COURSE DESCRIPTIONS

Course descriptions are organized alphabetically by discipline or program name. The descriptions contain several sets of capital letter codes. The code or name of a semester after the course title indicates when a course is normally offered, for example, during fall or spring semester. Following are the codes used:

F&S - Fall and Spring
EO - Evenings Only
BD - By Demand
SM - Summer Session

ACADEMIC SKILLS COURSES (ASC)

The following Academic Skills Courses (ASC) are pre-college courses that will prepare students for college level work. The credits awarded are NOT college credits.

ASC 076 Applied Study Skills Fall 1 credit

An embedded study skills application for specific content areas. Learning and study strategies will be presented and applied using students' texts and classroom assignments. Instruction includes handouts, study guides, cooperative and individualized learning, and computer instruction.

ASC 082 Effective Reading F&S SM 2 credits

This course provides strategies to help students increase reading efficiency, comprehension, and vocabulary in order to meet the demands of college level reading. Students will select, read, write, and critically evaluate a variety of written material to improve their reading skills and increase their enjoyment of reading. Students with ACT reading scores of 0-14 or COMPASS reading scores of 0-67 should take this course.

ASC 087 College Writing Preparation F&S SM 3 credits

To succeed in college and beyond, today's students must be able to read, think critically, interpret, react to what they have read, and express their ideas clearly and correctly in written form. This course helps students gain confidence in their writing and thinking skills and bring their writing proficiency up to an acceptable college level. Elements of effective writing are covered to include strategy, organization, style, sentence structure, grammar and usage, and punctuation. Students with ACT English scores of 0-14 or COMPASS 0-42 are required to take this class before taking English 110.

ASC 088 Composition Lab F&S SM 1 credit

Composition Lab is designed as a co-requisite with English 110 for students who demonstrate a need for support instruction in grammar and punctuation based on their placement scores. Students will gain confidence in their editing skills, reduce mechanical errors in their writing, and be able to focus more attention on the craft of thoughtful writing. The course is offered on-campus or online. Students who are required to take ASC 088 must pass the lab in order to pass English 110. Placement is based on the following:

ACT (English)	COMPASS (English)	Course
0-14	0-42	ASC 087 College Writing Prep
15-17	43-67	ENGL 110 +ASC 088 (Composition Lab on-campus or online)
18-36	68-100	ENGL 110 (no Composition Lab required)
ACT 22 or COMPASS 86 required for current high school students taking ENGL 110		

ASC 092 Beginning Algebra F&S SM 3 credits

Fundamental skills in mathematics beginning with basic arithmetic and proceeding to elementary algebra. Designed for those students with little or no mathematics background who wish to prepare for future study in mathematics. Will not satisfy the mathematics/science/technology requirements at BSC and will not be accepted for credit at transfer institutions.

MATH 102 Intermediate Algebra F&S SM 3 credits

Prerequisite: ASC 092, or qualifying ACT or COMPASS score.
Review of basic algebra concepts including signed numbers, linear equations and inequalities, operations with algebraic fractions, exponents, radicals, systems of equations and inequalities, and the quadratic formula. Will not satisfy the mathematics/science/technology requirements at BSC and will not be accepted for credit at transfer institutions. **It is expected that Spring 2012 will be the last session or semester that Math 102 will be offered. Alternate courses are in development. Contact your advisor for more information.**

ASC 098 Basic Biology BD 3 credits

The study of Basic Biology 098 is intended to help those students without sufficient background in biology and chemistry to be successful in General Biology 150, Introductory Microbiology 202 or Anatomy & Physiology 220. Selected topics will include: chemistry as required to comprehend biology, basic cellular concepts, and human body systems and their functions. Concurrent registration in or previous successful completion of ASC 098L is required.

ASC 098L Basic Biology Lab BD 1 credit

Basic Biology 098 Lab is intended to help familiarize students with techniques and equipment necessary to be competent in the laboratory. Lab work will focus on introducing students to the process of scientific investigation, the use and care of the microscope, basic biological concepts, and the structure and function of the human body. Concurrent registration in or previous successful completion of ASC 098 lecture is required.

ACCOUNTING (ACCT)

ACCT 102 Fundamentals of Accounting F&S 3 credits

Begins with an overview of the accounting process then covers computerized accounting procedures, accounting cycle, financial statements, cash, voucher systems and controls, notes and interest, deferrals and accruals, receivables and temporary investments, and inventories using a fully integrated accounting software package. This course will not fulfill the accounting requirement for accounting and/or business administration majors.

ACCT 200 Elements of Accounting I F&S SM 3 credits

Covers accounting procedures, accounting cycle, financial statements, deferrals and accruals, cash, receivables and temporary investments, inventories, plant and intangible assets, current liabilities (including payroll and taxes), and a practice set. Primary focus is on service and merchandise businesses using a sole proprietor form of entity.

ACCT 201 Elements of Accounting II F&S SM 3 credits

Covers accounting procedures, corporate entities, transactions involving stocks, bonds, and dividends, consolidated statements, financial statement analysis, annual reports, statements of cash flows, an introduction to managerial accounting using job order and process cost systems, budgeting and a practice set. Prerequisite: Accounting 200.

ACCT 215 Business in the Legal Environment
Spring 3 credits

This course, taught by a local attorney, is a study of the nature, formation, and application of law in general, with emphasis on public law and the regulation of business.

ACCT 218 Computer Applications in Business
F&S 3 credits

A study of accounting applications using computers, including programs on accounts receivable, accounts payable, payroll and inventories. This course is taught using software currently used in the business working environment. This course will not fulfill the accounting requirement for accounting and/or business administration majors. Prerequisite ACCT 102 or 200.

