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

MTH 299 Mathematics: Special Studies
(1–3 class hrs/wk, 1–3 cr) As needed
Allows the student to investigate, with supervision from a faculty member, a topic of his or her interest at an individualized pace. Credits and projects will be determined jointly by the instructor and the student.

MUS: MUSIC

MUS 101 Music Fundamentals
➢*(3 class hrs/wk, 3 cr) F/W/Sp*
Introduction to the basics of music reading and writing from the very beginning. Studies basic music theory, scales, chord recognition, music analysis, interval relationships, and an introduction to composing one's own music.

MUS 105 Introduction to Rock Music
➢*(3 class hrs/wk, 3 cr) Sp*
Examines the relationship between rock music and society. Emphasizes the music and lyrical significance of rock music as contemporary social commentary.

MUS 108 Music Cultures of the World
(3 class hrs/wk, 3 cr) F
Survey of the world's music with attention to musical styles and cultural contexts. Included are the musical and cultural histories of Oceania, Indonesia, Africa, Asia, and Latin America.

MUS 111 Music Theory I
(3 class hrs/wk, 3 cr) Sp
Covers basic structure of music (tonality, modality, melody, harmony, rhythm, modulation and phrase structure) as it is exhibited through diatonic harmony. Prerequisite: Grade of C or higher in MUS 101 Music Fundamentals.

MUS 161 Music Appreciation
➢*(3 class hrs/wk, 3 cr) F/W/Sp*
Studies music through the elements or language of music, musical forms and the history of music.

MUS 199 Explorations in Music Abroad
(6–36 class hrs/wk, 1-6 cr) As needed
Students will study the history and development of Western Music through hands-on activities and travel to several countries in Europe. Students will engage in lessons about the societies and music history of the cultures that they will be visiting through class lectures prior to traveling abroad and upon their return. In addition, students will complete a final project based on their travel experience. Students must obtain a passport and meet all deadlines required for this course.

MUS 205 Introduction to Jazz
➢*(3 class hrs/wk, 3 cr) As needed*
Provides a listener's approach to the development of jazz through its various styles and its place in Afro-American and 20th century socio-political history. For the non-music major. Recommended: College-level reading and writing skills.

MUS 280 CWE Music
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
An instructional program designed to give students practical experience in supervised employment related to music. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. CWE coordinator's approval required.

NFM: NUTRITION AND FOOD MANAGEMENT

NFM 225 Nutrition
(4 class hrs/wk, 4 cr) F/W/Sp
Introduces nutrients: their functions, sources, effects of deficiency, and toxicity. Examines current recommendations for Americans and topics of current interest. Includes digestion, metabolism and changing nutrient needs through the life cycle. Provides opportunity to evaluate personal dietary intake for three days. Strongly recommended: College Chemistry, a strong background in chemistry, or BI 112 Cell Biology for Health Occupations. College-level reading and writing and MTH 065 are strongly recommended for success in this course.

NU: NURSING ASSISTANT

NU 5.406 Nursing Assistant
(150 hrs, 9 cr) F/W/Sp/Su
Fulfills the Oregon State Board of Nursing requirement. (75 hours of classroom/skills laboratory instruction and 75 hours of clinical experience)

This course includes instruction in basic nursing skills, restorative care, personal care, social and mental health needs, and patient rights. Students will learn to care for residents in a long-term care and hospital environment under the direct care of a licensed nurse. This is a 150-hour course and meets the Oregon State Board of Nursing (OSBN) requirement for Nursing Assistant training with 75 hours of classroom/lab instruction and 75 hours of clinical instruction. After completing the course students earn nine LBCC credits and a certificate of completion. Student's must comply with all course policies and procedures regarding attendance, behavioral expectations, clinical policies, course requirements, criminal background checks, dress code, drug testing, exam administration and grading. Students must be in 100 percent attendance and on time to all scheduled classes, labs and clinicals. Students will not receive a certificate of completion until all 150 mandatory hours are met.

This course prepares students to take the written and skills portion of the Oregon Nursing Assistant Competency Exam (ONACE) to be certified by OSBN. Pursuant to ORS 678.150, the Oregon State Board of Nursing (OSBN) now requires, for licensure or certification, applications to provide fingerprints in order for the Board to conduct a national criminal history record check. Prerequisite: A high school diploma or GED is recommended. All students must be able to turn and lift patients, hear and see patients in need, communicate with patients, families and co-workers, take action in stressful situations, and read and keep medical records. Prerequisite: CPT reading test score into RD 090 or have passed RD 080 with a grade of "C" or better. Show proof of negative TB test within the past 12 months as well as other site-specific immunizations. Complete a criminal history check and be deemed "qualified" by Oregon State Board of Nursing. Cooperate with the drug testing policies of any non-LBCC clinical teaching site as a condition for continued enrollment in the course.

NUR: NURSING

NUR 101 Nursing I
(15 class hrs/wk, 8 cr) F
NUR 101 is the first course in the nursing sequence. In this course, beginning nursing students learn core concepts required for professional nursing including; provider of care, teacher, communicator, and critical thinking in the context of a health care setting. Fundamental concepts of the health-illness continuum, nursing process, basic care and comfort, and patient care management are explored. Clinical applications focus on assessing the patient and developing a database, as well as beginning to plan, implement, and evaluate a plan of care for patients while respecting the beliefs of individuals, considering variations in concepts of health and illness, and allowing for differences in communication needs. Other content includes the pathophysiology, nursing assessment, nursing implications, and related pharmacology for patients experiencing changes in functional status, infection, basic psychosocial and/or mental health needs. Simulated practice of fundamental nursing care is included. Clinical application of both theory and skills occurs in a hospital and community settings. Prerequisites: WR121 English Composition, MTH 095 Intermediate Algebra, BI 231 Anatomy and Physiology, BI 232 Anatomy and Physiology, BI 233 Anatomy and Physiology, and admission to the Nursing program.

NUR 102 Nursing II
(15 class hrs/wk, 8 cr) W
NUR 102 is the second course offered in the core nursing sequence of classes. Students continue to learn core concepts required for professional nursing including; provider of care, teacher, communicator, and critical thinking in the context of a health care setting. The initial focus of this course surrounds topics related to nursing care of the acute care patient experiencing physical and psychological changes related to healing and general surgical procedures. Additional concepts of nursing care include the care of patients with respiratory disorders, musculoskeletal disorders, metabolic disorders, digestive, and intestinal disorders. Care of the hospitalized child is also integrated into the aforementioned concepts. Clinical application of both theory and skills occurs in the hospital and community settings. Simulated practice in a multimedia setting is an element of the clinical practicum. Prerequisites: NUR 101 (Nursing I), NUR 268A (Drug Therapy)

NUR 103 Nursing III
(15.5 class hrs/wk, 8 cr) Sp
NUR 103 is the third course in the nursing sequence. This course focuses on concepts regarding patients who are experiencing physical and psychological changes as they relate to childbearing, geriatrics, and patients with chronic illness. Content includes exploration of pathophysiology, collaborative management, and related pharmacology. The nursing roles of provider of care, teacher, and member of a profession are explored in meeting the needs of patients in the acute care setting. Clinical application of both theory and skills occurs in the hospital setting. Simulated practice in a multimedia setting is an element of the clinical practicum. Prerequisites: NUR 101, NUR 102 (Nursing I and II), NUR 268A, NUR 268B (Drug Therapy A and B)

NUR 201 Nursing IV
(16 class hrs/wk, 8 cr) F
NUR 201 is the fourth course in the nursing sequence. This course focuses on comprehensive nursing interventions to promote positive outcomes in patients with acute health and chronic illness issues. Content includes pathophysiology, nursing assessment, nursing implications of related diagnostic tests, and pharmacology for patients with fluid management issues, mental health disorders, acute perinatal and reproductive issues, and a continuing focus on chronic illnesses. Students will utilize the nursing process to promote positive outcomes in patients experiencing complex physiologic and psychosocial alterations. Emphasis is placed on the roles of the nurse as care giver, communicator, teacher, and critical thinker. Clinical application of both theory and skills occurs in the hospital setting. Simulated practice in a multimedia setting is an element of the clinical practicum. Prerequisites: NUR 101, 102, 103 (Nursing I, II, III); NUR 268A, 268B, and 268C (Drug Therapy), or completion of all advanced placement requirements.

NUR 202 Nursing V
(16 class hrs/wk, 8 cr) W
NUR 202 is the fifth course in the nursing sequence. The focus is on comprehensive nursing interventions to promote positive patient responses to health and illness issues. Critical thinking will be promoted by assisting the student to interrelate pathophysiology, nursing assessment, nursing implications of related diagnostic tests, and pharmacology for patients with renal disorders, gastrointestinal disorders, high-risk obstetrics, burns, acute complex respiratory disorders, neurological trauma, shock, trauma, and multisystem disorders. Students will utilize the nursing process to promote positive outcomes in patients experiencing complex physiologic and psychosocial alterations in those body systems. Emphasis is on critical thinking and the nursing process as they relate to patient care in the hospital setting. Clinical application of both theory and skills occurs in the hospital setting. Simulated practice in a multimedia setting is an element of the clinical practicum. Prerequisites: NUR 101, 102, 103, and 201 (Nursing I, II, II, and IV); NUR 268A, 268B, 268C (Drug Therapy A, B, and C), and WR 123 English Composition: Research.

NUR 203 Nursing VI
(18 class hrs/wk, 6 cr) Sp
NUR 203 is the final and sixth course in the core nursing sequence. The focus of this course is on complex and comprehensive patient care. Supervisory skills and case management proficiencies are applied to small groups of hospitalized or community based patients. A registered nurse preceptor oversees the clinical care given by the student. This nurse directly supervises the student under the guidance of the nursing faculty liaison within the scope of practice of the entry-level nurse. The student will practice leadership, manage patient assignments, and collaborate with health team members from a variety of backgrounds. Clinical application of theory and skills occurs in the acute,sub-acute and community-based settings. Prerequisites: NUR 101, 102, 103, NUR 201 and 202 (Nursing I, II, III, IV and V); NUR 268A,NUR 268B, NUR 268C (Drug Therapy and Nursing Implications), and WR 123, or completion of all advanced placement requirements.

NUR 222 Professional Practice Issues
(2 class hr/wk, 2 cr) Sp
Introduces and discusses ethical, legal and professional responsibilities in relation to employment, licensure, professional organizations and changing trends in health care. Includes job search skills. Prerequisites: NUR 101, NUR 102, NUR103, NUR 201, NUR, 202, Corequisite: NUR 203

NUR 268A Drug Therapy and Nursing Implications
(1 class hr/wk, 1 cr) F
This one-credit course focuses on nursing management and critical thinking regarding medication therapy. Introductory topics are pharmacokinetics, drug interactions and nursing implications. These topics are then applied to the following drug groups: analgesics, opiates, nonopioids, NSAIDs, aspirin, drugs for bone disorders, joint disorders, adrenergics, cholinergics, sedatives, hypnotics, and infectious disease agents. Drug lists for each major category of drugs will be used to direct learning for drug action, safe dosage, side effects, drug interactions, adverse reactions, and nursing implications. Prerequisites: Admission in the Nursing program and enrollment in NUR 101 Nursing I.

NUR 268B Drug Therapy and Nursing Implications
(1 class hr/wk, 1 cr) W
This one-credit course builds on the knowledge acquired in NUR 268A and continues to focus on nursing management and critical thinking with regard to medication therapy. Topics included in this unit of study are pharmacokinetics, pharmacodynamics, interactions of the drug groups used in the treatment of disorders found in the following body systems: respiratory, endocrine, gastrointestinal, body fluids and electrolytes. This course will also address drugs that are used specific to the following disorders: angina, heart failure, hypertension, diabetes, birth control, and impotence. Drug lists for each major category of drugs will be used to direct learning for drug action, safe dosage, side effects, drug interactions, adverse reactions and nursing implications. Prerequisites: NUR 268A (Drug Therapy and Nursing Implications) and enrollment in NUR 102 Nursing II.

NUR 268C Drug Therapy and Nursing Implications
(1 class hr/wk, 1 cr) Sp
This one-credit course focuses on nursing management and critical thinking pertaining to medication therapy as well as drug therapy related to pediatric patients. Drug classifications and prototype drugs will be studied. Topics will focus on therapeutic uses, drug actions, adverse reactions, drug interactions, and nursing implications for the following drug groups: anti-dysrhythmics, anticancer, anticoagulants, immunosuppressants, neurogenerative/neurologic, psychotherapeutic, women's health, anti-seizure drugs, anti-anginals, lipid-lowering, antiplatelet, antithrombolytic drugs, and antimicrobials specific to the GU system. Prerequisites: NUR 268A and NUR 268B (Drug Therapy and Nursing Implications) and enrollment in NUR103 Nursing III.

NUR 280S Service-Learning Nursing
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
This instructional program uses contextual learning to promote critical thinking, citizenship and civic responsibility as students work with community partners in addressing real community needs. Students identify learning objectives, work a specified number of hours during the term, and engage in faculty-led guided reflection activities. Prerequisites: Students must have taken or must be currently taking appropriate course or courses in their major field of study. They must also have their service-learning approved by the appropriate faculty coordinator.

OA: BUSINESS TECHNOLOGY

OA 104 Business Math
(3–4 class hrs/wk, 1–2 cr) F/W/Sp/Su
Reviews basic math concepts and utilizes mathematical operations to solve practical business application problems. Prerequisite: MTH 020 Basic Mathematics or placement test score.

OA 109 Job Success Skills
(1 class hr/wk, 1 cr) Sp
Learn to effectively communicate employability skills to prospective employers. Topics include employability skills, job research techniques, resume writing, job applications, employment tests, cover letters, mock interviews, and professional dress and grooming.

OA 110 Editing Skills for Information Processing
(3 class hrs/wk, 3 cr) F/W/Sp
Reviews basic grammar fundamentals with an emphasis on proofreading and editing skills. Prerequisite: WR 090 The Write Course or writing CPT score of 40 or higher, and RD 090 Strategies for Effective Reading.

OA 116 Administrative Procedures
(6 class hrs/wk 4cr) Sp
Students will incorporate general office procedures, team-building activities, and ethical decision-making processes needed in a diverse, modern office environment. Prerequisites: OA 120 Information Technology for Administrative Professionals; OA 110 Editing Skills for Information Processing with a minimum of a "C" grade; OA 201 Word Processing for Business: WordPerfect or OA 202 Word Processing for Business: MS Word.

OA 120 Information Technology for Administrative Professionals
(4 class hrs/wk 3 cr) F/W
Students will examine the integration of systems and technology used in current business processes. Procedures related to the use of hardware and system software will be examined. The basics of operating systems and file management will be explored. Spreadsheet and database application software will be used to create and edit business documents and analyze information.

OA 125 Document Processing & Formatting
(3 class hrs/wk, 3 cr) F/W/Sp/Su
Student will create and correctly format business documents including memos, letters, tables, and reports using word processing software. Student will also diagnose and correct keying deficiencies through prescribed drills leading to improved speed and accuracy while keying by touch. Student will input by touch 10-key and top-row numeric data from a variety of source documents. Workstation health and safety will be emphasized. Prerequisite: Ability to type accurately by touch at 25 wpm minimum.

OA 131O Windows and Computer Fundamentals
(3 class hrs/wk, 1 cr)
Examines the integration of systems and technology. Provides an introduction to the Windows operating system. Procedures related to the basics of operating systems and file management will be examined. Covers basic concepts for using menus, dialog boxes, and the help system; and Internet and email. Discusses ways to customize the Windows environment and describes a few "built-in" accessories.

OA 131P PowerPoint Fundamentals
(3 class hrs/wk, 1 cr)
Learn to make effective electronic slide show presentations using presentations software. Emphasis is placed on designing attractive and effective PowerPoint slide shows using tools available through MS PowerPoint program. Prerequisite: Working knowledge of computer operating system and file management or OA 131O Windows and Computer Fundamentals.

OA 131S Excel Fundamentals
(3 class hrs/wk, 1 cr)
Introduces spreadsheet software and how it is utilized in business and personal applications. Covers basic worksheet concepts such as formatting, formulas, and charts. Prerequisite: Working knowledge of computer operating system and file management or OA 131O Windows and Computer Fundamentals, MTH 020 Basic Mathematics .

OA 201 Word Processing for Business: WordPerfect
(5 class hrs/wk, 1–3 cr) F/W/Sp/Su
Use a variety of WordPerfect features to produce, format, edit and enhance business documents. Required: touch typing at 25 wpm minimum. Corequisite: OA 131O Windows & Computer Fundamentals or OA 120 Information Technology for Administrative Professionals or equivalent.