ACCT 225 Business Law I F&S 3 credits

This course, taught by a local attorney, covers introduction to law, contracts, agency, employment, and negotiable instruments.

ACCT 231 Income Tax Procedure Spring 3 credits

A course dealing with the basic principles of federal income tax with the application and interpretation of the Internal Revenue Code to problems relating to individuals.

ACCT 294 Independent Study BD 1-3 credits

Independent or directed study of special topics in Accounting. Department chairperson approval required.

ACCT 299 Special Topics BD 1-3 credits

Repeatable up to six semester hours. An examination of special topics in accounting.

ACCT 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum. .

ACCT 197-297 Cooperative Education/ Internship
F&S SM 1-3 credits

Repeatable up to a maximum of 6 hrs. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

AGRICULTURE (AGEC, AGRI, ANSC, ASM, H&CE, PLSC, SOIL, VETS)

AGRICULTURAL ECONOMICS (AGEC)

AGEC 141 Introduction to Agribusiness Management
Spring 2 credits

This is an introductory course dealing with the economic importance of the agribusiness community and the potential for employment with the agribusiness industry.

AGEC 142 Agricultural Accounting Fall 3 credits

An introduction to the preparation of farm records and financial statements for use in business analysis.

AGEC 242 Introduction to Agricultural Management
Fall 4 credits

Economic and managerial concepts related to farm or agribusiness production process, development of cost data, enterprise analysis, organization and management of production inputs.

AGEC 244 Introduction to Agricultural Marketing
Spring 3 credits

A study of the agricultural marketing system to include cash marketing, commodity futures trading, branded products merchandising and the interrelationship of the government and international trade.

AGEC 246 Introduction to Agricultural Finance
Spring 3 credits

Introduction to agricultural finance; provides background in farm and agribusiness credit use and evaluation. Discussion of specific financial conditions on farms and in agribusiness.

AGEC 250 AgriSales Spring 3 credits

The principles of salesmanship applied to the agricultural business. Topics include attitudes and value systems, basic behavioral patterns, relationship of sales to marketing, selling strategies, preparing for sales calls, making sales presentations, and closing sales.

AGRICULTURE (AGRI)

AGRI 191 First Year Seminar Fall 2 credit

This course is designed to address selected topics in agriculture.

AGRI 241 Farm Management Education
F&S 2 credit hours repeatable

The Farm Management Education program provides a practical study of the farming business for farm families currently engaged in managing their farms or ranches. Three semesters of enrollment per year.

AGRI 242 Advanced Farm Management Education
F&S 2 credit hours repeatable

Prerequisite: Agri 241 or department approval. This course continues the application of farm management principles for decision making. Fall and spring enrollment only. Requirements - 3 years of AGRI 241 or a degree in Agriculture.

AGRI 275 Introduction to Precision Farming
Fall 3 credits

This course is designed to introduce the student to precision farming applications. Students will receive hands-on training using handheld global positioning systems, differential global positioning systems and GIS software.

AGRI 285 Precision Agriculture Systems-Software
Spring 2 credits

This course introduces various precision farming software in real-world applications. Discussion of how geographic information systems (GIS) can be used to input and store data, assist in the analysis of data and create interpretive maps. It focuses on initial setup of software, data management and evaluation, saving and unloading data cards, processing field data, and compiling prescription application maps. Prerequisite: AGRI 275.

AGRI 291 Second Year Seminar Fall 2 credit

This course is designed to address selected topics in agriculture.

AGRI 294 Independent Study 1-3 credits
Independent or directed study of special topics in agribusiness. Department chairperson approval required.

AGRI 299 Special Topics BD
Variable 1-3 credits
Variable instructional topics in the field of agriculture. Repeatable with varied content. Consent of department chairperson.

AGRI 195-295 Service Learning F&S 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods. Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum

AGRI 197-297 Cooperative Education/Internship
1-3 credits
repeatable up to 6 semester hours
Students get on-the-job experience under qualified supervision in agribusiness occupations. Work hours are arranged by the employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student-advisor conferences are held to discuss progress and/or problems. All co-op experiences are graded on a satisfactory/unsatisfactory basis. Consent of department chairperson.

ANIMAL SCIENCE (ANSC)

ANSC 114 Introduction to Animal Sciences
F&S 2 credits
General principles of the livestock industry and relationship to mankind. Concurrent registration in or previous successful completion of ANSC 114L is required.

ANSC 114L Introduction to Animal Sciences Lab
Fall 1 credit
Concurrent registration in or previous successful completion of ANSC 114 is required.

ANSC 123 Feeds and Feeding Spring 2 credits
Principles of feeding livestock including digestive systems, nutrient requirements, nutrient characteristics, and sources utilized in the formulation of balanced rations. Concurrent registration in or previous successful completion of ANSC 123L is required.

ANSC 123L Feeds and Feeding Lab Spring 1 credit
Concurrent registration in or previous successful completion of ANSC 123 is required.

ANSC 220 Livestock Production Spring 2 credits
General production and management of major meat animal species. Topics include: production systems, feeding, facilities, health, economics, and marketing. Concurrent registration in or previous successful completion of ANSC 220L is required.

ANSC 220L Livestock Production Lab
Spring 1 credit
Concurrent registration in or previous successful completion of ANSC 220 is required.

ANSC 252 Large Ruminant Production
Spring 2 credits
Large ruminant production will explore common production practices of beef and dairy in the upper Midwest. A focus of the class will be making production decisions based on profitability and efficiency.

AGRICULTURAL SYSTEMS MANAGEMENT (ASM)

ASM 130 Agriculture Industry Machinery Operations
Spring 2 credits
Operation of skid and oscillating loaders, fork lifts, tractors, trucks, trailers, agriculture application equipment and other agribusiness equipment. Students prepare for commercial driver's license. Defensive driving taught. Equipment lease service fee.