OA 202 Word Processing for Business: MS Word
(5 class hrs/wk, 1–3 credits) F/W/Sp/Su
Use a variety of MS Word features to produce, format, edit and enhance business documents. Required: touch typing at 25 wpm minimum. Corequisite: OA 131O Windows & Computer Fundamentals or OA 120 Information Technology for Administrative Professionals or equivalent.

OA 203 Advanced Word Processing
(5 class hrs/wk, 3 cr) F/Sp
Explore and master advanced functions of popular word processing packages by applying concepts and software functionality to job-related projects. Prerequisite: OA 201 Word Processing for Business: WordPerfect or OA 202 Word Processing for Business: MS Word.

OA 204L Legal Administrative Project Management
(6 class hrs/wk, 4 cr) W
Students will participate in dynamic legal business simulations, using a variety of traditional legal office procedures, communication processes, and team skills. Prerequisite: OA 116 Administrative Procedures or instructor's approval.

OA 205 Desktop Publishing
(4 class hrs/wk, 3 cr) W
Explore and master basic functions of popular Web designing and publishing software packages by applying concepts and software functionality to job-related projects. Design and create attractive, effective materials for today's business needs such as letterheads, flyers, newsletters, advertisements, brochures, online publications and Web pages. Required OA 131O Windows and Computer Fundamentals or equivalent knowledge.

OA 210 Integrated Software Applications
(4 class hrs/wk, 4 cr) Sp
Examines procedures related to the integration of functions between various MS Office software, office information and decision support systems. Utilize communication and thinking skills in using resources, working with information and understanding systems and technology. Prerequisites: OA 120 Information Technology for Administrative Professionals; OA 131P PowerPoint Fundamentals; and OA 202 Word Processing for Business: MS Word.

OA 215 Communications in Business
(5 class hrs/wk, 4 cr) F/Sp
Effectively communicate in both oral and written forms in a variety of business situations and work collaboratively in teams to problem solve challenging communication issues. Prerequisite: OA 110 Editing Skills for Information Processing with a minimum of a "C" grade; and OA 125 Document Processing and Formatting. Corequisite: OA 201 Word Processing for Business: WordPerfect or OA 202 Word Processing for Business: MS Word.

OA 225 Applied Document Processing
(5 class hrs/wk, 3 cr) F/W/Sp/Su
Learn to apply editing, word processing, formatting and transcribing skills to produce a variety of business documents. Prerequisites: OA 110 Editing Skills for Information Processing with a minimum of a "C" grade, OA 125 Document Processing & Formatting, and OA 201 Word Processing for Business: WordPerfect or OA 202 Word Processing for Business: MS Word.

OA 241 Computerized Records Management
(5 class hrs/wk, 3 cr) W
Perform manual filing using ARMA simplified filing rules and electronic filing using MS Access database and develop fundamentals of managing the records life cycle. Corequisites: OA 201 Word Processing for Business: WordPerfect or OA 202 Word Processing for Business: MS Word.

OA 251 Management for the Office Professional
(3 class hrs/wk, 3 cr) F
Student will discover and refine administrative office management skills needed by present and future office professionals. Prerequisite: OA 116 Administrative Procedures.

OA 270 Preparation for IAAP Certifying Exam
(1 class hr/wk, 1 cr) F/W/Sp
Student will review theoretical and technical skills needed to successfully pass the national exams administered by the International Association of Administrative Professionals and take skills tests sponsored by the Office Professional Assessment and Certification organization. Prerequisite: Near completion of two-year Administrative Office Professional Program.

OA 271 Advanced Business Projects
(6 class hrs/wk, 4 cr) W
Students will participate in dynamic business simulations, using a variety of traditional office procedures, communication processes, and team skills. Prerequisite: OA 116 Administrative Procedures or instructor's approval.

OA 280 CWE (Cooperative Work Experience) for Office Professionals
(6–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
Student will obtain relevant employment opportunity in chosen field of study to develop and refine a broad range of employability skills. Thirty hours of work equals one college credit. Prerequisite: GPA of 2.0 and approval of supervising faculty.

OA 2.500 Business Orientation
(1 class hr/wk, 1 cr) F
Student will learn about resources and facilities at LBCC, practice strategic workplace "soft" skills, and gain additional career information in chosen field of study.

OA 2.505 Voice Recognition
(5 class hrs/wk, 2 cr) W/Sp
Student will use speech recognition software and voice commands as tools to control computer operations and create professional documents. Prerequisite: OA 131O Windows & Computer Fundamentals or equivalent.

OA 2.515M Business Math: Medical I
(2 class hrs/wk, 1 cr) F/W/Sp
Review and apply basic math skills as used in health care settings. Five-week class. Prerequisite: MTH 020 Basic Mathematics or placement test score.

OA 2.515MA Business Math: Medical II
(2 class hrs/wk, 1 cr) F/W/Sp
Learn medical application of basic math skills for advanced clinical procedures. Five-week class. Prerequisite: OA 2.515M Business Math Medical I and MTH 060 Introduction to Algebra.

OA 2.524 Medical Transcription I
(5 class hrs/wk, 1–3 cr) F/W/Sp/Su
Student applies medical transcription techniques, technologies, and editing skills needed to prepare to work in the medical transcription profession. Knowledge of the content and format of medical reports typically dictated in clinics, hospitals, and hospital ancillary and support facilities will be developed. Progressive transcription skill building is achieved through medical specialty-based patient studies. Prerequisites: OA 225 Applied Document Processing; MO 5.630 Medical Terminology and Body Systems I; OA 2.656M Medical Information Processing.

OA 2.529 Applied Medical Transcription
(10 class hrs/wk, 1–5 cr) F/W/Sp/Su
The medical transcription student applies medical transcription techniques, technologies, and editing skills needed to prepare to work in the medical transcription profession. Knowledge of the content and format of medical reports typically dictated in clinics, hospitals, and hospital ancillary and support facilities will be developed. Progressive transcription skill building is achieved through medical specialty-based patient studies. Prerequisites: MO 5.631 Medical Terminology and Body Systems II; OA 225 Applied Document Processing; OA 2.656M Medical Information Processing.

OA 2.544 Medical Insurance Procedures
(4 class hrs/wk, 4 cr) F/W
Students learn major insurance protocols and how to submit and process claims for each.

OA 2.551M Communications in Business: Medical
(3 class hr/wk 3 cr) W
Students will communicate effectively both in oral and written forms in a variety of medical situations and work collaboratively in teams to problem solve challenging communication issues. Prerequisites: OA 110 Editing Skills for Information Processing, with a minimum grade of "C" or better, OA 202 Word Processing for Business: MS Word

OA 2.590 Readings and Conference: Administrative Support
(2–10 class hrs/wk, 1–5 cr) F/W/Sp/Su
Student will pursue an individualized instructional plan in an area of particular interest or where additional curriculum expertise is needed. Note: Number of credits is determined by the amount of time needed and spent. Prerequisite: Instructor's approval.

OA 2.612 CWE Externship Seminar
(1 class hr/wk, 1 cr) F/W/Sp
Students and instructor will debrief and discuss CWE and externship training experiences. Must be currently enrolled in a CWE or externship class.

OA 2.619 Electronic Health Records
(2 class hr/wk, 1 cr) W/Sp
Medical office professional will learn the basics of electronic medical records using a generic electronic health records program supplemented by the Spring Charts EHR software. Prerequisites: OA 1310 Windows & Computer Fundamentals or OA 202 Word Processing for Business: MS Word, MO 5.630 Medical Terminology and Body Systems I.

OA 2.652 Filing
(4 class hrs/wk, 1 cr) F/W/Sp/Su
Learn and apply ARMA rules for filing paper records for a variety of filing systems.

OA 2.656M Medical Information Processing
(4 class hrs/wk, 3 cr) W/Sp
Prepares student to develop, practice and apply editing and transcription skills to produce accurate medical documents for use in a health care setting. Prerequisites: MO 5.630 Medical Terminology and Body Systems I; OA 125 Document Processing & Formatting or OA 202 Word Processing for Business: MS Word; and OA 110 Editing Skills for Information Processing with a minimum "C" grade.

OA 2.670 Medical Office Procedures
(6 class hrs/wk, 4 cr) F/Sp
Students develop the skills needed to know and perform the clerical and administrative duties and procedures of a medical office. Prerequisites: MO 5.630 Medical Terminology and Body Systems I; OA 2.565M Medical Information Processing; OA 110 Editing Skills for Information Processing with a minimum grade of "C"; OA 2.671 Medical Law and Ethics; OA 201 Word Processing for Business: WordPerfect or OA 202 Word Processing for Business: MS Word; OA 2.619 Electronic Health Records.

OA 2.671 Medical Law and Ethics
(3 class hrs/wk, 3 cr) W
Students learn an ethical framework for evaluating themselves and their environment and the legal requirements assigned to them.

OA 2.672 Basic Coding
(3 class hrs/wk, 3 cr) W/Sp
Students learn to utilize ICD-9 and CPT manuals to translate medical information into billable financial data. Prerequisite: MO 5.630 Medical Terminology and Body Systems I; OA 2.544 Medical Insurance Procedures.

OA 2.675 Legal Practices, Procedures and Terminology I
(4 class hrs/wk, 3 cr) W
Students examine procedures required for administrative support in legal or judicial office setting. Legal document formatting and legal terminology are introduced. Focus on required work ethic and privacy concerns in legal setting, and examine Oregon Rules and Civil Procedures in relation to various areas of civil criminal law. Prerequisite: OA125 Document Processing & Formatting and OA 201 Word Processing for Business: WordPerfect or OA 202 Word Processing for Business: MS Word. Corequisite: OA 110 Editing Skills for Information Processing.

OA 2.676 Legal Practices, Procedures and Terminology II
(4 class hrs/wk, 3 cr) Sp
Continue examination of procedures required for administrative support in legal career areas; legal document formatting; legal terminology; required work ethic and privacy concerns in legal settings; and examination of Oregon Rules and Civil Procedures. Prerequisite: OA 2.675 Legal Practices, Procedures and Terminology I.

OA 2.680 Advanced Coding
(3 class hrs/wk, 3 cr) F/Sp
Students learn to analyze medical coding information to extrapolate financial data that will provide the best opportunity for reimbursement. Prerequisite: OA 2.672 Basic Coding; MO 5.631 Medical Terminology and Body Systems II.

OA 2.681 Coding in the Hospital Environment
(3 class hrs/wk, 3 cr) F/Sp
Student will learn to support the hospital reimbursement mechanism and utilizes hospital coding resources. Prerequisite: OA 2.544 Medical Insurance Procedures, OA 2.672 Basic Coding or commensurate practical experience at the instructor's discretion. Corequisite: OA 2.680 Advanced Coding.

OA 2.691 Preparation for Certifying Exam (Administrative)
(1 class hrs/wk, 1 cr) W
Medical assistant students review administrative competencies to prepare for the national certification exam administered by the American Association of Medical Assistants. Corequisite: Must be enrolled in MO 5.640 Administrative Externship of the Medical Assistant Program.

OST: OCCUPATIONAL SKILLS TRAINING

OST 202 Occupational Skills Training Seminar
(1 class hr/wk, 1 cr) F/W/Sp/Su
The OST seminar provides opportunities for students involved in an OST course to share training-related experience with their OST coordinator.

OST 280 Occupational Skills Training
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
A site-based training program designed to give students experience in a supervised training position related to their occupational goal. Students identify learning outcomes, train a specified number of hours during the term and participate in related seminar activities. Credits earned are based upon completion of identified outcomes and the number of hours spent in training.

OTA: OCCUPATIONAL THERAPY ASSISTANT

OTA 120 Occupational Therapy Foundations
(5 class hrs/wk, 6 cr)
Provides an introduction to and foundation for the study of occupational therapy. Includes an overview of the history and philosophy of the profession and the basic theories that underlie its practice. Addresses the role of occupation in the achievement of health and wellness and the importance of the "therapeutic use of self" in the occupational therapy process. Emphasizes the roles and responsibilities of the occupational therapy assistant as practitioner, advocator, educator, and research assistant, as well as the professional relationship between the occupational therapy assistant and the occupational therapist. Covers the profession's practice framework, scope of practice, standards of practice, code of ethics, and various legal issues that pertain to the field. Explores cultural awareness and cultural competence. Prerequisite: Admission into the OTA program.

OTA 135 Early Childhood Theory and Practice
(7 class hrs/wk, 5 cr)
Explores normal development, common diagnoses, and various occupational contexts associated with early childhood. Students learn theory and practice skills for performing assessments and providing treatment for pediatric clients. Emphasis is placed on safety, documentation, and therapeutic use of self. Prerequisite: Admission into the OTA program.

OTA 140 Activity Analysis
(7 class hrs/wk, 5 cr)
Provides an introduction to and foundation for the study of activity analysis. Examines the impact of the interaction between activity demand, client factors, and contexts on occupational performance. The concepts of human safety and environmental protection are addressed. Provides students the opportunity to develop basic skills for analyzing, grading, and adapting purposeful activities to enhance occupational performance. Students will demonstrate a variety of purposeful activities used in occupational therapy practice and will explore the use of technologies that support the delivery of occupational therapy services. Prerequisite: Admission into the OTA program.

OTA 145 Adolescent and Young Adult Theory and Practice
(7 class hrs/wk, 5 cr)
Explores normal development, common diagnoses, and various occupational context associated with adolescence and young adulthood. Students learn theory and practice skills for performing assessments and providing treatment for adolescent and young adult clients. Emphasis is placed on safety, documentation, and therapeutic use of self. Prerequisite: Admission into the OTA program.

OTA 160 Level I Fieldwork
(4 class hrs/wk, 1 cr)
Provides students the opportunity to observe occupational therapy in one or more settings, and to participate in select aspects of the occupational therapy process. Students begin to integrate theory learned in the classroom with practice observed in the workplace. Particular emphasis is placed on observation, communication, and professional attitudes and behaviors. Prerequisite: Admission into the OTA program.

OTA 220 Middle and Older Adult Theory and Practice
(7 class hrs/wk, 5 cr)
Explores normal development, common diagnoses, and various occupational contexts associated with middle and older adulthood. Students learn theory and practice skills for performing assessments and providing treatment for middle-aged adult and geriatric clients. Emphasis is placed on safety, documentation, and therapeutic use of self. Prerequisite: Admission into the OTA program.

OTA 230 Innovative Theory and Practice
(3 class hrs/wk, 3 cr)
Offers students the opportunity to explore emerging and potential areas of practice in occupational therapy. Students develop basic skills for assisting with research in occupational therapy. Prerequisite: Admission into the OTA program.

OTA 240 Administration and Management
(3 class hrs/wk, 3 cr)
Provides students the opportunity to learn health administrative concepts and to practice clinical management skills. Topics include governmental regulation, organizational improvement, workload management, reimbursement methods, and inventory systems. Prerequisite: Admission into the OTA program.

OTA 260 Level II Fieldwork A
(32 class hrs/wk, 10 cr)
Provides students the opportunity to further develop the knowledge, skills, behaviors, and attitudes needed to function as competent, entry-level, generalist occupational therapy assistants. Students will carry out professional responsibilities of the occupational therapy assistant under supervision, including delivery of occupational therapy services to a variety of clients. Together, Level II Fieldwork A and Level II Fieldwork B form the "capstone" experience for the Occupational Therapy Assistant Associate of Applied Science Degree Program. Prerequisite: Admission into the OTA program.

OTA 261 Level II Fieldwork A Seminar
(1 class hr/wk, 1 cr)
Allows for individual reflection and group discussion of occupational therapy practice issues while students are gaining experience in Level II Fieldwork. Emphasis is placed on tying theory to practice. Prerequisite: Admission into the OTA program. Co-requisite: OTA 260 Level II Fieldwork A

OTA 270 Level II Fieldwork B
(32 class hrs/wk, 10 cr)
Provides students the opportunity to further develop the knowledge, skills, behaviors, and attitudes needed to function as competent, entry-level, generalist occupational therapy assistants. Students will carry out professional responsibilities of the occupational therapy assistant under supervision, including delivery of occupational therapy services to a variety of clients. Together, Level II Fieldwork A and Level II Fieldwork B form the "capstone" experience for the Occupational Therapy Assistant Associate of Applied Science Degree Program. Prerequisite: Admission into the OTA program.

OTA 271 Level II Fieldwork B Seminar
(1 class hrs/wk, 1 cr)
Allows for individual reflection and group discussion of occupational therapy practice issues while students are gaining experience in Level II Fieldwork. Emphasis is placed on tying theory to practice. Prerequisite: Admission into the OTA program. Co-requisite: OTA 260 Level II Fieldwork B.

PE: PHYSICAL EDUCATION

PE 131 Introduction to Health and Physical Education
(3 class hrs/wk, 3 cr) F/W/Sp
Surveys professional opportunities in the area of health and physical education. Provides a basic philosophy of physical education and health as well as objectives. Qualifications of a variety of related occupations are discussed. Required for all physical education and health majors.

PE 180B Advanced Basketball: Women
(3 class hrs/wk, 1 cr) F/Sp
Provides a detailed presentation of individual basketball skills and on-court strategy for team play. Prerequisite: PE 180D Basketball Conditioning: Women, and instructor's approval.

PE 180C Basketball Skills: Women
(3 class hrs/wk, 1 cr) Sp
Continued emphasis on conditioning for overall efficiency of basketball skills. Provides a detailed presentation of basketball skills and a plan for overall improvement. Prerequisite: PE 180D Basketball Conditioning: Women, and instructor's approval.

PE 180D Basketball Conditioning: Women
(10 class hrs/wk, 1 cr) F
Emphasis is on development of strength conditioning, aerobic fitness and agility drills needed in improving basketball skills. Three-week class.

PE 180G Advanced Volleyball: Women
(3 class hrs/wk, 1 cr) W/Sp
Emphasizes the development of skills for team play. Instructor's approval required.

PE 180H Volleyball Conditioning: Women
(10 class hrs/wk, 1 cr) F
Emphasis on development of strength conditioning, aerobic fitness, agility and pylometric drills needed in improving volleyball skills. Three-week course. Instructor's approval required.

PE 1851 Beginning Volleyball
(3 class hrs/wk, 1 cr) F/W/Sp
Introduces the skills and techniques basic to volleyball, including different offensive and defensive forms of team play, strategies, etiquette and rules of the game.

PE 1851 Intermediate Volleyball
(3 class hrs/wk, 1 cr) F/W/Sp
Emphasizes increasing a player's abilities within a team situation. Designed for the player who has mastered beginning volleyball skills.

PE 1851 Advanced Volleyball
(3 class hrs/wk, 1 cr) W/Sp
Increases skill levels and mental strategies, with emphasis on increasing a player's abilities within a team situation.

PE 1852 Walk for Health
(3 class hrs/wk, 1 cr) F/W/Sp
Emphasizes the health and fitness benefits of a regular walking program, including strengthening and stretching activities. Instruction focuses on fitness walking and mechanics, physiological and psychological effects of walking, injury prevention, equipment and long-term exercise commitment.

PE 1853 Cardio Kick Boxing
(3 class hrs/wk, 1 cr) Intermittently
Provides the students with the techniques of kick boxing. This includes benefits, safety precautions, and specific fitness principles.

PE 1854 Advanced Weight Training
(3 class hrs/wk, 1 cr) F/W/Sp
Provides instruction and practices in conditioning programs specific to sports participation.

PE 1855 Relaxation and Massage
(3 class hrs/wk, 1 cr) Intermittently
Designed to provide the student with the knowledge and skills needed to incorporate and practice a variety of techniques of relaxation and massage. Massage and relaxation are two basic and effective ways of attaining and maintaining good health and reducing stress.

PE 1857 Intermediate Basketball
(3 class hrs/wk, 1 cr) F/W/Sp
Emphasizes basketball conditioning, skill development and game situations. Features game format.

PE 1858 Modern Dance
(3 class hrs/wk, 1 cr) Intermittently
This class will explore: gaining strength and stability in core support, moving from center, dynamic alignment, three dimensional use of the spine and torso, experiments in gravity, breath, weight and floor work. Special attention will be given to spatial awareness, rhythm and musicality and the exploring the body's expressive potential.

PE 185A Circuit Weight Training
(3 class hrs/wk, 1 cr) F/W/Sp
Provides instruction and participation in circuit training routines designed to improve muscular strength, muscular endurance, flexibility and body composition.

PE 185E Beginning Ballet
(3 class hrs/wk, 1 cr) Intermittently
Provides an exercise program choreographed to music and designed to study the basic elements of dance as well as mechanics of ballet movements, alignment, balance and terminology.

PE 185E Intermediate Ballet
(3 class hrs/wk, 1 cr) Intermittently
Provides an exercise program choreographed to music and designed to study the intermediate elements of dance as well as mechanics of ballet movements, alignment, balance and terminology. Prerequisite: One year of beginning ballet.

PE 185F Bowling
(3 class hrs/wk, 1 cr) F/W/Sp
Students will increase proficiency in bowling skills and techniques. Rules and courtesies of the game as well as social and recreational values to the student are stressed.

PE 185G Body Conditioning
(3 class hrs/wk, 1 cr) F/W/Sp
Provides instruction and practice in exercises that condition the body. Techniques taught for using free and fixed weights and aerobic equipment. Flexibility, strength and physical endurance emphasized.

PE 185GS Beginning Soccer
(3 class hrs/wk, 1 cr) Intermittently
Provides basic skills, rules and strategies for soccer. Includes dribbling, kicking, trapping, heading, throw-in, tackling, shooting, goalie play, corner kicks, penalty kicks, soccer formations, offensive and defensive play.

PE 185K Beginning Step Aerobics
(3 class hrs/wk, 1 cr) F/W/Sp
Introduces students to stepping techniques, including proper and safe movement on and off the bench. Students increase their skill level to enter step classes offered at any level. Students also build on all stepping techniques, including "adding on" to patterns and transitioning into new combinations.

PE 185K Intermediate Step Aerobics
(3 class hrs/wk, 1 cr) F/W/Sp
Designed to meet the needs of experienced step aerobic participants. Students learn to execute more advanced combinations, plus improve their fitness level by learning power moves designed to increase the intensity level of their workout.

PE 185L Yoga
(3 class hrs/wk, 1 cr) Intermittently
A beginning-level class where students learn basic yoga poses and are given options so they can work at their own level. Breathing, stretching and relaxation are focused on in class. Benefits include greater flexibility and strength and reduced stress. Classes end with five minutes of deep relaxation.

PE 185L Yoga Strength
(3 class hrs/wk, 1 cr) Intermittently
Combines the benefits of yoga with strength training. Sets of repetitions with weights are performed throughout the class to tone and strengthen all major muscle groups of the body. This challenging class improves flexibility and leaves participants enjoying the positive, calming effects of yoga and the strengthening, toning benefits of weight training.

PE 185L Restorative Yoga
(3 class hrs/wk, 1 cr) Intermittently
Students learn deep relaxation and renewal techniques with the use of props. Class will focus mainly on rest and relaxation but will also include basic yoga poses, breathing and stretching. Students will benefit from increased flexibility, greater body awareness, and reduced feelings of stress. This class is especially helpful for students taking challenging classes or those with stressful jobs or lives.

PE 185M Beginning Golf
(6 class hrs/wk, 1 cr) F/Sp
Introduces the mental and physical needs involved in golf, including grip, stance, swing techniques, rules, strategy and etiquette. Note: Eight-week class.

PE 185M Intermediate Golf
(6 class hrs/wk, 1 cr) F/Sp
Provides a more detailed presentation of golf techniques and strategy to improve and correct basic swing errors. PE 185M Beginning Golf recommended or intermediate skill. Note: Eight-week class.

PE 185M Advanced Golf
(6 class hrs/wk, 1 cr) Intermittently
Provides a detailed presentation of golf technique and strategy to improve and correct basic swing errors. Also includes on-course play. PE 185M Beginning Golf recommended or intermediate skill. Note: Eight-week class.

PE 185N Pilates
(3 class hrs/wk, 1 cr) F/W/Sp
Provides a non-impact, invigorating approach to physical conditioning and mind/body awareness.

PE 185P Jogging
(3 class hrs/wk, 1 cr) F/W/Sp
Emphasizes the health and fitness benefits of a regular jogging program, including strengthening and stretching activities. Instruction focuses on mechanics of jogging, physiological and psychological effects of jogging, injury prevention, equipment and long-term exercise commitment.

PE 185Q Beginning Karate
(3 class hrs/wk, 1 cr) F/W/Sp
Introduces the student to the American Kenpo Karate System. Includes basics such as blocking, striking and kicking. Self-defense movements and katas (forms) will also be covered. Emphasizes proper warm-up, calisthenics and stretching to establish and maintain good body condition.

PE 185Q Intermediate Karate
(3 class hrs/wk, 1 cr) F/W/Sp
Focuses training in the American Kenpo Karate System and includes continued development of basics, higher level katas (forms) and the enhancement and development of self defense techniques. Emphasizes proper warm-up, calisthenics and stretching to establish and maintain good body condition.

PE 185R Hip Hop Aerobic Dance
(3 class hrs/wk, 1 cr) Intermittently
An introductory class that utilizes elements of Hip-Hop, jazz dance and other contemporary dance forms. It is a fun, high-energy class. Students should be in good physical condition without chronic injuries.

PE 185S Beginning SCUBA
(4 class hrs/wk, 2 cr) Intermittently
Provides instruction in the use of self-contained underwater breathing apparatus (SCUBA) Includes six academic (classroom) modules, six confined water (pool) modules and open-water dives to certify students as a PADI Open Water Scuba Diver. Note: Eight-week class.

PE 185T Flag Football
(4 class hrs/wk, 1 cr) Intermittently
Emphasizes playing flag football for fun and fitness. Instruction focuses on key points of the game, including safety, equipment, rules, strategy, conditioning, injury prevention, team leadership, as well as development of stance, blocking, passing, catching, flag tackling and kicking skills.

PE 185U Sand Volleyball
(4 class hrs/wk, 1 cr) Sp
Introduces skills and techniques to basic and intermediate sand volleyball, including different offensive and defensive formats of team play, strategies, and etiquette of the game.

PE 185V Ultimate Frisbee
(3 class hrs/wk, 1 cr) F/Sp
Introduces the skills and techniques basic to ultimate frisbee, including offensive and defensive play, strategies, etiquette and rules of the game.

PE 185X Cardio Core Conditioning
(3 class hrs/wk, 1 cr) Intermittently
Designed to improve daily functioning, this class integrates rhythmic cardiovascular and resistance exercises with core conditioning techniques. Students develop deep muscles within the torso to improve stability, mobility, strength and endurance. Steps, hand weights and elastic bands are utilized to maximize exercise benefits. This class format is suitable for students of various fitness levels.

PE 185Y Beginning Tennis
(4 class hrs/wk, 1 cr) F/Sp
An elective course for the novice or beginning student that will provide instruction, playing experience and knowledge of the basic stroke fundamentals of ground strokes, volleys, lob, serve and overhead smash. Playing rules, scoring, court etiquette, conditioning, equipment and playing strategy for singles and doubles will be discussed.

PE 185Y Intermediate Tennis
(4 class hrs/wk, 1 cr) F/Sp
Covers advanced tennis strategies and skills. Intermediate skill or beginning tennis recommended.

PE 185Y Advanced Tennis
(4 class hrs/wk, 1 cr) Sp
Prepares students for competition, emphasizing development of skills for competitive play. Intermediate skill or beginning tennis recommended.

PE 186F Beginning/Intermediate Jazz Dance
(3 class hrs/wk, 1 cr) Intermittently
Introductory course in jazz dance. Basic fundamentals of this contemporary dance form will be taught in a typical technique class structure. This will consist in warm up, floor work and combinations. The class will explore a full spectrum of jazz dance including vintage, classic and Broadway style, as well as contemporary styles such as lyrical, street jazz and hip-hop.

PE 190A Baseball Conditioning
(10 class hrs/wk, 1 cr) Sp
Emphasizes physical conditioning that develops strength and agility for better efficiency in baseball skills. Team concepts are taught through offensive and defensive strategies to improve team play. Three-week course. Prerequisite: PE 190C Beginning Baseball or instructor's approval.

PE 190B Baseball Skills: Hitting and Pitching
(3 class hrs/wk, 1 cr) W
Enables student to refine basic baseball skills in hitting, pitching and catching. Provides instruction and practice in team offensive hitting concepts and pitching philosophies. Prerequisite: PE 190C Beginning Baseball or instructor's approval.

PE 190C Beginning Baseball
(10 class hrs/wk, 1 cr) F
Introduces fundamental baseball skills. Some aerobic conditioning skills are used to develop general stamina. Learning is enhanced through scrimmage format. Three-week class.

PE 190D Advanced Baseball
(3 class hrs/wk, 1 cr) Intermittently
Helps develop the advanced student in the game of baseball. Individual and team concepts are taught to ensure a high level of play from its participants. Prerequisite: Beginning baseball and instructor's approval.

PE 190H Advanced Basketball: Men
(3 class hrs/wk, 1 cr) F/Sp
Provides a detailed presentation of individual basketball skills and on-court strategy for team play. Prerequisite: PE 190J Basketball Conditioning: Men, or instructor's approval.

PE 190J Basketball Conditioning
(10 class hrs/wk, 1 cr) F
Emphasis is on development of strength conditioning, aerobic fitness and agility drills needed in improving basketball skills. Three-week course.

PE 190K Basketball Skills: Men
(3 class hrs/wk, 1 cr) F
Continued emphasis on conditioning for overall efficiency of basketball skills. Provides a detailed presentation of basketball skills and a plan for overall improvement. Prerequisite: PE 190J Basketball Conditioning: Men, and instructor's approval.

PE 194H Essentials of Personal Training II
(4 class hrs/wk, 3 cr) Intermittently
Provides working knowledge in anatomy, biomechanics, physiology, bio-energetics, adaptations to resistance and aerobic exercise, nutrition and exercise psychology. The first in a two-class series preparing students to sit for nationally recognized fitness credentials as a fitness leader and/or personal trainer.

PE 194M Essentials of Personal Training I
(4 class hrs/wk, 3 cr) Intermittently
Provides working knowledge in assessment, program design, exercise technique, spotting techniques, special needs populations, safety and floor design. The second in a two-class series preparing students to sit for nationally recognized fitness credentials as a fitness leader and/or personal trainer.

PE 199A Tai Chi
(3 class hrs/wk, 1 cr) F/W/Sp
Explore this ancient form of gentle movement, which emphasizes balance, concentration and coordination. Learn traditional styles of Tai Chi in an easy-to-follow format. Gain strength while relieving tension and stress.

PE 231 Lifetime Health and Fitness
(3 class hrs/wk, 3 cr) F/W/Sp/Su
Evaluates selected areas of the student's present health and fitness level. Provides information on each of the seven wellness dimensions as they relate to physical fitness, back care, heart health, stress management, nutrition, weight management, behavioral change, and lifestyle choices. Considers work-life balance and self-responsibility. Shows the student how to enter the work site as a fit and healthy individual and suggests ways to maintain that level of health.

PE 232 Backpacking: Map and Compass Skills
(3 class hrs/wk, 3 cr) Sp
Prepares the individual for safe, challenging and enjoyable wilderness trips. Emphasizes physical conditioning, equipment, clothing, food, safety and the use of map and compass.

PE 270 Sport Psychology
(3 class hrs/wk, 3 cr) F
Students will be introduced to mental, physical, social and psychological aspects of athletic performance and the significance of sport as it relates to culture, socialization, character development, personality, race, gender, economics and mass media.

PE 280A CWE Physical Education
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
An instructional program designed to give students practical experience in supervised employment related to physical education. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. CWE coordinator's approval. required

PE 280B CWE Recreation
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
An instructional program designed to give students practical experience in supervised employment related to recreation. Students identify job performance objectives, work a specified number of hours during the term and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. CWE coordinator's approval required.

PE 291 Lifeguard Training
(3 class hrs/wk, 2 cr) Sp
Introduces students to the necessary minimum knowledge and skills training for a person to qualify to serve as an entry-level lifeguard and Red Cross certification. Swimming pretest required.

PE 292 Water Safety Instructor
(6 class hrs/wk, 2 cr) Sp
Trains students to teach swimming and other water safety skills. Practice teaching will include lesson planning, teaching methods, teaching to diverse groups of students and student evaluations. Must be 17 years old (by the end of the course), successfully pass the written and skill pretest (based on a proficiency level equal to the Red Cross Community Water Safety Course and Level VI learn-to-swim skills).

PH: PHARMACY TECHNICIAN

PH 5.901 Pharmacy Technician
(30 hrs, 3 cr) As needed
Focuses on the competencies required by pharmacy technicians in institutional and community pharmacy settings. Students will learn and practice the roles and responsibilities of the pharmacy technician. Also, this course prepares learners to take the national Pharmacy Technician Certification Exam administered by the Pharmacy Technician Certification Board. Prerequisite: Admission to the Pharmacy Technician Program.

PH 5.905 Pharmacy Laws and Ethics
(20 hrs, 2 cr) As needed
Covers the rules and regulations that govern pharmacies in the state of Oregon. By the end of the course, each student will understand the ethical, professional and confidentiality standards set by the medical and pharmaceutical professions; maintain patient/customer confidentiality according to state and federal laws; and be able to look up any rule regarding the practice of pharmacy in the Oregon Revised Board of Pharmacy Statutes. Prerequisite: Admission to the Pharmacy Technician Program.