ASM 155 Agricultural Welding Spring 3 credits
Principles and operation of oxyacetylene, electrode, and wire feed welding.

ASM 175 Agriculture Industry Skills
Fall 3 credits
The purpose of this course is to provide students the basic fundamentals and applications of agriculture industry skills in electricity, plumbing, selecting and using hardware, measurement, and structures.

HUMAN AND COMMUNITY EDUCATION (H&CE)

H&CE 241 Leadership & Presentation Techniques
Fall 2 credits
Development of youth leadership professionals in educational settings; methods, principles, and practices in organizing, developing, conducting, and evaluating community-based student organizations and student leadership programs.

H&CE 281 Early Experience F&S 1 credits
Field-based experience in a middle or high school educational setting. Provides an opportunity to observe and interact with students, teachers, and administrators.

PLANT SCIENCE (PLSC)

PLSC 110 World Food Crops Fall 2 credits
Scientific principles of crop growth, worldwide production, management alternatives, and processing for domestic and international consumption. AAS-MST. Concurrent registration in or previous successful completion PLSC 110L is required.

PLSC 110L World Food Crops Lab Fall 1 credit
Concurrent registration in or previous successful completion of PLSC 110 is required.

PLSC 223 Introduction to Weed Science
Spring 2 credits
Introduction of a basic knowledge of weeds, herbicide groups, the use of pesticides, economic and environmental considerations, personal safety, modes of action and terminology.. Concurrent registration in or previous successful completion PLSC 223L is required.

PLSC 223L Introduction to Weed Science Lab
Spring 1 credit
Concurrent registration in or previous successful completion of PLSC 223 is required.

PLSC 225 Principles of Crop Production
Spring 3 credits
Principles of field crop production with emphasis on relationships of crops to their climate and production considerations as a means of managing resources and the environment.

PLSC 235 Field Scouting Techniques
Spring 2 credit

The purpose of this course is to provide students the skills necessary for proper pest identification and crop scouting techniques. Information such as crop growth and development, pest life cycles, damage symptoms and economic thresholds will be covered. Communications skills and presentation techniques will also be emphasized.

PLSC 235L Field Scouting Techniques Lab
Summer 1 credit

Repeatable up to four times. Field scouting activities will be done in the field at various locations throughout the summer to give the student practical field experience. Prerequisite: PLSC 235.

PLSC 243 Advanced Weed Science
Fall 2 credits

Interpretation and understanding of herbicide mode of action, herbicide resistance, herbicide efficacy, herbicide toxicology, herbicide selectivity, and characteristics of weeds. Prerequisite: PLSC 223/223L.

PLSC 245 Advanced Crop Production
Spring 2 credits

This is an advanced examination of crop production principles: nutrient management, soil and water management, integrated pest management, and crop management. Prerequisite: Completion of PLSC 225 Principles of Crop Production or instructor approval.

RANGE SCIENCE (RNG)

RNG 236 Introduction to Range Management
Fall 3 credits

Principles of range management, which include plant identification, range evaluation, and range improvement.

SOIL (SOIL)

SOIL 210 Introduction to Soil Science
Fall 2 credits

Physical, chemical, and biological properties of soils as related to use, conservation, and plant growth. AAS-MST. Concurrent registration in or previous successful completion of SOIL 210L is required.

SOIL 210L Introduction to Soil Science Lab
Fall 1 credit

Concurrent registration in or previous successful completion of SOIL 210 is required.

SOIL 222 Soil Fertility and Fertilizers
Spring 2 credits

Principles of plant nutrition and soil nutrient availability; soil testing and fertilizer recommendations and management. Macronutrient emphasis. Concurrent registration in or previous successful completion of SOIL 222L is required.

SOIL 222L Soil Fertility and Fertilizers Lab
Spring 1 credit

Concurrent registration in or previous successful completion of SOIL 222 is required.

VETERINARY SCIENCE (VETS)

VETS 101 Introduction to Veterinary Science
Spring 2 credits

This course is an introduction to veterinary science. It will provide students with an overview of different breeds and species; disease and treatment fundamentals; veterinary terminology; basic pharmacology; dose calculations and public health.

VETS 239 Animal Health Fall 3 credits

Principles of animal health; prevention, sanitation, chemotherapy, immunology, disease symptoms, and management.

ANTHROPOLOGY (ANTH)

ANTH 170 Physical Anthropology and Archaeology
BD 3 credits

This course introduces the subdisciplines of anthropology, the concept of culture, genetics, the evolution of the human species, the development of human culture up to the historic period, including the appearance of domestication and the origin of the state.

ART (ART)

ART 110 Introduction to the Visual Arts
F&S 3 credits

Study and analysis of artistic methods and the meaning of the visual arts.

ART 122 Two Dimensional Design F&S 3 credits

Study of line, shape, texture, value and color and the organizing principles of design that will allow students to become more effective visual communicators. There will be emphasis on problem solving, the creative process and critical thinking as they are applied to two-dimensional projects. Art fee $35.

ART 124 Three Dimensional Design
Spring 3 credits

Continued study of the visual elements and design principles as they relate to three dimensional spaces, including applications in areas such as sculpture, architecture, landscape design, industrial design and other allied fields. There will be continued emphasis on cultivating creativity, solving problems and developing critical thinking skills. Art fee $35. .

ART 130 Drawing I F&S 3 credits

Introduction, study and application of the visual elements using various drawing media and methods. There will be an emphasis on visual thinking through observation, analysis and expression.

ART 204-205 Jewelry I & II F&S 2 credits

This is an introduction to basic jewelry making where students will learn to design and create jewelry in various media. Clay, wire, enameling, metal fabrication, and lost wax casting will be covered. Art fee $100.