PH 5.910 Pharmacy Math
(48 hrs, 4 cr) As needed
Develops math skills needed to become a pharmacy technician in a retail or hospital setting. Topics include: fractions, decimals, ratios and proportions in dosage calculation; changing within the household; metric and apothecary systems of measurement; calculations necessary for preparing pharmaceutical solutions and determining IV flow rates. Prerequisite: Admission to the Pharmacy Technician Program.

PH 5.915 Pharmacology and Drug Classification for Pharmacy Technicians
(54 hrs, 5 cr) As needed
Prepares students training to work as a member of a Pharmacy Technician health care team to effectively communicate pharmaceutical information to a variety of health care professionals using correct spelling and pronunciations of selected pharmaceuticals, which will help ensure patient safety in pharmaceutical usage. Students will obtain knowledge of a large number of pharmaceuticals including generic and trade names and an understanding of how they work in the body, including the usual dosage of a drug. Prerequisite: Admission to the Pharmacy Technician Program.

PH 5.920 Pharmacy Operations: Retail and Institutional
(35 hrs, 2 cr) As needed
Focuses on drug distribution systems, record management and inventory control, and ambulatory and institutional practices. Students will learn how hospital and retail pharmacies operate. Prerequisite: Admission to the Pharmacy Technician Program.

PH: PHLEBOTOMY

PH 5.310 Phlebotomy
(100 hrs, 8 cr) As needed
Provides skill development in the performance of a variety of blood collection methods using proper techniques and universal precautions. Includes vacuum collection, arterial specimen collection, devices syringes, capillary skin punctures, radial artery punctures for blood gasses, butterfly needles, blood cultures and specimen collection on adults, children and infants. Emphasis on infection prevention, proper patient identification, labeling of specimens and quality assurance, specimen handling, processing and accessioning. An overview of Medicare billing will also be covered.

PH 5.320 Anatomy and Physiology for Phlebotomists
(20 hrs, 2 cr) As needed
Provides an overview of basic anatomy and physiology of body systems and anatomic terminology. Relates major areas of the clinical laboratory to general pathologic conditions associated with the body systems. Systems include: circulation, heart, lymph, respiratory, urinary, cells and blood, and muscular/skeletal. Students acquire skills to identify veins of arms, hands, legs and feet on which phlebotomy is performed.

PH 5.330 Communication and Customer Service for Phlebotomists
(30 hrs, 2 cr) As needed
Students acquire skills in the basic concepts of communication, personal and patient interaction, stress management and professional behavior. Topics include: proactive listening; giving and receiving constructive feedback; maintaining a professional image; working well as a team; proper manner for greeting and interacting with a patient, physician, nurse, respiratory therapist and other hospital personnel; communicating instructions effectively; telephone skills, knowledge of basic ICD-9 coding systems and CPT-4 codes for insurance billing.

PH: PHYSICS

PH 104 Descriptive Astronomy
●*(5 class hrs/wk, 4 cr) F/W/Sp*
An introductory course covering the historical and cultural context of discoveries concerning planets and stars and their motion. Topics include models and the scientific method, astronomical tools, the solar system, stars and stellar evolution, galaxies and cosmology. An accompanying laboratory is used for experiments, including outdoor observations. Prerequisite: MTH 065 Elementary Algebra or equivalent. This course includes a laboratory component.

PH 201 General Physics
●*(7 class hrs/wk, 5 cr) F/W*
The first of a three-term sequence of introductory college physics for students who are planning to transfer credit to a four-year college or university, or for anyone desiring an understanding of physics principles. Topics covered include: mechanics, force and motion in one-and two-dimensions, circular motion, gravitation, energy, linear and angular momentum, and simple harmonic motion. Lab exercises help elucidate physical principles and teach measurement and analysis skills. Prerequisite: Completion of MTH 112 Trigonometry with a grade of "C" or better. Recommended: High school physics, GS 104 Principles of Physics, or PH 199 Computational Physics. This course includes a laboratory component.

PH 202 General Physics
●*(7 class hrs/wk, 5 cr) W/Sp*
The second of a three-term sequence of introductory college physics for students who are planning to transfer credit to a four-year college or university, or for anyone desiring an understanding of physics principles. The themes of thermodynamics, waves and electricity will be explored. Specific topics include fluids, temperature, heat, thermodynamics, wave motion, sound, electrostatic force, field, potential, and circuits. Prerequisite: Completion of PH 201 General Physics with a "C" or better. This course includes a laboratory component.

PH 203 General Physics
●*(7 class hrs/wk, 5 cr) Sp/Su*
The third term of a three-term sequence of introductory college physics for students who are planning to transfer credit to a four-year college or university, or for anyone desiring an understanding of physics principles. The topics covered in this course include geometric and physical optics, magnetism, electromagnetic induction, AC and DC circuits, atomic physics, and nuclear processes. Prerequisites: Completion of PH 201 General Physics with a grade of "C" or better and completion of PH 202 General Physics with a "C" or better. This course includes a laboratory component.

PH 211 General Physics with Calculus
●*(7 class hrs/wk, 5 cr) F/W*
The first of a three-term calculus-based sequence of introductory college physics for students in science, engineering and other curricula who are planning to transfer credit to a four-year college or university, or for anyone desiring an understanding of physics principles. Topics include measurement; scientific models; motion in a straight line; motion in two dimensions; vectors; force and motion; Newton's laws of motion; energy momentum; conservation laws; center of mass; linear and angular momentum; universal gravitation. Lab exercises help elucidate physical principles and teach measurement and analysis skills. Prerequisites: Completion of MTH 251 Differential Calculus and MTH 252 Integral Calculus with a grade of "C" or better. Recommended high school physics, GS 104 Physical Science: Principles of Physics, or PH 199 Computational Physics. This course includes a laboratory component.

PH 212 General Physics with Calculus
●*(7 class hrs/wk, 5 cr) W/Sp*
The second of a three-term calculus-based sequence of introductory college physics for students in science, engineering and other curricula who are planning to transfer credit to a four-year college or university, or for anyone desiring an understanding of physics principles. Topics include universal gravitation, rotational mechanics and dynamics, static equilibrium; fluid mechanics; simple harmonic motion; waves; superposition of waves; sound; and geometric and physical optics; matter waves. Lab exercises help elucidate physical principles and teach measurement and analysis skills. Prerequisites: MTH 252 and PH 211 General Physics with Calculus with a grade of "C" or better. Recommended Corequisite of MTH 254 Calculus for those students who will take PH 213. This course includes a laboratory component.

PH 213 General Physics with Calculus
●*(7 class hrs/wk, 5 cr) Sp/Su*
The third of a three-term calculus-based sequence of introductory college physics for students who are planning to transfer credit to a four-year college or university, or for anyone desiring an understanding of physics principles. Topics include electrostatic force, field and potential; current and resistance capacitance; magnetic field; forces on charged particles due to a magnetic field; Hall effect and other applications of electric and magnetic fields; Law of Biot and Savart; Ampere's law; magnetic dipoles; Faraday's law of induction; Lenz's law; induced electric fields; self and mutual induction; RC and RL direct current circuits; magnetic properties of matter; AC and DC circuits; displacement currents and Maxwell's equations; electromagnetic waves. Prerequisites: PH 212 General Physics with Calculus and MTH 254 Calculus with a "C" or better. This course includes a laboratory component.

PH 299 Special Studies
(2–6 hrs/wk, 1–3 cr) As needed
Allows the student to investigate, with supervision from a faculty member, a topic of his or her interest at an individualized pace. Credits and projects will be determined jointly by the instructor and the student.

PHL: PHILOSOPHY

PHL 198 Independent Studies
(1 class hr/wk, 1–3 cr) As needed
Offers selected philosophy topics for independent research. Instructor's approval required.

PHL 201 Introduction to Philosophy
➢*(3 class hrs/wk, 3 cr) F*
Introduces students to the following: the nature of critical thinking and its role in everyday life; the history of critical thinking, especially in the Western World; the major themes that have dominated philosophy over the past three thousand years, and the trends these themes are taking in contemporary society. Recommended: College level reading and writing skills.

PHL 202 Elementary Ethics
➢*(3 class hrs/wk, 3 cr) W*
Introduces students to the following: a brief history of ethical theory; a proposed explanation for the beginning of ethical theory during the Axial Age; the effect religion has had on ethical theories; the effect that science has had on ethical theories; the relationship of ethics to the reasoning process and the application of ethics to modern moral dilemmas. Recommended: College level reading and writing skills.

PHL 215 History of Western Philosophy
➢*(3 class hrs/wk, 3 cr) Sp*
Introduces students to the major philosophers and issues of the past 2,500 years and the historical conditions that have affected, and been affected by, the development of philosophy. An attempt is made to embrace a study of significant thinkers from all cultures throughout the ages. The major emphasis of the course, however, is on the philosophies of the Western World. Recommended: College level reading and writing skills.

PHL 298 Independent Study: Logic
➢*(1 class hr/wk, 1–3 cr) As needed*
Offers individual study of patterns of logic, rules of inference through formalized logical language, and techniques of deductive and predicate logic.

PS: POLITICAL SCIENCE

PS 201 Introduction to American Politics and Government
■*(3 class hrs/wk, 3 cr) W*
Introduces and analyzes the American political system. Studies the development and operation of the institutions of national government, the political process (elections, public opinion, interest group activities, policy-making), the American political culture, and the American political-economy (capitalism and American politics). Includes case studies of federalism, election rules, civil society, and lobbying. Recommended: College level reading and writing skills.

PS 204 Introduction to Comparative Politics
■*(3 class hrs/wk, 3 cr) W*
Introduces major political, economic, and social concepts applied comparatively to a variety of governments and political systems including democracies, dictatorships, and theocracies. Focus is on Europe, former communist states, and Third World states of Africa, the Middle East, Asia, and Latin America. Uses case studies of political conflicts and social movements as well as role-playing and simulations. Recommended: College level reading and writing skills.

PS 205 Introduction to International Relations
■*(3 class hrs/wk, 3 cr) F*
Introduces analyses of current world events; the nature of the international political and economic systems; and alternative perspectives, strategies, and approaches to contemporary world problems. Topics include global diversity; poverty and economic development; environmental and resource issues; and war and peace. Recommended: College level reading and writing skills.

PS 211 Peace and Conflict
■*(3 class hrs/wk, 3 cr) Sp*
Examines the sources and causes of violence in relations involving individuals, groups, nations, and the global community. Focuses on alternatives to oppressive behavior, undemocratic politics, and the violent resolution of conflict by exploring the ideas and strategies of nonviolence. Recommended: College level reading and writing skills.

PS 280 CWE Political Science
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to political science. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. CWE coordinator's approval required.

PS 280S Service-Learning Political Science
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
An instructional program, using contextual learning, designed to promote critical thinking, citizenship and civic responsibility as students work with community partners in addressing real community needs. Students identify learning objectives, work a specified number of hours during the term, and engage in faculty-led guided reflection activities. Students must have taken or must be currently taking appropriate course or courses in their major field of study. They must also have their Service-Learning approved by the appropriate faculty coordinator.

PSG: POLYSOMNOGRAPHIC TECHNOLOGY

PSG 102 Basic Polysomnography
(50 hrs, 5 cr) As needed
History and overview of sleep medicine and the role of the polysomnography technician. Introduction to the physiology of sleep and indications, contraindications, purposes, and hazards of polysomnographic care modalities. Focus is placed on an understanding of basic neurology, with emphasis on basic electroencephalography (EEG) patterns and anatomy of the central and peripheral nervous system.

PSG 103 Therapeutic Modalities I
(50 hrs, 5 cr) As needed
Overview of the preparation and role of the polysomnography technician as a health care professional. Topics include professionalism, understanding physician orders, charting, health/illness continuum, therapeutic communication, functional cardiopulmonary anatomy, and the basics of assessment.

PSG 204 Clinical Sleep Disorders
(40 hrs, 4 cr) As needed
Comprehensive examination of a wide range of sleep disorders, their etiology, and treatment options.

PSG 205 Advanced Polysomnography
(50 hrs, 5 cr) As needed
This course covers advanced sleep studies and treatment modalities in polysomnography.

PSG 207 Therapeutic Modalities II
(20 hrs, 2 cr) As needed
Presents basic principles of positive airway pressure (PAP) through the use of CPAP and BiPAP. Topics covered will include determination of need, equipment set up, oxygen/pressure titration, and instructing the patient on home use.

PSG 208 Preparation for RPSGT Examination
(20 hrs, 2 cr) As needed
This course is intended for individuals currently working as polysomnography technologists and students currently enrolled in the Polysomnography program. The Registered Polysomnographic Technologist (RPSGT) exam is broken down into units and examined through lecture and practice exams. Areas of test weaknesses are identified through practice exams with individual instructor feedback provided. Students use the online discussion board to work on group projects with classmates to enhance the learning experience.

PSG 211 Fundamentals of Sleep Monitoring Equipment
(84 hrs, 5 cr) As needed
Introduces students to the basic technology used in the monitoring of sleep. Principles of electricity and amplification are introduced. Covers patient hook-up and monitoring; calibration and troubleshooting of equipment; data acquisition; and basic scoring.

PSG 215 Polysomnographic Scoring and Analysis
(84 hrs, 5 cr) As needed
Introduction to scoring and analysis of polysomnography testing. Students will learn the procedures necessary to generate and validate a report of the scoring of objective and subjective data obtained in a polysomnographic study.

PSG 221 Current Topics in Sleep Medicine
(10 hrs, 1 cr) As needed
Lectures on current topics in polysomnography and related areas of medicine. Case studies are presented by various sleep technicians.

PSG 297A Polysomnography Practicum
(120 hrs, 4 cr)
This clinical practice experience is designed for the development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of polysomnographic procedures. The planned clinical experience provides the student with the opportunity to observe and apply theoretical principles while performing procedures under supervision of the clinical staff. Progression in the program is dependent on the student

demonstrating clinical competence on a specified number of competency evaluations, including the ability to communicate effectively and reassure patients; safely hook up and monitor patients; monitor and troubleshoot equipment during sleep studies.

PSG 297B Polysomnography Practicum
(150 hrs, 5 cr)
This clinical practice experience is designed for the development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of polysomnographic procedures. The planned clinical experience provides the student with the opportunity to observe and apply theoretical principles while performing procedures under supervision of the clinical staff. Progression in the program is dependent on the student demonstrating clinical competence on a specified number of competency evaluations, including the ability to communicate effectively and reassure patients; safely hook up and monitor patients; monitor and troubleshoot equipment during sleep studies.

PSY: PSYCHOLOGY

PSY 101 Psychology and Human Relations
■*(3 class hrs/wk, 3 cr) F/W/Sp*
Psychology and human relations focuses on practical applications of psychology to relationships. Topics include models for understanding individual and social behavior, self and social perception, emotional self-regulation, physical and mental health, addictions, attraction, relationship formation and maintenance, leaders and followers, stress, work, leisure time, sexuality, commitment, and brief introduction to the clinical aspects of human behavior.

PSY 201 General Psychology
■*(3 class hrs/wk, 3 cr) F/W/Sp*
Discusses biological and scientific aspects of psychology including history, scientific methodology, genes and evolution, the brain and nervous system, biological rhythms and mental states, sensation and perception, and development. Recommended: College level reading and writing skills.

PSY 202 General Psychology
■*(3 class hrs/wk, 3 cr) F/W/Sp*
Discusses the cognitive aspects of psychology, including scientific methodology, learning, memory, thinking, intelligence, motivation and emotion. Recommended: College level reading and writing skills.

PSY 203 General Psychology
■*(3 class hrs/wk, 3 cr) F/W/Sp*
Discusses issues of psychological health, personality development, and the social context within the science of human behavior. Topics include: scientific methodology; the brain and the nervous system; personality development; health psychology; psychological disorders; treatment approaches; and the social context of behavior. Recommended: College level reading and writing skills.

PSY 215 Introduction to Developmental Psychology
■*(3 class hrs/wk, 3 cr) F/W/Sp*
Explores physical, psychological, emotional, and social development from birth to death. Topics include: historical foundations; research methodology; and prominent theories/research of each developmental sequence across the lifespan. Recommended: College level reading and writing skills.

PSY 216 Social Psychology
■*(3 class hrs/wk, 3 cr) W/Sp*
Social psychology studies the social nature of human behaviors, attitudes, perceptions, thoughts and emotions. Major areas of study include: research methods, social perception and judgment, attitude formation and change, prejudice, discrimination, sexism, aggression, interpersonal attraction altruism, conformity, group dynamics, and the application of social psychology findings to current social issues. Recommended: College level reading and writing skills.

PSY 219 Introduction to Abnormal Psychology
■*(3 class hrs/wk, 3 cr) F/Sp*
An introduction to the study of psychological disorders, including issues of diagnosis and treatment. Topics include: models of abnormality; overview of major disorders, including diagnostic considerations; current research on treatment effectiveness; and the impact of psychological disorders on society and its legal system. Recommended: College level reading and writing skills.