ART 210 Art History I Fall 3 credits

This is a survey course covering art of prehistoric humans through the Gothic Era (1400 A.D..) Students will gain an appreciation and understanding of art during this period through class discussion, lecture, slides, videos, and text reading. Art History I is designed to demonstrate the important role art has placed in history, politics and government, religion, and human development.

ART 211 Art History II Spring 3 credits
This is a survey course covering art of the Renaissance through the Modern Era. Students will gain an appreciation and understanding of the major art movements through class discussion, lecture, slides, videos, and text reading. Art History II is designed to demonstrate the important role art has placed in history, politics, and government, religion, and human development.

ART 220 Painting I F&S 3 credits
Introduction to the basics of painting through a variety of media and materials using still life subjects, models and imaginative expressions. Prerequisite: ART 130 or consent of instructor. Art fee $30.

ART 221 Painting II F&S 3 credits
A continuation of the concepts and techniques explored in Painting I with an emphasis on personal expression. Prerequisite: ART 220. Art fee $30.

ART 225-226 Water Media I-II BD 2 credits
Basic courses in the techniques of transparent watercolor. Art fee $15.

ART 230 Drawing II Spring 3 credits
Continuation of Drawing I emphasizing color and composition, as well as developing conceptual and critical abilities related to the visual expression of ideas. Prerequisite: ART 130.

ART 231 Figure Drawing I BD 3 credits
A study of the human figure as an end in itself through the use of pencils, charcoal and pastels. Prerequisite: ART 130.

ART 250-251 Ceramics I & II F&S 3 credits

Introductory course on origin, nature, and use of clay and glazes. Includes hand-building processes and basic wheel-forming methods. Art fee $70.

ART 252 Advanced Ceramics F&S 1-3 credits
Credits are repeatable or directed study of topics in ceramics. Advanced hand-building and wheel throwing techniques. Glazing and firing with emphasis on individual experimentation. Prerequisite: ART 250-251 or consent of instructor. Art fee $70. BSC ENR. Repeatable.

ART 265 Sculpture I F&S 2 credits
Introduction and study of visual expression in three-dimensional form using various sculptural media and methods. Art fee $35.

ART 266 Sculpture II Spring 2 credits
Continuation of Sculpture I with an emphasis on developing more advanced technical skills, as well as exploring media and concepts. Prerequisite: ART 265. Art fee $35.

ART 270-271 Printmaking I & II BD 3 credits
This is a basic course in the history of intaglio and collograph printmaking. Fundamental intaglio and collograph printing techniques will be emphasized. Prerequisite: ART 130 or ART 122 or consent of instructor. Art fee $25

ART 294 Independent Study BD 1-3 credits
Repeatable or directed study of special topics in art.

ART 296 Study Tour BD 1-3 credits
Students can earn credits by participating in BSC's annual trip to a foreign destination. Students will be required to keep an evaluative journal, do research and write a report on the art and architecture of the area visited.

ART 299 Special Topics in Art BD 1-3 credits
Repeatable up to six semester hours. An examination of special topics in art.

ART 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

ART 197-297 Cooperative Education/Internship F&S SM 1-3 credits each, repeatable up to a maximum of six hours.
Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

ASTRONOMY (ASTR, PHYS)

ASTR 150 Meteorology F&S EO 3 credits
An introduction to the atmosphere, including fronts and air masses, clouds and precipitation, our seasons, and global climate. Basic atmospheric processes and phenomena are studied to provide the student an understanding of our ever changing and sometimes dangerous day-to-day weather. Emphasis is placed on central North America. Concurrent registration ASTR 150L is required.

ASTR 150L Meteorology Lab F&S EO 1 credit
Students learn to plot and interpret weather maps and atmospheric temperature, moisture, and wind profiles. Real-time surface and upper air data are used to bring relevance to observations and resultant weather. Students develop basic forecasting skills, as well as basic observational skills. Concurrent registration in ASTR 150 is required.

PHYS 110 Introductory Astronomy Fall 3 credits
Concurrent registration in PHYS 110L is required. Brief history of ancient astronomy; the Copernican revolution and the beginning of modern astronomy (Copernicus, Kepler, Galileo, Newton); the appearance of the night sky, revolution and rotation of the Earth, celestial coordinate systems, the calendar and seasons; the nature of light and telescopes; structure and origin of the solar system; the Earth, atmospheric phenomena (rainbows, haloes, aurora, etc.) the Moon; the planets and their satellites; comets and solar system debris (asteroids and meteorites); distances and motions of the stars; formation of stellar spectra; the Sun; evolution of ordinary stars; evolution of massive stars and supernovae; neutron stars, pulsars and black holes; the Milky Way and other galaxies; the expanding universe, quasars and cosmology.

PHYS 110L Introductory Astronomy Lab Fall 1 credit
Laboratory exercises cover various aspects of astronomy, including measurement of planetary distances, appearance of the constellations and night sky, phases of the moon, differences between terrestrial and Jovian planets, measurements of parallax, and construction of Hertzprung-Russell diagrams. Concurrent registration in PHYS 110 is required.

AUTOCAD (CAD)
SEE ENGINEERING

AUTOMOTIVE COLLISION TECHNOLOGY (ABOD)

ABOD 100 Introduction to Automotive Collision Technology Fall 2 credits

Students are introduced to automotive collision technology career requirements, the language of the trade, and shop safety.

ABOD 105 Introduction to Metal Finishing Fall 5 credits

This course covers the proper methods of filing, metal picking, and use of power grinders to properly finish metal surfaces, as well as the theory of expansion and contraction of metals during welding. Students are introduced to when and how to use plastic fillers. Shop safety is stressed.