PSY 231 Human Sexuality
■*(3 class hrs/wk, 3 cr) F/W/Sp*
Discusses the biological, social and psychological aspects of human sexual functioning within a scientific context. Topics include sexual anatomy, sexual response, gender identity, gender roles, sexual orientation, love, contraception, sexually transmitted infections and sexual coercion. Recommended: College level reading and writing skills.

PSY 280 CWE Psychology
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to psychology. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar.
Note: Credits are based on identified objectives and number of hours worked. CWE coordinator's approval required.

R: RELIGION

R 101 Introduction to Religious Studies
➢*(3 class hrs/wk, 3 cr) As needed*
Explores the nature of religion as experienced historically throughout the world. Examines the nature of religious experience with the divine and the relationship between science and religion. Discusses the roles of language, myths, and symbols in religion. Recommended: College level reading and writing skills.

R 102 Religions of Western World
(3 class hrs/wk, 3 cr) As needed
Investigates religion in the Western World. Includes discussion of how the outward forms of religious expression integrate with other cultural traditions. Recommended: College level reading and writing skills.

R 103 Religions of Eastern World
➢*(3 class hrs/wk, 3 cr) As needed*
Surveys cultures and religions of the eastern world with a focus on the teaching of compassion and tolerance in these religions. Includes understandings of Hinduism, Buddhism, Taoism, and Sikhism. Recommended: College level reading and writing skills.

R 198 Independent Studies: Research Topics
(1–3 class hrs/wk, 1–3 cr) As needed
Offers selected topics of study in religion with individual research and/or field study. Corequisite: WR 123 English Composition.

RD: READING

RD 090 College Success and Reading Strategies
(5 class hrs/wk, 5 cr) F/W/Sp/Su
Helps students make a successful transition into and through college. Combines reading, thinking and study strategies with personal skills needed for success in a community college. Study strategies include note taking, reading and studying textbooks, using critical thinking skills, and preparing for and taking tests. Personal success skills include taking personal responsibility and strengthening motivation, self-management and self-advocacy. Prerequisite: Appropriate placement on the reading portion of the CPT and placement into WR 090.

RD 115 Advanced College Reading and Learning Strategies
(4 class hrs/wk, 4 cr) F/W/Sp/Su
Develops the student's ability to comprehend, analyze and retain information from various disciplines. Students learn to become literate, active college students by developing academic strategies necessary for success in a community college or four-year college. Teaches skills for learning from lectures and textbooks, applying memory strategies, preparing for and taking tests, and managing student responsibilities. Prerequisite: CPT placement into WR 115 or successful completion of WR 095.

RD 120 Critical Thinking
(3 class hrs/wk, 3 cr) F/W/Sp/Su
Students improve the quality of their thinking by applying elements of reasoning and intellectual standards. In this skill-building course, students will critically evaluate complex issues from a variety of sources and develop lifelong critical thinking skills. Prerequisite: CPT placement into RD 115 or successful completion of RD 090. Recommended: CPT writing placement into WR 121 or successful completion of WR 115.

RT: DIAGNOSTIC IMAGING (RADIOLOGY TECHNOLOGY)

RT 5.750 Fundamentals of Diagnostic Imaging
(30 hrs, 3 cr) As needed
This course is designed to provide an overview of the foundations in radiography and the practitioner's role in the health care delivery system. Principles, practices, and policies of the health care organization(s) are examined and discussed in addition to the professional responsibilities of the radiographer. Content is designed to provide a fundamental background in ethics and cultural competence. The historical and philosophical bases of ethics, as well as the elements of ethical behavior, are discussed. The student will examine a variety of ethical issues and dilemmas found in clinical practice. An introduction to legal terminology, concepts and principles also will be presented. Topics include misconduct, malpractice, legal and professional standards, and the ASRT scope of practice. Critical thinking is incorporated in multiple content areas. Cultural competence is a theme throughout the course. Required: Admission into the Diagnostic Imaging Program.

RT 5.755 Radiographic Procedures – Chest/Abdomen
(40-42 hrs, 3 cr) As needed
Content is designed to provide the knowledge base necessary to perform standard imaging procedures. This course focuses on radiographic positioning and procedures for the chest and abdomen. Consideration is given to the evaluation of optimal diagnostic images. The lab portion includes peer positioning, film critique, anatomy, and the utilization of equipment to perform procedures on phantoms. Content is designed to provide a basis for analyzing radiographic images. Included are the importance of minimum imaging standards, discussion of a problem-solving technique for image evaluation, and the factors that can affect image quality. Required: Admission into the Diagnostic Imaging Program.

RT 5.756 Radiographic Procedures – Extremities and Spine
(66 hrs, 5 cr) As needed
Content is designed to provide the knowledge base necessary to perform standard imaging procedures. This course focuses on radiographic positioning and procedures for the extremities and spine. Consideration is given to the evaluation of optimal diagnostic images. The lab portion includes peer positioning, film critique, anatomy, and the utilization of equipment to perform procedures on phantoms. Content is designed to provide a basis for analyzing radiographic images. Included are the importance of minimum imaging standards, discussion of a problem-solving technique for image evaluation, and the factors that can affect image quality. Required: Admission into the Diagnostic Imaging Program.

RT 5.758 Radiographic Procedures – Skull and Review
(60 hrs, 4 cr) As needed
Content is designed to provide the knowledge base necessary to perform standard imaging procedures. This course focuses on radiographic positioning and procedures for the skull and other procedures. Consideration is given to the evaluation of optimal diagnostic images. The lab portion includes peer positioning, film critique, anatomy, and the utilization of equipment to perform procedures on phantoms. Content is designed to provide a basis for analyzing radiographic images. Included are the importance of minimum imaging standards, discussion of a problem-solving technique for image evaluation and the factors that can affect image quality. Required: Admission into the Diagnostic Imaging Program.

RT 5.759 Radiographic Procedures – Fluoroscopy
(33 hrs, 3 cr) As needed
Content is designed to provide the knowledge base necessary to perform standard imaging procedures. This course focuses on radiographic positioning and procedures for fluoroscopic examinations. Consideration is given to the evaluation of optimal diagnostic images. The lab portion includes peer positioning, film critique, anatomy, and the utilization of equipment to perform procedures on phantoms. Content is designed to provide a basis for analyzing radiographic images. Included are the importance of minimum imaging standards, discussion of a problem-solving technique for image evaluation and the factors that can affect image quality. Required: Admission into the Diagnostic Imaging Program.

RT 5.765 Clinical Radiography I
(244 hrs, 8 cr) As needed
Clinical practice experiences are designed for development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of radiologic procedures. The planned clinical experience provides the student with the opportunity to observe and apply theoretical principles while performing procedures under supervision of the clinical staff. Progression in the program is dependent on the student's demonstrating clinical competence on a specified number of competency evaluations. Required: Admission into the Diagnostic Imaging Program.

RT 5.766 Clinical Radiography II
(270 hrs, 10 cr) As needed
Clinical practice experiences are designed for development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of radiologic procedures. The planned clinical experience provides the student with the opportunity to observe and apply theoretical principles while performing procedures under supervision of the clinical staff. Progression in the program is dependent on the student's demonstrating clinical competence on a specified number of competency evaluations. Required: Admission into the Diagnostic Imaging Program.

RT 5.767 Clinical Radiography III
(330 hrs, 11 cr) As needed
Clinical practice experiences are designed for development, application, critical analysis, integration, synthesis and evaluation of concepts and theories in the performance of radiologic procedures. The planned clinical experience provides the student with the opportunity to observe and apply theoretical principles while performing procedures under supervision of the clinical staff. Progression in the program is dependent on the student's demonstrating clinical competence on a specified number of competency evaluations. Required: Admission into the Diagnostic Imaging Program.

RT 5.768 Clinical Radiography IV
(330 hrs, 11 cr) As needed
Clinical practice experiences are designed for development, application, critical analysis, integration, synthesis, and evaluation of concepts and theories in the performance of radiologic procedures. The planned clinical experience provides the student with the opportunity to observe and apply theoretical principles while performing procedures under supervision of the clinical staff. Progression in the program is dependent on the student's demonstrating clinical competence on a specified number of competency evaluations. Required: Admission into the Diagnostic Imaging Program.

RT 5.771 Exposure I
(30 hrs, 3 cr) As needed
Content is designed to establish a basic knowledge of atomic structure and terminology. The course also presents the nature and characteristics of radiation, X-ray production and the fundamentals of photons interactions with matter. The course is designed to establish a knowledge base in radiographic, fluoroscopic, mobile, and tomographic equipment requirements and design. Content is designed to impart an understanding of the components, principles,

and operation of digital imaging systems found in diagnostic radiology. Factors that impact image acquisition, display, archiving, and retrieval are discussed. Guidelines for selecting exposure factors and evaluation images within a digital system assist students to bridge between film-based and digital imaging systems. Required: Admission into the Diagnostic Imaging Program.

RT 5.772 Exposure II
(30 hrs, 3 cr) As needed
Content is designed to establish a knowledge base in factors that govern the image production process. Content is designed to establish a knowledge base in radiographic, fluoroscopic, mobile, and tomographic equipment requirements and design. The course is designed to impart an understanding of the components, principles, and operation of digital imaging systems found in diagnostic radiology. Factors that impact image acquisition, display, archiving, and retrieval are discussed. Guidelines for selecting exposure factors and evaluation images within a digital system help students bridge between film-based and digital imaging systems. Principles of digital system quality assurance and maintenance are presented. The content also provides a basic knowledge of quality control. Required: Admission into the Diagnostic Imaging Program.

RT 5.773 Exposure III
(20 hrs, 2 cr) As needed
Content is designed to impart an understanding of the components, principles, and operation of digital imaging systems found in diagnostic radiology. Factors that impact image acquisition, display, archiving, and retrieval are discussed. Guidelines for selecting exposure factors and evaluation images within a digital system help students bridge between film-based and digital imaging systems. Principles of digital system quality assurance and maintenance are presented. The content also provides a basic knowledge of quality control. Content is designed to establish a knowledge base in factors that govern the image production process. Content is designed to establish a knowledge base in radiographic, flouroscopic, mobile, and tomographic equipment requirements and design. Required: Admission into the Diagnostic Imaging Program.

RT 5.775 Patient Care in Radiologic Sciences
(24 hrs, 2 cr) As needed
Course is designed to provide the basic concepts of patient care, including consideration for the physical and psychological needs of the family. Routine and emergency patient care procedures will be described, as well as infection control procedures utilizing standard precautions. The role of the radiographer in patient education is identified. Required: Admission into the Diagnostic Imaging Program.

RT 5.777 Radiation Biology
(30 hrs, 3 cr) As needed
This course is designed to provide an overview of the principles of the interaction of radiation with living systems. Radiation effects on molecules, cells, tissues and the body as a whole are presented. Factors affecting biological response are presented, including acute and chronic effects of radiation. Required: Admission into the Diagnostic Imaging Program.

RT 5.779 Radiation Protection
(30 hrs, 3 cr) As needed
Course is designed to present an overview of the principles of radiation protection including the responsibilities of the radiographer, personnel and the public. Radiation health and safety requirements of federal and state regulatory agencies, accreditation agencies, and health care organizations will be addressed. Required: Admission into the Diagnostic Imaging Program.

RT 5.780 Basic Principles of Computed Tomography
(10 hrs, 1 cr) As needed
Prepares students to work with a health care team providing entry-level radiography students with the principles related to Computed Tomography (CT) imaging. Required: Admission into the Diagnostic Imaging Program.

RT 5.786 Radiographic Pathology
(30 hrs, 3 cr) As needed
Content is designed to introduce concepts related to disease and etiological considerations with emphasis on radiographic appearance of disease and impact on exposure factor selection. Required: Admission into the Diagnostic Imaging Program.

RT 5.796 Pharmacology for Imaging
(20 hrs, 2 cr) As needed
Content is designed to provide the basic concepts of pharmacology. Concepts of pharmacology including modes of action, uses, modes of excretion effects, side effects, and patient care required for specific pharmacologic agents. Required: Admission into the Radiologic Technology Program.

RT 5.798 Diagnostic Imaging Comprehensive Review I
(10 hrs, 1 cr) As needed
Prepares students to take the National ARRT examination. Allows a student to practice taking the exam using simulation tests. Introduces test-taking methods and skills, study skills, and memorization techniques. Reviews all pertinent program and course materials and education. Prepares students for graduation and the workforce. Required: Admission into the Diagnostic Imaging Program.

RT 5.799 Diagnostic Imaging Comprehensive Review II
(10 hrs, 1 cr) As needed
Prepares students to take the National ARRT examination. Allows a student to practice taking the exam using simulation tests. Introduces test-taking methods and skills, study skills, and memorization techniques. Reviews all pertinent program and course materials and education. Students learn to effectively communicate employability skills to a prospective employer upon completion of the national examination. Required: Admission into the Diagnostic Imaging Program.

SD: SUPERVISORY MANAGEMENT

SD 101 Supervision: Fundamentals
(3 class hrs/wk, 3 cr) F As needed
Introduces current management theory in the areas of motivation, leadership, organization and planning, team building, and decision making. Examines the skills necessary to be an effective supervisory leader within a diverse workplace.

SD 102 Supervision: Effective Communication
(3 class hrs/wk, 3 cr) W As needed
Focuses on the supervision skills that are used in effective communications in the workplace. Learn the basics of communication, including styles of communication, listening skills and non-verbal communication. In addition, learn meeting management and business presentation skills.

SD 103 Issues in Supervision
(3 class hrs/wk, 3 cr) Sp As needed
Covers employment law as it relates to supervision. Discusses sexual harassment, discrimination, affirmative action, drug and alcohol abuse, and compliance with the Americans with Disabilities Act. Covers the supervisor's responsibility for conservation and environmental issues within the workplace. Teaches tactics for dealing with these issues in an effective legal manner. Helps supervisors develop skillful interviewing and training techniques. Stresses two areas of interviewing – job interviews and employee appraisal interviews. Explores effective methods of training and direction personnel. Teaches effective coaching and disciplining skills. Emphasizes the skills needed for effective conflict management in the workplace.

SD 104 Supervision Skills
(3 class hrs/wk, 3 cr) As needed
A series of topics designed to improve a student's supervision skills. Study topics such as stress and time management, improving productivity in a changing environment and effective customer skills.

SD 107 Business and Society
(3 class hrs/wk, 3 cr) F/Sp
Study the basis of American business ethics. Compare and contrast western and non-western culture systems and examine the part culture plays in the formation of a nation's business values. Explore the relationships between business and contemporary society, including such topics as government regulation of business, business responsibility to consumers and the environment, and the role and responsibility of American business in the global community.

SD 280 CWE Supervisory Development
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to supervisory management. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

SOC: SOCIOLOGY

SOC 198 Research Topics
(1 class hr/wk, 1 cr) As needed
Requires an in-depth review of current knowledge about a sociological topic. Intended primarily for the sociology major to develop skills in independent research. Prerequisite: WR 123 English Composition.

SOC 204 Introduction to Sociology
■*(3 class hrs/wk, 3 cr) F/W/Sp*
Development and application of sociological concepts and perspectives concerning human groups; includes attention to socialization, culture, organization, stratification, and societies. Consideration of fundamental concepts and research methodology. Recommended: College level reading and writing skills.

SOC 205 Institutions and Social Change
■*(3 class hrs/wk, 3 cr) F/W/Sp*
Sociological study of the dynamic organizational nature of society through analysis of social change and major social institutions such as family, education, religion, the economy, and political systems. Prerequisite: SOC 204 Introduction to Sociology or instructor's approval.

SOC 206 Social Problems and Issues
■*(3 class hrs/wk, 3 cr) W/Sp*
Examination of social problems with particular focus upon U.S. society. Sociological perspectives on definition, description, and analysis of contemporary and recurrent problems in industrialized societies. Investigation of causes and consequences of social problems are considered In societal context. Prerequisite: SOC 204 Introduction to Sociology or instructor's approval.

SOC 222 Marriage Relationships
■*(3 class hrs/wk, 3 cr) F*
Examines intimate relationships, courtship, marriage and family patterns — old, new and unconventional. Focuses on how relationships are built, maintained, changed and terminated. Prerequisite: SOC 204 General Sociology or instructor's approval.

SOC 280 CWE Sociology
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to sociology. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. CWE coordinator's approval.

SOC 280S Service-Learning Sociology
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
An instructional program, using contextual learning, designed to promote critical thinking, citizenship and civic responsibility as students work with community partners in addressing real community needs. Students identify learning objectives, work a specified number of hours during the term, and engage in faculty-led guided reflection activities. Students must have taken or must be currently taking appropriate course or courses in their major field of study. They must also have their Service-Learning approved by the appropriate faculty coordinator.