ABOD 107 Introduction to Sanding, Priming and Painting Fall 6 credits

Students are introduced to thinning and the proper use of primer. The proper use of sandpaper and the art of sanding are initiated and practiced at this time.

ABOD 108 Intermediate Metal Finishing Spring 4 credits

Prerequisite or departmental approval: ABOD. A lab course in which students are introduced to roughing out and aligning damaged areas of a vehicle. Students upgrade their manipulative skills.

ABOD 109 Plastics and Adhesives Spring 4 credits

Different types of plastic material are introduced. Students are in lab practicing the use of adhesives on plastic repairs.

ABOD 110 Auto Body Welding Fall 4 credits

Students are introduced to basic training in the use of oxyacetylene torch and wire feed welders. Equipment, safety, and common weld joints are covered using both welding processes. Lecture and shop instruction apply welding techniques and process used in industry. Welding fuels, gases, electric current, electrodes and their applications are introduced.

ABOD 112 Introduction to Painting Spring 4 credits

Prerequisite or departmental approval: ABOD 105 and 107. The proper use, maintenance and adjustment of paint equipment is demonstrated. Students are introduced to thinners, reducers and additives in paint, and to painting damaged vehicles.

ABOD 114 Component Parts - Replacement and Adjustment Spring 5 credits

Students are introduced to the techniques of installing and properly adjusting doors, hoods, and trunk lids, and replacing and aligning new body panels. This course also covers the proper techniques of installing windshields, window regulators and glass channels.

ABOD 200 Mechanical and Electrical Components Summer 5 credits

Demonstrate the proper use, maintenance, and adjustment of electrical and mechanical equipment. Introduce multi-meters, various testing equipment, and troubleshooting techniques. The course consists of theory and receiving hands-on experience in the different types of electrical and mechanical components.

ABOD 210 Advanced Painting Summer 1 credit

This is a lecture demonstration and application course in learning color control to apply and blend with existing color in spot painting. Factory representatives will also demonstrate the latest paints and painting techniques.

ABOD 216 Frame Straightening and Wheel Alignment Summer 3 credits

A lab course in which students are introduced to frame straightening equipment used to align damaged channel frames, installation of bumpers on vehicle, and setting caster, camber, and toe-in of modern car.

ABOD 220 Estimating and Industrial Management Summer 1 credit

Students are introduced to estimating, bidding and using crash manuals by appraising jobs. Students also get practical experience in management by operating the storeroom and stock control room. Personal and public relations are also covered.

ABOD 294 Independent Study 1-3 credits

Independent or directed study of special topics in automotive collision technology. Department chairperson approval required.

ABOD 299 Special Topics 1-3 credits

Variable instructional topics in the field of automotive collision technology. Repeatable as long as content varies. Consent of department chairperson.

ABOD 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

ABOD 197-297 Cooperative Education/Internship 1-3 credits repeatable up to six semester hours.

Students get on-the-job experience under qualified supervision in auto collision technology occupations. Work hours are arranged by employer, advisor and student. Student progress is checked by oral and written reports from the employer. Student advisor conferences are held to discuss progress and/or problems. All co-op experiences are graded on a satisfactory/unsatisfactory basis. Consent of department chairperson.

AUTOMOTIVE TECHNOLOGY (AUTO)

AUTO 101 Introduction to Automotive Technology F&S 3 credit

This course is a study of the basic terms, principles, operation and testing of the eight major operating systems of the automobile. The major automotive systems include electrical, brakes, engine repair, air conditioning, suspension and steering, engine performance, manual transmissions and automatic transmissions.

AUTO 108 Mechanical and Shop Orientation F&S 1 credit

A course in safety and shop procedures applied specifically to the automotive field. Students will become familiar with safety equipment, hoists, and shop operating procedures. Included are hazardous waste handling, disposal, and use of material safety data sheets. This course is based on a satisfactory/unsatisfactory basis.

AUTO 128 Automatic Transmissions and Transaxles Spring 5 credits

Prerequisite: AUTO 161 and 108 or departmental approval. This course concentrates on study of basic principles of operation in automatic transmission hydraulic control systems, planetary gear systems, and torque converters through classroom lecture and demonstration. The diagnosis of problems and methods of repair are actual hands-on projects in the shop on live vehicles and trainers.

AUTO 131 Clutches, Drive Trains and Axles Spring 3 credits

Prerequisite: AUTO 161 and 108 or departmental approval. This course concentrates on a study of the mechanical transmission of torque through clutches, gear boxes, drive lines and front driving axles. The diagnosis of problems and methods of repair and actual hands-on projects in the shop on live vehicles and trainers.

AUTO 132 Manual Transmissions and Transaxles Spring 3 credits

Prerequisites: AUTO 161 and 108 or departmental approval. This course concentrates on the transmission of torque through manual transmissions and transaxles. Course content includes a study of bearing and gear types. A variety of gear boxes on hand allows hands-on projects in the shop class.

AUTO 148 Suspension and Steering Spring 4 credits

Prerequisites: AUTO 161 and 108 or departmental approval. This course concentrates on a study of the principles of operation and design of suspension systems on modern cars and light trucks. Actual hands-on work in the shop on live vehicles and new trainers complements the classroom training.

AUTO 151 Brake Fundamentals Fall 2 credits

Prerequisites: AUTO 161 or 108 or departmental approval. The study of automotive braking system and theory and operation. Included are hydraulic fundamentals, brake system construction, and antilock brake system fundamentals. The course consists of classroom theory, demonstration and lab application.

AUTO 152 Brake Repair Fall 3 credits

Prerequisite: AUTO 151, 161 and 108 or departmental approval. This course will be a study of brake components, application, testing and repair. The use of trainer and live vehicles will be used to develop proper service techniques in the lab.

AUTO 161 Electronics F&S 2 credits

Prerequisites: AUTO 108 or departmental approval. This course develops an understanding of the concepts using Ohms Law relationships and how they are applied to circuits and component operation. The use of meter testing and calculation methods will be used to develop problem solving skills.

AUTO 163 Starting and Charging Systems Fall 3 credits

Prerequisites: AUTO 161 and 108 or departmental approval. The theory of operation for batteries, starting motor system, and charging systems are covered. An in-depth review of types of components, their construction and how they are tested is done using bench units and live cars. Extensive use of manuals, test equipment and proper tools are stressed for doing proper service, repair and replacement of system components.

AUTO 164 Instruments and Accessory Systems Fall 4 credits

Prerequisites: AUTO 161 and 108 or departmental approval. This course will familiarize the student with the lighting systems used on today's automobiles. It will introduce the major manufacturers use of different types of instrumentation systems and their operation. The use of power accessory systems and component interrelationship, testing procedures and service procedures to maintain operation to specification are dealt with. Extensive use of manuals and test equipment are needed.

AUTO 211 Engine Fundamentals Fall 4 credits

Prerequisite: AUTO 161 and 108 or departmental approval. A course in gasoline engine theory and basic diagnosis. Common mechanical engine problems and diagnostic techniques are covered in the classroom and lab. Students will learn the proper use of measuring tools and fastener methods so critical to engine repair work as well as all automotive work.

AUTO 212 Engine Repair Fall 4 credits

Prerequisite: AUTO 161, 108 and 211 or departmental approval. Class and laboratory practice devoted to disassembly and assembly of automotive engines. This will include measuring and fitting components such as bearings, pistons, and rings. Cylinder head reconditioning work will include guide repair, valve and seat machining operations.

AUTO 271 A/C Heating Theory and Operation Fall 3 credits

Prerequisites: AUTO 161 and 108 or departmental approval. This course will familiarize the student with terms, how heat is transferred, pressure-temperature relationships, system components, and how they operate to provide heat or cooling. Extensive use of manuals is needed to understand the varied methods used by the industry in today's automobiles.

AUTO 272 AC Heating Diagnosis and Service Fall 4 credits

Prerequisites: AUTO 108, 161 and 271 or departmental approval. This course will familiarize the student with the safe handling of coolants and refrigerants. An in-depth use of special tools and testing equipment is used in the servicing of both the systems and the components.

AUTO 282 Ignition Systems Spring 3 credits

Prerequisites: AUTO 161 and 108 or departmental approval. This course is the study of the types of ignition systems in use by major automotive manufacturers. Theory and lab classes will cover operation and service procedures, including the use of basic and specialized test equipment.

AUTO 283 Fuel Delivery Systems Spring 6 credits

Prerequisites: AUTO 161 and 108 or departmental approval. A course consisting of theory, diagnosis and repair of basic fuel delivery systems. These systems will include various types of gasoline fuel injection and carburetion.

AUTO 284 Emission Control Systems Spring 6 credits

Prerequisites: AUTO 161 and 108 or departmental approval. A course consisting of theory, diagnosis and repair of emission control systems used on automotive gasoline engines. Systems covered will include evaporative, crankcase and exhaust emission controls.

AUTO 294 Independent Study 1-3 credits

Independent or directed study of special topics in automotive technology. Department chairperson approval required.

AUTO 299 Special Topics 1-3 credits

Variable topics on the technology of the automotive industry. Repeatable as long as content varies. Consent of department chairperson.

AUTO 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

AUTO 197-297 Cooperative Education/Internship 1-3 credits

Repeatable up to six semester hours. Students get on-the job experience under qualified supervision in automotive technology occupations. Work hours arranged by employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student-advisor conferences are held to discuss progress and/ or problems. All co-op experiences are graded on a satisfactory/unsatisfactory basis. Consent of department chairperson.

BIOLOGY (ASC, BIOL, BOT, MICR)

ACADEMIC SKILLS COURSES

ASC 098 Basic Biology BD 3 credits

The study of Basic Biology 098 is intended to help those students without sufficient background in biology and chemistry to be successful in General Biology 150, Introductory Microbiology 202 or Anatomy & Physiology 220. Selected topics will include: chemistry as required to comprehend biology, basic cellular concepts, and human body systems and their functions. Concurrent registration in or previous successful completion of ASC 098L is required.

ASC 098L Basic Biology Lab BD 1 credit

Basic Biology 098 Lab is intended to help familiarize students with techniques and equipment necessary to be competent in the laboratory. Lab work will focus on introducing students to the process of scientific investigation, the use and care of the microscope, basic biological concepts, and the structure and function of the human body. Concurrent registration in or previous successful completion of ASC 098 lecture is required.

COLLEGE LEVEL COURSES

BIOL 102 Introduction to Aquarium Keeping F&S 1 credit

Introduction to Aquarium Keeping will explore the types of aquaria, aquarium equipment and maintenance, plants and animals for the aquarium and how to troubleshoot problems aquarium keepers may face.

BIOL 108 Beginning Birding Spring 1 credit

This course is an introduction to the fascinating world of birds. Students will become familiar with the tools of birding such as binoculars, spotting scopes, field guides, and multimedia references. The course will also focus on characteristics of bird families and the identification of individual species before we go out in the field. The last portion of the class will concentrate on locating and identifying birds in their natural habitats. Students must be able to walk over uneven terrain.

BIOL 109 The Living World F&S 3 credits

This course will cover basic concepts in biology, natural history, sociobiology and human biosocial interaction. The course is not intended for students pursuing careers in the biological sciences or students requiring a full year of general biology. This course does not meet the lab science requirement.