SPN: SPANISH

SPN 101 First Year Spanish I
(4 class hrs/wk, 4 cr) F/W/Sp/Su
This class introduces basic structures of Spanish in order to help students communicate basic ideas and stresses all language skills (listening, speaking, reading and writing) through a communicative approach, as well as cultural topics. The class provides a general background of Hispanic populations, especially those largely represented in the U.S. This is not a conversation class, but there is an emphasis on oral communication. Conducted mainly in Spanish. Students with previous knowledge of the language are encouraged to take the placement examination.

SPN 102 First Year Spanish II
(4 class hrs/wk, 4 cr) F/W/Sp/Su
Continues to build language proficiency and introduce new grammar structures, particularly those used to communicate about past events. This class augments students' ability to deal with different practical situations in Spanish, and it explores the history and cultures of more Spanish speaking countries. Further development of all language skills and culture. Conducted in Spanish. Prerequisite: SPN 101 First Year Spanish I with a "C" or a higher grade, or take the placement examination, or obtain instructor's approval.

SPN 103 First Year Spanish III
(4 class hrs/wk, 4 cr) Sp/Su
Continues to build language proficiency and introduce new grammar structures. This class augments students' ability to successfully interact in more situations in Spanish, and explores the history and cultures of additional Spanish speaking countries. Further development of all language skills and culture. Conducted in Spanish. Prerequisite: Complete SPN 102 First Year Spanish II with a "C" or a higher grade, or take the placement examination, or obtain instructor's approval.

SPN 198 Independent Studies
(1–4 class hrs/wk, 1–4 cr) F/W/Sp
A special Spanish class tailored to improve writing skills in the language. Includes research in preparation for individual professional needs. Prerequisite: Instructor's approval.

SPN 201 Second Year Spanish I
➢*(4 class hrs/wk, 4 cr) F*
Review and further development of all language skills toward proficiency and cultural understanding. SPN 201 prepares students to use Spanish in more academic settings. All four main skills of the language are emphasized (reading, writing, speaking, and listening). Acquaints students with Hispanic cultures through authentic materials. There is an emphasis in presenting different cultural manifestations. Conducted in Spanish. Prerequisite: SPN 103 First Year Spanish III with a minimum "C" grade, or four years of high school Spanish equivalent, or instructor's approval. Native speakers are required to have instructor's approval.

SPN 202 Second Year Spanish II
➢*(4 class hrs/wk, 4 cr) W*
Further development of all language skills toward language proficiency and cultural understanding. Conducted in Spanish. Acquaints students with more complex grammar structures, and with Hispanic cultures through authentic materials. Prerequisite: SPN 201 Second Year Spanish I with a minimum "C" grade, or five years of high school Spanish equivalent or instructor's approval. Native speakers are required to have instructor's approval.

SPN 203 Second Year Spanish III
➢*(4 class hrs/wk, 4 cr) Sp*
Prepares students to use Spanish in more academic settings and use the language for critical and analytical purposes. Acquaints students with more complex grammar structures, and with Hispanic cultures through authentic materials. Conducted in Spanish. Prerequisite: SPN 202 Second Year Spanish II with a "C" grade or higher, or instructor's approval. Native speakers are required to have instructor's approval.

SPN 214 Spanish for Heritage Speakers I
(4 class hrs/wk, 4 cr) F
Part one of a three-course sequence designed specifically for the needs of Spanish heritage speakers. The main goal is to improve the students' reading, writing, grammar and speaking skills, while deepening their understanding and appreciation of Hispanic cultures in the world and within the United States. All classroom interaction occurs in Spanish. Prerequisite: Spanish native speaker or heritage speaker (grew up speaking Spanish at home).

SPN 215 Spanish for Heritage Speakers II
(4 class hrs/wk, 4 cr) W
Part two of a three-course sequence designed specifically for the needs of Spanish heritage speakers. The main goal is to improve the students' reading, writing, grammar and speaking skills, while deepening their understanding and appreciation of Hispanic cultures in the world and within the United States. All classroom interaction occurs in Spanish. Prerequisite: Spanish native speaker or heritage speaker (grew up speaking Spanish at home); completion of SPN 214 or instructor's approval.

SPN 216 Spanish for Heritage Speakers III
(4 class hrs/wk, 4 cr) Sp
Part three of a three-course sequence designed specifically for the needs of Spanish heritage speakers. The main goal is to improve the students' reading, writing, grammar and speaking skills, while deepening their understanding and appreciation of Hispanic cultures in the world and within the United States. All classroom interaction occurs in Spanish. Prerequisite: Spanish native speaker or heritage speaker (grew up speaking Spanish at home); completion of SPN 215 or instructor's approval.

SPN 280 CWE Spanish
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to Spanish. Students identify job performance objectives, work a specified number of hours during the term, and attend a CWE-related seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

SPN 280S Service-Learning Spanish
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
An instructional program, using contextual learning, designed to promote critical thinking, citizenship and civic responsibility as students work with community partners in addressing real community needs. Students identify learning objectives, work a specified number of hours during the term, and engage in faculty-led guided reflection activities. Prerequisites: Students must have taken or must be currently taking appropriate course or courses in their major field of study. They must also have their Service-Learning approved by the appropriate faculty coordinator.

SS: STUDY SKILLS

SS 070 Vocabulary Basics
(20 class hrs, 1 cr) F/W/Sp/Su
This self-paced minicourse is part of a comprehensive vocabulary program that helps students build vocabulary and strengthen their reading, writing and thinking. Features include an intensive words-in-context approach, abundant practice, individual feedback, and focus on high-frequency words and word parts known to be most helpful for students. Prerequisite: Townsend Reading Placement Test.

SS 071 Vocabulary Improvement I
(20 class hrs, 1 cr) F/W/Sp/Su
This self-paced minicourse is part of a comprehensive vocabulary program that helps students build vocabulary and strengthen their reading, writing and thinking. Features include an intensive words-in-context approach, abundant practice, individual feedback, and focus on high-frequency words and word parts known to be most helpful for students. Prerequisite: Townsend Reading Placement Test.

SS 072 Vocabulary Improvement II
(20 class hrs, 1 cr) F/W/Sp/Su
This self-paced minicourse is part of a comprehensive vocabulary program that helps students build vocabulary and strengthen their reading, writing and thinking. Features include an intensive words-in-context approach, abundant practice, individual feedback, and focus on high-frequency words and word parts known to be most helpful for students. Prerequisite: Townsend Reading Placement Test.

SS 073 Vocabulary Improvement III
(20 class hrs, 1 cr) F/W/Sp/Su
This self-paced minicourse is part of a comprehensive vocabulary program that helps students build vocabulary and strengthen their reading, writing and thinking. Features include an intensive words-in-context approach, abundant practice, individual feedback, and focus on high-frequency words and word parts known to be most helpful for students. Prerequisite: Townsend Reading Placement Test.

SS 074 Vocabulary Improvement IV
(20 class hrs, 1 cr) F/W/Sp/Su
This self-paced minicourse is part of a comprehensive vocabulary program that helps students build vocabulary and strengthen their reading, writing and thinking. Features include an intensive words-in-context approach, abundant practice, individual feedback, and focus on high-frequency words and word parts known to be most helpful for students. Prerequisite: Townsend Reading Placement Test.

SS 075 Vocabulary Improvement V
(20 class hrs, 1 cr) F/W/Sp/Su
This self-paced minicourse is part of a comprehensive vocabulary program that helps students build vocabulary and strengthen their reading, writing, and thinking. Features include an intensive words-in-context approach, abundant practice, individual feedback, and focus on high-frequency words and word parts known to be most helpful for students. Prerequisite: Townsend Reading Placement Test.

SS 087A Part I: Techniques of Studying Math
(10 class hrs, 1 cr) As needed
Develops study skills and college success skills. The course emphasizes study of the materials used in MTH 065A Part I: Elementary Algebra. Prerequisite: Adequate reading preparation for the materials being used. Co-enrollment in MTH 065A is required.

SS 087B Part II: Techniques of Studying Math
(10 class hrs, 1 cr) As needed
Develops study skills and college success skills. The course emphasizes study of the materials used in MTH 065B Part II: Elementary Algebra. Prerequisite: Adequate reading preparation for the materials being used. Co-enrollment in MTH 065B is required.

SS 1.181 Taking Lecture Notes
(20 class hrs, 1 cr) F/W/Sp/Su
In this self-paced, instructor-guided course, students develop effective note-taking skills. Students analyze their current skills and problem areas. Course includes pre-lecture preparation, effective listening techniques, identifying key information in a lecture, outlining skills, note-taking strategies, and the Cornell method of note taking and studying. Application activities reinforce concepts in each area.

SS 1.184 Studying for Tests
(20 class hrs, 1 cr) F/W/Sp/Su
In this self-paced, instructor-guided course, students develop strategies for test preparation. They learn how to anticipate course requirements, plan study time, and learn methods for identifying, organizing and actively learning the important information in a course. Included is study of mapping as a tool for learning course information.

SS 1.185 Test-taking Skills
(20 class hrs, 1 cr) F/W/Sp/Su
In this self-paced, instructor-guided course, students develop test-taking skills. They learn to anticipate why and when tests are given, evaluate their test-taking attitudes, develop successful test-taking strategies for objective and essay tests, learn post-test evaluation, and explore test anxiety and methods for managing it.

TA: THEATER

TA 110 Fundamentals of Technical Theater
(1 class hr/wk, 1cr) As needed
An overview of the basic principles and techniques of technical theater sub-disciplines such as stage design, lighting, sound, properties, costumes and stage management.

TA 139 Theater Artisan Skills (Pending State Approval)
(4 class hrs/wk, 3 cr) On demand
A lecture and laboratory focusing on the unique trade skills that theater artisans develop and use throughout their careers. This course will emphasize one specific trade skill each time it is offered, and those offerings will include puppetry and puppet-making, casting and molding techniques, history of décor, drafting, rigging, etc. The area of specialty will be given in the class schedule.

TA 140 Play Reading
(1 class hr/wk, 1 cr) As needed
The reading, discussion and examination of plays from world theater of the past and present from the prospective of production and theater history.

TA 145 Improvisation
(3 class hrs/wk, 3 cr) Sp
Introduction to the basic strategies of developing spontaneous responses and critical thinking skills to manage unexpected situations. Includes role playing and scene development tools for the performer.

TA 147 Introduction to Theater
(3 class hrs/wk, 3 cr) F/W/Sp
A comprehensive introduction to the art, history and workings of the theater. Students will be given a broad and general background in theater including production elements (lights, sound, sets, costumes, make-up, etc...) of acting, theater history and criticism. Students will attend live performances, view videos of plays and write reviews of live and filmed theater.

TA 150 Careers in Theater
(1 class hr/wk. 1 cr) As needed
A lecture/discussion course exploration of the many and varied career opportunities in the Theater to include the performance (on stage), technical (back stage) and managerial (front of house) sides of theater and how such preparation can lead to career openings in all areas of the performing arts.

TA 170 The Business of Theater
(1 class hr/wk. 1 cr) As needed
A lecture/discussion course on the varied skills and techniques of creating and maintaining the business operational side of a theatrical performance entity. An overview of the efficient operation of the economic resources at hand to audience development, underwriter angels plus developing possible grants and endowments.

TA 175 Portfolio Preparation
(1 class hr/wk, 1 cr) As needed
Exploration of the necessary photos, recordings, documentation and/ or renderings, drawings, and drafting necessary to prepare a portfolio for performers, designers and technicians in the performing arts.

TA 180 Rehearsal and Performance
(2–6 class hrs/wk, 1–3 cr) F/W/Sp/Su
Offers credit for participating in a public theater production of the college. Productions provide both extracurricular activity for non-majors and practical application of classroom theory for theater students. May be repeated for up to six credits. Instructor's approval required.

TA 190 Projects in Theater
(2-6 class hrs/wk, 1-3 cr) F/W/Sp/Su
Offers individually arranged projects in the theater. May be repeated for up to three credits. Instructor's approval required.

TA 198 Independent Studies: Theater
(2-6 class hrs/wk, 1-3 cr) F/W/Sp/Su
Offers individually arranged projects in the theater. May be repeated for up to three credits. Instructor's approval required.

TA 235 Theater Properties and Crafts (Pending State Approval)
(4 class hrs/wk, 3 cr) On demand
A workshop class focusing on the creation of theatrical properties and the basic craft skills commonly used in theatrical production. Projects will focus on materials and techniques used to create a variety of stage props and crafts. Included in course projects will be furniture, stage décor, masks, and special effects pieces.

TA 239 Scene and Lighting Design
(3 class hrs/wk, 3 cr) W
Lecture, discussion, and project-based class in which the process and fundamentals of scenic design and lighting design for theatrical production will be explored. Focus will be given to Theatrical Form and how it is used by the designer to enhance the theatrical production.

TA 240 Creative Drama for Classroom
(3 class hrs/wk, 3 cr) Sp
Demonstrates the skill of taking any lesson plan and turning it into an enjoyable, exciting and fulfilling experience for both the teacher and the student. Using simple strategies and a little creativity allows students to be completely engaged while they absorb the information from a lesson. This technique is typically characterized as creative drama for the classroom and has been proven to be an effective teaching tool.

TA 244 Stagecraft
(3 class hrs/wk, 3 cr) As needed
Introduces basic theater technology emphasizing the practical skills and crafts used in the performing arts which will include equipment, materials and techniques used in the scenic construction and mounting of a theatrical production. Prior experience not required or expected.

TA 245 Stage Lighting
(3 class hrs/wk, 3 cr) F
Fundamentals of electricity as used in stage lighting, color and light, lighting instruments and control systems including the theory and practice of lighting stage productions. Prerequisite: Completed or concurrently enrolled in TA 244 Stagecraft.

TA 247 Make Up
(3 class hrs/wk, 3 cr) As needed
Includes basic theory, techniques and practical laboratory experience of stage make up valuable to all individuals interested in working on stage or behind the scenes. Serves as an introductory experience for those interested in make up applications in film television and video production. Previous experience is not required.

TA 248 Fundamentals of Acting
(3 class hrs/wk, 3 cr) F
Designed for the beginning actor. Students will be introduced to the basics of stage acting through the use of games, exercises and improvisation. All of which, will support future character development within a scripted scene to be presented at the end of the course. Students will gain basic skills in acting, analyzing, improvisation, visualization, breathing, and relaxation as well as a working vocabulary of theater terms. For the non-theater major, he/she will recognize that the dynamic field of theater is a useful tool for communicating in any arena.

TA 249 Fundamentals of Acting II
(3 class hrs/wk, 3 cr) W
Prepares the student with practical knowledge and experience in character development, audition technique and play analysis. Prerequisite: TA 248 Fundamentals of Acting or TA 145 Improvisation or instructor approval.

TA 250 Workshop: Theater Arts
(2–6 class hrs/wk, 1–3 cr) F/W/Sp/Su
Offers practical experience in the preparation of scenery, costumes, properties, sound and publicity for a college theatrical production. May be repeated for up to six credits.

TA 264 Stage Management
(3 class hrs/wk, 3 cr) Sp
Managerial theory and practices of theater operations, including organizational structures, financial practices, program promotion and legal concerns.

TA 280 CWE: Theater
(3-42 class hrs/wk, 2-14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to performing arts. Students identify job performance objectives, work a specified number of hours during the term and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. CWE coordinator approval required.

TA 282 Production Performance
(2-6 class hrs/wk, 1-3cr)F/W/Sp/Su
Offers credit for participating in a public theater performance of the college. Productions provide both extracurricular activity for non-majors and practical application of classroom theory for theater students. May be repeated for up to three credits. Prerequisite: TA 180 Rehearsal and Performance or instructor's approval.

TA 290 Projects in Theater
(2-6 class hrs/wk, 1-3 cr) F/W/Sp/Su
Offers individually arranged projects in the theater. May be repeated for up to three credits. Prerequisite: TA 190 Projects in Theater or Instructor's permission.

TA 298 Independent Studies: Theater
(2-6 class hrs/wk, 1-3 cr) F/W/Sp/Su
Offers individually arranged projects in the theater. May be repeated for up to three credits. Prerequisite: TA 198 Independent Studies: Theater or Instructor's approval.

VT: VETERINARY ASSISTANT

VT 8.601 Foundation Sciences
(36 hrs, 3 cr) As needed
Provides students with knowledge and skills in basic biological sciences, including a knowledge of microbiology, virology, anatomy, physiology and parasitology.

VT 8.605 Veterinary Medicine
(78 hrs, 7 cr) As needed
Provides students with an understanding of common medical procedures and diseases of small and large animals. Students receive training and practice in nursing skills, knowledge of vaccines and standard protocols, foundation areas such as reproduction and nutrition, and specialized areas such as dentistry, cardiology, endocrinology and dermatology. Students gain skills relevant to these areas and current information regarding appropriate treatment methods.