BIOL 111 Concepts of Biology F&S SM 3 credits

Biology 111, in conjunction with Biology 111L, is designed to fulfill the lab science requirement of the student planning a non-science major. Included are discussions on the nature of living things, genetics, DNA, biotechnology, evolution, the diversity of living things, and ecology. Concurrent registration in or previous successful completion of BIOL 111L is required.

BIOL 111L Concepts of Biology Lab F&S SM 1 credit

Biology 111L, in conjunction with Biology 111, is designed to fulfill the lab science requirement of the student planing a non-science major. Included are laboratory activities on the nature of scientific thinking, genetics, biotechnology, evolution and ecology. Concurrent registration in or previous successful completion of BIOL 111 is required.

BIOL 124 Environmental Science F&S 3 credits

Prerequisite ENGL 110. An introduction to the basic concepts of ecology will provide the framework for investigating current and potential environmental problems. Over-population, air and water pollution, contamination of food, accumulation of medical and other biohazardous wastes, and depletion and exploitation of natural resources will be discussed. The role of individuals, businesses, and professions in limiting environmental problems will be stressed. No prerequisite. This course does not meet the lab science requirement, but it counts as a science course.

BIOL 126 Human Biology F&S 3 credits

Biology 126 is designed to be an introduction for students planning on taking higher level anatomy and physiology courses. The course will include a wide range of topics associated with the human body and human life. This course, when taken with the associated lab, will fulfill the lab science requirements for the student planning a non-science major.

BIOL 126L Human Biology Lab F&S 1 credit

Biology 126L, in conjunction with Biology 126, is designed to introduce students to the study of human anatomy and physiology. Included are laboratory activities on structure and function of the human body.

BIOL 150-151 General Biology I&II F&S 3 credits each

Biology 150 (no prerequisite) will cover the fundamental concepts of biology. Included will be discussions of the cellular nature of living things, cell anatomy and basic cell physiology. Special emphasis will be placed on DNA and protein synthesis, cellular respiration, photosynthesis, and the cell cycle. Instruction in Mendelian inheritance and molecular genetics will complete the semester. Biology 151 (no prerequisite) introduces theories of the origins of life on earth, evolution and describes current biological diversity. An overview of prokaryotes, protists, fungi, animals and plants will be included. The final segment of the course will include discussions on biogeography, population dynamics and community ecology. Concurrent registration in or previous successful completion of BIOL 150L-151L is required.

BIOL 150L-151L General Biology I-II Lab F&S 1 credit each

Laboratories to accompany BIOL 150- 151. Concurrent registration in or previous successful completion of BIOL 150-151 is required.

BIOL 213 General Pathology Fall 2 credits

This course will give students basic introduction to the human disease process. It will encompass an overview of normal anatomy and physiology followed by discussions relating to diagnoses, signs, symptoms and treatment options for various diseases in the 12 body systems.

BIOL 220 Anatomy and Physiology I F&S 3 credits

Prerequisite: BIOL 126 or departmental consent; chemistry strongly recommended. This is the first in a sequence of two courses in which discussions of anatomy and physiology are interwoven in an attempt to present a unified picture of the structure and function of the organs and systems of the human body. These courses include biochemistry, cells, tissues, and the following systems: integumentary, skeletal, muscular, nervous, and special senses. Both gross and microscopic structures are studied. Concurrent registration in or previous successful completion of BIOL 220L is required.

BIOL 220L Anatomy and Physiology I Lab F&S 1 credit

Concurrent registration in or previous successful completion of BIOL 220 is required. Anatomical structures are studied at both gross and microscopic levels. Experiments are performed demonstrating fundamental physiological principles.

BIOL 221 Anatomy and Physiology II
F&S 3 credits

Prerequisite: BIOL 220 and 220L. This is the second of two courses in which discussions of anatomy and physiology are interwoven in an attempt to present a unified picture of the structure and function of the organs and systems of the human body. The following systems are examined: endocrine, cardiovascular, lymphatic, immune, respiratory, digestive, urinary, and reproductive. Both gross and microscopic structures are studied. Concurrent registration in, or previous successful completion of BIOL 221L is required.

BIOL 221L Anatomy and Physiology II Lab
F&S 1 credit

Concurrent registration in or previous successful completion of BIOL 221 is required. Anatomical structures are studied at both gross and microscopic levels. Experiments are performed demonstrating fundamental physiological principles.

BIOL 294 Independent Study 1-3 credits

Independent or directed study of special topics in biology. Department chairperson approval is required.

BIOL 250 Survey of Tropical Biology
SM BD 3 credits

This course will survey the basic concepts of tropical biology. It will provide the student with a sound foundation in tropical ecosystems and biodiversity. This course will include formal lectures and laboratory field work in a tropical setting. When taken with BIOL 250L, it satisfies a four-credit lab science requirement. The lecture topics will include tropical plant adaptations and defenses, tropical invertebrate and vertebrate diversity and conservation issues. Special emphasis will be given to comparing the differences between tropical areas and temperate zones. This course is intended for any student regardless of major or background and there are no prerequisites. Instructor's approval required for admission. Corequisite: BIOL 250L.

BIOL 250L Survey of Tropical Biology Lab
SM BD 1 credit

This lab accompanies BIOL 250. The lab will consist of laboratory field work in a tropical setting and experiments designed to help the students better understand tropical biological concepts and techniques. Experiments that will be performed include marking and recapturing spiders, fish species diversity, identification of neotropical moths, population estimates, and more. Corequisite: BIOL 250.

BIOL 251 Community Ecology Fall 3 credits

This course will introduce basic ecological concepts; describe the ecological structure, patterns, processes, and interactions of selected ecological communities and their organisms; and discuss human influences to these communities. Travel to specific ecological communities may be required. Corequisite: BIOL 251L.