VT 8.610 Veterinary Clinic Practices
(17 hrs, 1 cr) As needed
Students gain information regarding general medical and clinical procedures. They learn office-call procedures, medical terminology, basic business methods, interpersonal skills, and federal and state regulations specific to veterinary clinics.

VT 8.615 Clinical Sciences
(29 hrs, 2 cr) As needed
Helps students develop the knowledge and skills to perform clinical tasks relevant to veterinary clinics. In both the classroom and the laboratory, students perform clinical procedures such as intravenous catheterization, urinalysis, diagnostic cytology and complete blood counts.

VT 8.620 Surgery and Anesthesia
(43 hrs, 2 cr) As needed
Gives students the knowledge and skills necessary to perform the tasks associated with induction and maintenance of anesthesia, as well as those specific to surgery. Through lecture, demonstration and lab exercises, students learn to monitor planes of anesthesia, correct physiologic imbalances, and prepare materials essential to surgery.

VT 8.625 Veterinary Radiology
(20 hrs, 2 cr) As needed
Students gain a basic knowledge of the nature of radiation and how to take diagnostic-quality radiographs. Students acquire the necessary number of hours in education in veterinary radiation use and safety required by the Oregon Administrative rules. Upon completion of the course, students are radiation safety certified and therefore qualified to take radiographs at the completion of the section.

VT 8.630 Pharmacology
(20 hrs, 2 cr) As needed
Students gain a working knowledge of the commonly used drugs in veterinary medicine. This includes a knowledge of pharmacokinetics, drug classifications, indications and routes of administration, and the skills to calculate drug dosages.

VT 8.635 Alternative Medicine for Veterinary Technology
(1 class hr/wk, 1 cr) As needed
Introduces students to alternative therapies such as acupuncture, physical manipulation, therapeutic manipulation. Pain management medicine and multi-modal therapies are also covered. Prerequisite: MTH 060 and WR 115.

VT 8.640 Law and Ethics for Veterinary Technology
(1 class hr/wk, 1 cr) As needed
Covers the law and Oregon Administrative Rules pertaining to Veterinary Assistants and Technicians. It also presents ethical considerations typical in the practice of veterinary medicine. Prerequisite: MTH 060 and WR 115.

WD: WELDING

WD 4.151 Welding I
(4 class hrs/wk, 2 cr) F/W/Sp
Stresses safety and equipment familiarization, with lab exercises for skill development in basic gas and electric arc welding. Includes technical information lectures in related subjects.

WD 4.152 Welding II
(4 class hrs/wk, 2 cr) F/W/Sp
Provides welding skill level required in minor industrial applications. Includes more advanced electric arc-welding and an introduction to gas-shielded arc processes (MIG and TIG), as well as lab and technical information on related welding subjects. Prerequisite: WD 4.151 Welding I.

WD 4.154 Welding Seminar
(2-10 class hrs/wk, 1-10 cr) F/W/Sp
Open-entry/open-exit course providing skills upgrading.

WD 4.156 Machinery Operation and Maintenance
(3 class hrs/wk, 3 cr) Sp
A comprehensive study of the in-plant installation, operation and maintenance of manufacturing machinery. Includes safety, rigging, pumps, compressors, bearings, lubrication, motors with couplings, and clutches. Also includes machinery alignment and how it is accomplished. Prerequisite: Instructor's approval.

WD 4.157 Machinery Operation Essentials
(3 class hrs/wk, 3 cr) Sp
Introductory class to the mechanical aspects of manufacturing trades. Provides an overview of many important aspects a student will encounter entering into the industrial trades.

WD 4.160 Prep for Certification
(4 class hrs/wk, 2 cr) F/W/Sp
Designed to allow the individual who has achieved sufficient welding skill proficiency to prepare for applicable AWS Plate Welder Qualification tests and/or ASME Pipe Welder Qualification tests. The student may test during the course upon receiving the instructor's permission based on the instructor's evaluation of the student's demonstrated welding skill level, welding technique, weld quality and consistency. Testing is performed by an independent testing agency. Prerequisite: WD 4.152 Welding II or instructor's approval.

WD 4.240 Basic Arc Welding (SMAW)
(12 class hrs/wk, 6 cr) F
A beginning career course stressing safety and equipment familiarization, with lab exercises for skill development in basic fundamentals of electric arc welding (SMAW) process. Includes technical information lectures in related subjects. Prerequisite: WD 4.151 Welding I, previous welding classes or experience, or instructor's approval.

WD 4.241 Intermediate Arc Welding (GMAW and GTAW)
(12 class hrs/wk, 1–6 cr) W
A continuing career course stressing safety and equipment familiarization with lab exercises for skill development in the fundamentals of electric arc welding process. It includes technical information lectures in related subjects. The processes covered in this course are GMAW and GTAW. Prerequisite: WD 4.240 Basic Arc Welding or instructor's approval.

WD 4.242 Fabrication and Repair Practices I
(8 class hrs/wk, 4 cr) F
Introduces oxyacetylene welding and cutting practices on mild steel of various thicknesses and joint configurations in all positions. Covers basic fundamentals of fabrication and joint alignment.

WD 4.243 Fabrication and Repair Practices II
(8 class hrs/wk, 1–4 cr) W
Covers fundamentals of welding fabrication and repair. Introduces basic procedures in planning, sketching, cost evaluation, ordering, layout, metal preparation, tack-up and final welding. Prerequisite: WD 4.240 Basic Arc Welding, WD 4.242 Fabrication and Repair Practices I, WD 4.258 Basic Print Reading: Welders.

WD 4.245 Layout Procedures for Metals
(4 class hrs/wk, 3 cr) Sp
Introduces layout principles and applications. Tools and equipment for layout are studied in respect to their operating performance, with emphasis on maintenance. Includes planning and construction of templates, layout and specific fabrication to examine process quality. Prerequisites: WD 4.247 Interpreting Metal Fabrication Drawings, WD 4.258 Basic Print Reading: Welders, or instructor's approval.

WD 4.246 Advanced Arc Welding (SMAW and FCAW)
(12 class hrs/wk, 1–6 cr) Sp
Stresses safety and equipment familiarization with lab exercises for skill development in the fundamentals of electric arc welding SMAW and FCAW processes. It includes technical information lectures in related subjects and preparation for AWS welder's certification. Prerequisites: WD 4.240 Basic Arc Welding, WD 4.241 Intermediate Arc Welding or instructor's approval.

WD 4.247 Interpreting Metal Fabrication Drawings
(4 class hrs/wk, 3 cr) W
Introduces the principles of interpretation and application of industrial fabrication drawings. Basic principles and techniques of metal fabrication are introduced by planning and construction of fixtures used in fabrication from drawings. Basic tools and equipment for layout fitting of welded fabrications are utilized. Covers the use and application of the AWS welding symbols. Prerequisite: WD 4.258 Basic Print Reading: Welders.

WD 4.248 Basic Electricity For Welders
(4 class hrs/wk, 3 cr)
Learn the fundamental electrical maintenance and troubleshoot skills that are related to welding occupations: electrical safety including lock out tag out, power distribution, troubleshooting fuses and switches, circuits used in weld equipment, testing and connecting motors, current and voltage measurements, 12 volt DC systems, grounding, ground fault circuits, and when to get help.

WD 4.249 Basic Fluid Power For Welders
(4 class hrs/wk, 3 cr)
Learn the fundamental maintenance and troubleshoot skills related to fluid power in welding occupations: safety, maintenance of hydraulic and pneumatic systems, fundamental troubleshooting of systems, tracing systems, analyzing system schematics, mobile hydraulic systems, and air tool maintenance and safety.

WD 4.250 Fabrication and Repair Practices III
(8 class hrs/wk, 4 cr) Sp
Continues WD 4.243 Fabrication and Repair Practices II. Provides a more in-depth approach to welding design, fabrication and repair. Uses the principles and techniques of metal fabrication from drawings. Prerequisites: WD 4.241 Intermediate Arc Welding (GMAW and GTAW), WD 4.243 Fabrication and Repair II or instructor's approval.

WD 4.251 Fundamentals of Welding Inspection
(4 class hrs/wk, 3 cr) Sp
Covers general duties and responsibilities of the welding inspector, including the essential subject matter required to judge the quality of welded products to meet the requirement of specifications and code standards. Offers a comprehensive review of welding procedures, metallurgical considerations, materials control, weld defects testing, examination methods and inspection techniques. Prerequisite: Previous occupational/training experience with direct relationship to weldments, design production, construction-inspection or NDT testing.

WD 4.255 Fabrication of Structural Systems
(8 class hrs/wk, 4 cr) W
In this skill-building course, students gain advanced oxy-fuel cutting and fabrication skills using various structural materials and components. Includes applied mechanical blue print reading, cost estimating, ordering, inventorying materials, layout and final assembly. Prerequisites: WD 4.250 Fabrication and Repair Practices III, WD 4.152 Welding II, WD 4.258 Basic Print Reading, and WD 4.245 Layout Procedures for Welding, or instructor's approval.

WD 4.256 Basic Pipe Welding Skills
(8 class hrs/wk, 4 cr) F
Introduces and provides hands-on skill development in basic vertical-up open-v groove butt-joint pipe welding techniques on carbon steel pipe with the shielded metal arc welding and gas tungsten-arc welding (TIG) processes. Includes technical information lectures in related subjects. Prerequisite: WD 4.152 Welding II or instructor's approval.

WD 4.257 Fabrication and Repair: Applied Problem Solving
(8 class hrs/wk, 4 cr) Sp
Introduces students to the problem-solving process in many fabrication and repair of welded structures and piping system applications. Prerequisite: WD 4.255 Fabrication of Structural Systems.

WD 4.258 Basic Print Reading: Welders
(4 class hrs/wk, 3 cr) F
Introduces principles of welding fabrication drawings. Visualization of parts and projects, dimensioning and sketching are presented to develop the skills necessary to function in the fabrication and repair field and other related fields that require knowledge of prints.

WD 4.259 Advanced Fab Techniques
(4 hrs/wk, 3 cr) W
A course for 2nd year Welding Technology majors and individuals seeking additional advanced layout and fabrication skills beyond those offered in the prerequisite courses. Subject areas will include use of layout and fabrication tools, structural steel connections and components, chalk line layout, tank layout, ladder layout, stair layout, ring-flange layout, pipefitting fit-up, fall-protection, and rigging. Prerequisites: WD 4.246 Advanced Arc Welding, WD 4.250 Fabrication and Repair Practices III, WD 4.258 Basic Print Reading: Welders, WD4 .247 Interpreting Metal Fabrication Drawings, or instructor approval.

WD 4.260 Basic Wire-Feed Welding
(4 class hrs/wk, 2 cr) Sp
Provides the basic information and hands-on skills required to operate the MIG short arc (gas metal-arc welding short-circuiting metal transfer), MIG spray transfer (gas metal-arc welding spray transfer), and gas-shielded flux-cored arc welding processes on steel in the flat, horizontal, and vertical positions as applicable to each specific welding process. Technical information lectures include related subject areas such as basic machine set up and operation, process limitations, the welding machine wire-feeding mechanism, and required shielding gas types for the MIG short arc, MIG spray transfer, and gas-shielded flux-cored welding processes on steel. Prerequisite: WD 4.152 Welding II or instructor's approval.

WD 4.265 Print Reading and Welding Exploration
(4 class hrs/wk, 3 cr) F
Basic introduction of print reading and welding principles. In the area of blue print, the class will emphasize views, how and when they are used, and terms and symbols. In the area of welding, class emphasis will be on safety, the basics of oxy-acetylene process, shielded metal arc welding, and gas metal arc welding.

WD 4.270 Intro To Welding For Machinists
(2 class hrs/wk, 1 cr) Sp
Designed to allow the student the opportunity to develop the welding skills necessary to accomplish basic welding tasks typically encountered by the machinist in the workplace including the building up of worn surfaces for subsequent turning, milling, or other machining operations. Lecture and Lab topics will include safety, setup and operation of commonly-used welding processes, base metal weldability considerations, filler metal selection, and minimizing warpage and distortion.

WD 4.280 Aluminum Welding GTAW and GMAW
(4 class hrs/wk, 2 cr) W
Provides additional hands-on skill development with the Gas Tungsten-Arc Welding process on aluminum alloys beyond the introduction provided in prerequisite WD 4.152 Welding II. Also provides an introduction to the Gas Metal-Arc Welding process on aluminum alloys. Includes technical information lectures in related subject areas. Prerequisite: WD 4.152 Welding II or instructor's approval.

WE: COOPERATIVE WORK EXPERIENCE—CAREER EXPLORATION

WE 202 CWE Seminar
(1 class hr/wk, 1 cr) F/W/Sp/Su
The CWE seminar is a course designed to provide opportunities for students involved in a CWE course to share work-related experiences with their work experience coordinator. Note: May be repeated for up to four credits.

WE 280 Cooperative Work Experience – Career Exploration
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
An instructional program designed to give students practical experience in a supervised training position related to their career interest. Students identify learning objectives, work a specified number of hours during the term and participate in related seminar activities. Credits earned are based upon identified objectives and number of hours worked. Prerequisite: CWE coordinator approval.

WR: WRITING

WR 090 The Write Course
(4 class hrs/wk, 4 cr) F/W/Sp/Su
Introduces writing required for effective communication. Focuses on English conventions, writing sentences, and basic paragraph writing. Prerequisite: Computerized Placement Test score.

WR 095 College Writing Fundamentals
(4 class hrs/wk, 4 cr) F/W/Sp/Su
Prepares students to successfully use the writing process (plan, draft, revise, edit, proofread); use specific, sufficient, relevant support as evidence to support ideas; effectively use appropriate writer's resources; and edit and proofread for standard English and correct punctuation. Prerequisite: Successful completion of WR 090 the Write Course ("C" or better grade) or appropriate score on the Computerized Placement Test. Recommended: Reading CPT placement into RD 115 or co-registered in RD 90.

WR 115 Introduction to College Writing
(3 class hrs/wk, 3 cr) F/W/Sp/Su
Introduces college-level critical inquiry in academic and professional reading and writing. WR 115 students critically read, summarize, and respond in paragraph format. Students develop expository essay writing skills, review conventions, and use individual and collaborative processes. Note: This course does not satisfy institutional writing requirements for the degree seeking or transfer student. Prerequisite: Placement in WR 115 is determined by pre-enrollment testing (CPT) or by passing WR 095 with a grade of "C" or better. With an advisor's approval, students may challenge their mandatory placement by signing a self-placement form through their counselor.

WR 121 English Composition
(3 class hrs/wk, 3 cr) F/W/Sp/Su
Covers processes and fundamentals of writing expository essays, including structure, organization and development, diction and style, revision and editing, mechanics, and standard usage required for college-level writing. Placement determined by pre-enrollment testing (CPT). Prerequisite: Placement in WR 121 is determined by pre-enrollment testing (CPT) or by passing WR 115 with a grade of "C" or better. Students may challenge their mandatory placement, with an advisor's approval, by signing a self-placement form through their counselor.

WR 122 English Composition: Argumentation
(3 class hrs/wk, 3 cr) F/W/Sp/Su
Emphasizes the logical means of supporting claims in argumentative essays, thesis statements and reasoning. Includes logic, style and research. Prerequisite: WR 121 English Composition or equivalent.

WR 123 English Composition: Research
(3 class hrs/wk, 3 cr) W/Sp
Introduces informative and analytical writing supported by research. Students design a research plan, use primary and secondary sources critically, develop research methods, use proper documentation and develop writing strategies for longer papers. Prerequisite: WR 121 English Composition.

WR 185 Understanding English Grammar
(3 class hrs/wk, 3 cr) W
Explores the structure of the English language as well as its grammatical conventions. Students may then make grammatical choices realizing the rhetorical effects of those choices on the reader. This is not a remedial course. Prerequisite: WR 121 English Composition.

WR 227 Technical Writing
(3 class hrs/wk, 3 cr) F/W/Sp/Su
Introduces students to the types of writing they will encounter in business, industry, the academic world, and government. It examines the rhetorical nature of writing and asks students to think critically about content, audience, argument and structure. Students design, write and revise descriptions, job application documents (résumés and application letters), instructions, proposals, and formal technical reports. Prerequisite: WR 121 English Composition.

WR 240 Creative Writing Workshop: Nonfiction
➢ *(3 class hrs/wk, 3 cr) On demand*
Explores using creative writing techniques (plot, characterization, setting, metaphor, point of view, voice, etc.) in nonfiction essay writing. Emphasizes the elements of the creative process: personal reflective writing, creative drafting strategies, writing workshops, and revision. Note: May be repeated for up to six credits. Prerequisite: WR 121 English Composition.

WR 241 Creative Writing Workshop: Short Fiction
➢ *(3 class hrs/wk, 3 cr) F/W/Sp*
Applies elements of short fiction (dialogue, setting, character, conflict, etc.) using workshop sessions in which students discuss the exercises and stories of their classmates. Note: May be repeated for up to six credits. Prerequisite: WR 121 English Composition.

WR 242 Creative Writing Workshop: Poetry
➢ *(3 class hrs/wk, 3 cr) Sp*
Applies basic elements of poetry, types of poetry, uses for poetry and the process of creating poetry. Emphasizes fostering individual style. Note: May be repeated for up to six credits. Prerequisite: WR 121 English Composition.

WR 243 Creative Writing Workshop: Script Writing
➢ *(3 class hrs/wk, 3 cr) Sp*
Focus on writing and submitting scripts for class discussion and analysis. Studies established writers and film for techniques, structures and styles. Note: May be repeated for up to six credits. Prerequisite: WR 121 English Composition; ENG 110 Film Studies strongly recommended.

WR 280 CWE English/Writing
(6–42 class hrs/wk, 2–14 cr) F/W/Sp/Su
Gives students practical experience in supervised employment related to writing. Students identify job performance objectives, work a specified number of hours during the term, and attend a related CWE seminar. Note: Credits are based on identified objectives and number of hours worked. Prerequisite: CWE coordinator's approval.

WR 280S Service-Learning English/Writing
(3–42 class hrs/wk, 1–14 cr) F/W/Sp/Su
An instructional program, using contextual learning, designed to promote critical thinking, citizenship and civic responsibility as students work with community partners in addressing real community needs. Students identify learning objectives, work a specified number of hours during the term, and engage in faculty-led guided reflection activities. Prerequisites: Students must have taken or must be currently taking appropriate course or courses in their major field of study. They must also have their Service-Learning approved by the appropriate faculty coordinator.

WS: WOMEN'S STUDIES

WS 280 Global Women
(3 class hrs/wk, 3 cr) On demand
Focuses on women's experiences throughout the world and examines women's issues and status cross-culturally. Recommended: College level reading and writing skills.

WW: WATER WASTEWATER TECHNOLOGY

WW 6.154 Process Control I
(6 class hrs/wk, 4 cr) F
First course of a three-course series covering biological treatment process control. Designed for the student with a basic background in secondary biological treatment processes and some on-the-job experience. Common biological control strategies are covered with an emphasis on advanced operator control skills as they are related to these processes. Advanced techniques of process control are covered, including computer data handling, respirometry as control tool, etc. Prerequisite: WW 6.190 Introduction to Environmental Science and Technology, WW 6.191 Water Systems Operations, WW 6.192 Wastewater Systems, WW 6.168 In-Plant Practicum.

WW 6.155 Process Control II
(4 class hrs/wk, 3 cr) W
Second course in the three-course sequence on biological process control of municipal wastewater treatment facilities. Monitoring techniques and computer-aided data interpretation is continued for both suspended growth, attached growth, and combination treatment systems. Advanced control topics are covered, including filamentous bacteria identification and control, biological nitrogen removal, and biological phosphorus removal. Prerequisite: WW 6.154 Process Control I.

WW 6.156 Industrial Electricity
(4 class hrs/wk, 3 cr) F/W
Provides the student with a hands-on survey of electricity/electronics. Topics include DC and AC electricity, Ohm's Law, series and parallel circuits, electrical sources, semiconductor electronics and motors. The student will have an opportunity to construct various electrical circuits and test the electrical parameters associated with them, thereby confirming theoretical predictions and gaining knowledge in the proper use of electrical test equipment. Prerequisite: MTH 060 Introduction to Algebra or equivalent. Introduces basic DC electrical theory, safety, and multimeter use. Introduces single and three phase concepts and measurements. Prepares the student for basic electrical troubleshooting required in other industrial trades. Prerequisite: MTH 065 Elementary Algebra.

WW 6.164 Water Sources
(4 class hrs/wk, 3 cr) F
A basic class for students training to be water resource managers. Includes surface and groundwater sources. Covers hydrology, water quality, laws and regulations, flow measurements, storage, intake structures and wells.

WW 6.165 Water Distribution and Collection Systems
(2 class hrs/wk, 2 cr) Sp
Describes the management, operation and maintenance of water distribution and sewage collection systems.

WW 6.166 Water Purification Systems
(5 class hrs/wk, 4 cr) F
An advanced-level course designed to cover the theory, application and operation of potable water treatment systems. Theory, evaluation, and operation of mixing systems, coagulation chemistry, optimization of chemical applications, flocculation, sedimentation and filtration are the focus of this course. A major focus of this class is the evaluation of treatment systems. Prerequisite: WW 6.190 Introduction to Environmental Science and Technology, WW 6.191 Water Systems Operation, WW 6.192 Wastewater Systems, and WW 6.168 In Plant Practicum.

WW 6.167 Water Distribution and Collection Lab
(2 class hrs/wk, 1 cr) Sp
This laboratory course is designed to parallel the topics covered in WW 6.165 Water Distribution and Collection Systems. Covers the description and describes the application of materials and design practices used in the construction of roads, water distribution systems and sewage collection systems. Prerequisite: MTH 095 Intermediate Algebra.

WW 6.168 In-Plant Practicum
(40 class hrs/wk, 2–12 cr) Su
Consists of full-time work in a water or wastewater treatment facility. Skills and knowledge developed in first-year courses are combined with on-the-job training by both plant supervisory personnel and LBCC visiting instructors. Prerequisites: WW 6.190 Introduction to Environmental Science and Technology, WW 6.191 Water Systems Operations, WW 6.192 Wastewater Systems, WW 6.193 Introduction to Aquatic Chemistry and Microbiology, WW 6.195 Intermediate Aquatic Chemistry and Microbiology, HE 112 Emergency First Aid or HE 252 First Aid, and instructor's approval.

WW 6.181 Water/Wastewater Mechanics
(4 class hrs/wk, 3 cr) Sp
Covers the specific equipment and mechanical skills required in the water and wastewater treatment industry. Topics include blueprint reading, valves and hydrants, backflow devices, positive displacement pumps, centrifugal pumps, chlorinators, and other applied equipment.

WW 6.190 Introduction to Environmental Science and Technology
(7 class hrs/wk, 6 cr) F
Introduces students to field of environmental science, pollution control, and environmental technology. Provides the basic understandings of the normal ecology of the planet and the risks associated with pollution of our environment. Sources of environmental pollution and control technologies including safe drinking water, wastewater treatment, air pollution, solid waste, and hazardous waste management. Prerequisite: Enrollment in Water/Wastewater Technology. Corequisites: WW 6.193 Intro to Aquatic Chemistry and Microbiology, MTH 060 Introduction to Algebra, and WR 115 Introduction to College Writing.

WW 6.191 Water Systems Operation
(12 class hrs/wk, 7 cr) Sp
Develops the basic understanding and required skills for operation of a water treatment system including surface and groundwater sources, raw water storage and pretreatment, coagulation, flocculation, sedimentation, filtration, disinfection, fluoridation, softening corrosion control, membrane processes, finished water storage, water distribution and safety procedures in the workplace. Prerequisites: WW 6.190 Introduction to Environmental Science and Technology. Corequisite: MTH 065 Elementary Algebra and WW 6.195 Intermediate Aquatic Chemistry and Microbiology.

WW 6.192 Wastewater Systems
(12 class hrs/wk, 7 cr) W
Covers all the common wastewater treatment processes starting with the wastewater collection system, pretreatment, and primary treatment sections of the plant through the biological secondary treatment steps and ending with selected solids handling procedures. Each treatment alternative is covered with the basic physical/biological concepts of the process and the direct operator skills and activities required for successful operation. Observation, laboratory testing, safety and calculation interpretation are used as monitoring tools in this course. Prerequisite: WW 6.190 Introduction to Environmental Science. Corequisite: MTH 065 Elementary Algebra and WW 6.194 Basic Aquatic Chemistry and Microbiology.

WW 6.193 Introduction to Aquatic Chemistry and Microbiology
(7 class hrs/wk, 4 cr) F
The first in a sequence of three chemistry and microbiology courses for water and wastewater technology students. This course covers general chemistry and microbiology skills and concepts that are applied in the second and third courses in the year-long sequence. Laboratory activities cover lab safety and basic lab skills.

WW 6.194 Basic Aquatic Chemistry and Microbiology
(7 class hrs/wk, 4 cr) W
A continuation of WW 6.193 Introduction to Aquatic Chemistry and Microbiology. Covers basic concepts relevant to wastewater treatment and applies them to common wastewater laboratory techniques (e.g. the BOD test, solids tests, microscopic identification, MPN). Prerequisite: WW 6.193 Introduction to Aquatic Chemistry and Microbiology or instructor's approval.

WW 6.195 Intermediate Aquatic Chemistry and Microbiology
(7 class hrs/wk, 4 cr) Sp
Continuation of WW 6.194 Basic Aquatic Chemistry and Microbiology. Covers basic concepts relevant to drinking water treatment and applies them to common laboratory techniques (e.g. alkalinity, hardness, turbidity, jar test, PA test, chlorine residual). Prerequisite: WW 6.194 Basic Aquatic Chemistry and Microbiology or instructor's approval.

WW 6.197 Solids Handling
(2–4 class hrs/wk, 3 cr) Sp
Designed to cover the standard procedures and processes of solids handling and residuals management. Selected topics to be covered will include chemical addition for sludge conditioning, sludge thickening processes, sludge digestion, mechanical dewatering, composting, land application practices, and related lab procedures. Prerequisite: WW 6.155 Process Control II.

WW 6.198 Instrumentation
(5 class hrs/wk, 4 cr) Sp
Provides an introduction to the instrumentation processes used to monitor and control contemporary water and wastewater treatment facilities. Measurement of temperature, pressure, liquid level and flow, and the transmission and control of these parameters will be discussed. Prerequisite: WW 6.156 Industrial Electricity.

WW 6.199 Introduction to Hydraulics
(3 class hrs/wk, 2 cr) F
Provides an introduction to hydraulics for water/wastewater treatment plant operators. Includes performing basic hydraulic computations, hydraulic measurement units, pressure, head, head loss, flow and pump calculations. Corequisite: MTH 060 Introduction to Algebra.

WW 6.235 Applied Hydraulics
(3 class hrs/wk, 3 cr) W
A practical course covering flow, head and head loss calculations, pump calculations and pump curves. Applications are made to water distribution systems and sewage collection systems. Corequisite: MTH 095 Intermediate Algebra.

LBCC's Alcohol- and Drug-Free Program

As one part of its Alcohol- and Drug-free (Workplace/School) Program, Linn-Benton Community College has developed a brochure to provide students and staff information about the health risks associated with the use of illegal drugs and abuse of alcohol. It also includes standards of conduct required of students and staff, LBCC sanctions, legal sanctions, and counseling and treatment resources available in the area. This document has been printed here in abbreviated form. To obtain the full-text document, contact LBCC's Human Resources Office, 541-917-4420, or view online at *www.linnbenton.edu/go/about-lbcc policies/drugfree.*

I. Introduction

Linn-Benton Community College is legally required and morally committed to the prevention of illicit drug use and the abuse of alcohol by both students and employees. Drug and alcohol abuse is a significant public health problem which has spread throughout our society, affecting performance and productivity, as well as our level of general health. In addition, the use of drugs can adversely affect an organization's level of safety as well as its public confidence and trust. In brief, this section has been developed by LBCC to comply with the federal law and to educate and inform its students and employees of the health risks, counseling and treatment resources, and sanctions for noncompliance. Linn-Benton will biennially review this program to determine its effectiveness and implement changes if needed and to ensure that the sanctions required are consistently enforced.

II. Standards of Conduct

Students

The LBCC *Student Rights, Responsibilities & Conduct* document (page 6, number 14) defines the following behaviors as violations of the standards of student conduct: "use, possession, or distribution of alcoholic beverages, narcotics, or dangerous drugs except as expressly permitted by law." The document may be viewed online at www.linnbenton.edu/go/studentrights.

Employees

In compliance with the Drug-Free Workplace Act of 1988 and the Drug-Free Schools and Communities Act Amendment of 1989 (Public Law 101-226), it shall be the policy of Linn-Benton Community College to maintain an alcohol and drug-free workplace for all employees of the District. The unlawful manufacture, distribution, dispension, possession or use of alcohol or a controlled substance, except by physician's prescription, is strictly prohibited in the workplace(s) of the Linn-Benton Community College District.

III. A Description of the Health Risks Associated with the Use of Illicit Drugs and the Abuse of Alcohol

Illicit Drugs

Marijuana is addictive and can cause impaired short-term memory, visual tracking, heart rate, slowed reaction time/poor coordination, lung disease and damage to reproductive functions.

Cocaine and Crack are highly addictive and may cause impaired judgment, short attention span, irritability, depression, mood swings, malnutrition, severe weight loss and liver damage, coma, seizure and heart attack.

PCP, LSD, Heroin, Mescaline and Morphine have a wide variety of negative health effects which may include hallucinations, mental confusion and/or permanent loss of mental function, addiction, convulsions, coma, death.

Prescription Drugs are too often used to reduce stress and are not safe unless they are taken as prescribed. If abused, they can lead to malnutrition, sluggishness or hyperactivity, impaired reflexes, addiction and brain damage, coma, death.

Alcohol is the most commonly abused drug and can cause loss of concentration, poor judgment and coordination, impaired memory, drowsiness and mood swings, liver damage/cirrhosis of the liver, high blood pressure and heart attack, pancreatitis, various cancers, heart disease.

IV. A Description of the Applicable Legal Sanctions under Local, State, and Federal Law for Unlawful Possession, Use, or Distribution of Illicit Drugs and Alcohol

The following chart describes the penalties in general for possession of key drugs according to the Federal Drug Schedules.

	Maximum Prison Time	Maximum Fine
Schedule I – Class B Felony Heroin, LSD, other hallucinogens, marijuana, others	10 years	$100,000
Schedule II – Class C Felony Methadone, morphine, amphetamine, cocaine, PCP	5 years	$100,000
Schedule III – Class A Misdemeanor Non-amphetamine stimulants, some depressants	1 year	$2,500
Schedule IV – Class C Misdemeanor Valium-type tranquilizers, some less potent depressants	30 days	$500
Schedule V – Violation Dilute mixtures, compounds with small amounts of controlled drugs	no maximum	$1,000

Delivery of less than five grams or possession of less than one ounce of marijuana is a violation. HB 2479 established mandatory evaluation, education and treatment services for those under 18 years of age. If services are successfully completed, the charge will be dropped. Oregon has strong laws allowing cars, boats, etc. that transport illegal drugs to be seized and forfeited. Alcohol is an illegal drug for those under 21 years of age. For drivers under 18, ANY detectable amount of alcohol (above .00 BAC) is grounds for losing their license until they are 18. There are many more laws pertaining to alcohol and other drugs. This is a sample to demonstrate that most drugs are VERY illegal, and a criminal conviction may bar a student from their chosen career path or an employee from successful employment with the college.

V. LBCC Sanctions

Students

Sanctions which may be imposed on students for violations of the code include *disciplinary warning, disciplinary probation* (a written warning by the dean of student services or college president), *temporary exclusion* (removal for up to two class periods or longer), *suspension* (exclusion from classes and activities and/or forfeiture of the right to enter the campus, *expulsion* (termination of student status), and others.

Employees

The college will impose sanctions or require satisfactory completion of a drug abuse assistance or rehabilitation program. Sanctions imposed may include *disciplinary probation* (the suspension of a more severe penalty for a specific time period, based upon good behavior), *suspension* (the temporary barring from employment for a specific time period, without pay), and/or *termination* (the severance of employment with the college).

VI. Assistance Programs Available to Students and Employees

Benton County Alcohol and Drug Treatment Program 541-766-6835
Linn County Alcohol and Drug Treatment Program 541-967- 3819
Alcoholics Anonymous, Linn & Benton counties 541-766-3677
Ala-Non, Linn & Benton counties 541-967-6262
Community Outreach/ASSETS 541-758-3000
Drug & Alcohol Abuse Hotline 1-800-621-1646
Milestones Family Recovery Program, Corvallis 541-753-2230
Narcotics Anonymous Helpline 1-877-233-4287
Serenity Lane, Albany 541-928-9681
Teen Challenge, Inc. 1-503-585-6278

College Resources for Students:
Counseling Center, Takena Hall 541-917-4780

College Resources for Employees:
LBCC provides an Employee Assistance Program (EAP), available to all contracted employees. Through this program, each employee and his or her dependents are allowed five visits per year at no cost for appraisal, limited counseling and/or referral. All employee contact with EAP is **strictly confidential.** Phone numbers for EAP include: (800-922-7009; Corvallis (541-754-8004) or Eugene (541-344-6929).