BIOL 251L Community Ecology Lab Fall 1 credit

The laboratory includes fieldwork in selected ecological communities. Students will measure and analyze various biotic and abiotic factors and relate these to observed differences in community structure. Corequisite: BIOL 251.

BIOL 299 Special Topics BD 1-3 credits

Repeatable up to six semester hours. An examination of special topics in biology and related fields.

BIOL 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

BIOL 197-297 Cooperative Education/ Internship
F&S SM 1-3 credits each

Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

BOTANY (BOT)

BOT 170 Plant Form and Diversity Spring 3 credits

Botany 170 is designed for the plant lover in all of us – the science major and non-major alike. Topics include the cellular nature of plants; plant structure, anatomy, and physiology; diversity of plants, and fungi; and human uses for plants. Concurrent registration in or previous successful completion of BIOL 170L is required.

BOT 170L Plant Form and Diversity Lab
Spring 1 credit

Botany 170L is the laboratory to accompany Botany 170. Topics included are the cellular nature of plants; plant structure, anatomy, and physiology; diversity of plants, and fungi; and human uses for plants. Concurrent registration in or previous successful completion of BIOL 170 is required.

MICROBIOLOGY (MICR)

MICR 202 Introductory Microbiology F&S 3 credits

This course will include the study of cell structure and physiology of microorganisms, methods of microbial control, specific and nonspecific host defenses and epidemiology. Emphasis will be given to medically significant pathogens including bacteria, viruses, fungi and protozoa. Concurrent registration in or previous successful completion of MICR 202L is required. Prerequisite (one of the following): BIOL 150, 151, 126, 220 or 221.

MICR 202L Introductory Microbiology Laboratory
F&S 1 credit

Students will learn basic microbiology techniques and principles as they study the characteristics of representative bacteria and fungi. Concurrent registration in or previous successful completion of MICR 202 is required.

BOTANY (BOT)

SEE BIOLOGY

BUSINESS (BADM, BUSN)

BUSINESS ADMINISTRATION (BADM)

BADM 201 Principles of Marketing F&S 3 credits

An introductory course designed to cover the basic marketing concepts. Discussion focuses on market segmentation, consumer behavior and marketing mix strategy of products or services.

BADM 202 Principles of Management
F&S 3 credits

The study of management is approached from a system basis. It ensures the student will receive a thorough understanding of the environment, problems and duties that confront the manager. Topics include planning and decision making, organizing, controlling, and leadership.

BADM 210 Advertising I F&S 3 credits
This course covers advertising from a marketing perspective. The focus is on planning and strategy development of an advertising program. Topics covered are campaign planning and development, marketing mix relationships, media options and buying and creative strategy.

BADM 224 Management Information Systems Spring 3 credits
Prerequisite: Principles of Management 202. An introduction to management information systems, microcomputer applications in business, office information systems and systems analysis and design.

BADM 240 Sales F&S 3 credits
An introductory study of salesmanship. All aspects of selling are introduced including the psychology of selling and recommended personality traits for sales people.

BADM 241 Sales Management F&S 3 credits
This course is a study of sales management with contemporary business firms. The course focuses on the development of managerial knowledge and skills including: developing sales strategies, organizing sales activities, developing leadership and supervision, motivation, evaluation techniques and development of sales forecasts. This is intended to be a capstone course for the business management program.

BADM 260 Principles of Retailing F&S 3 credits
Covers retail store operations—the independent retailer, the chain store, the specialty shop, the department store, etc. The operations of buying, selling, selecting personnel, pricing, markup, and markdowns are all covered. Also retail stores promotion, window display, and credit, selection of business location, layout, control and methods of computing various ratios.

BADM 274 Project Management F&S 3 credits
This course is designed to familiarize individuals with how project management differs from general management. Additional topics include project phases/steps, the role of the project manager. A variety of project tools such as, PERT/CPM/Gantt Charts, Precedence Diagram, Scheduling, Scope Control, Cost Control, Change Control and Resource Planning. A review of project management software is also included. People are a vital element of a project therefore selecting the right team members, building the team, gaining commitment, organizational structures, power and politics in project management will be discussed.

BADM 281 Organizational Behavior F&S 3 credits
This course covers principles, concepts and processes involved in interpersonal relationships in an organization. Discussion focuses on individual, group and organizational situations through case studies and role plays.

BADM 282 Human Resource Management F&S 3 credits
The course covers the various processes of personnel management such as recruiting, training, motivating, and counseling. Discussion centers around the tools, techniques, and methods that can be utilized in the management of personnel in any organization.

BADM 299 Special Topics BD 1-3 credits
Variable instructional topics under the broad umbrella of management. Repeatable as long as content varies. Consent of department chairperson. BSC-ENR.

BADM 195-295 Service Learning 1-3 credits
Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

BADM 197 Cooperative Education/Internship F&S SM 1-3 credits each
Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/ unsatisfactory basis. Department chair approval is required.

BUSINESS (BUSN)

BUSN 120 Fundamentals of Business F&S 3 credits
Fundamentals of business management from the point of view of the business as a whole including basic management concepts and principles, forms of business organizations, organizations for administration, and major functions of management.

BUSN 170 Entrepreneurship F&S 3 credits
This course is designed to provide training for students who want to plan and organize their own business idea. It will provide information, resources and methods used in the development of a market research study, a feasibility study and a business plan.

BUSN 224 Electronic Commerce (E-Commerce) F&S 3 credits
This course is designed to familiarize individuals with current and emerging electronic commerce technologies using the Internet. Topics include Internet technology for business advantage, managing electronic commerce funds transfer, reinventing the future of business through electronic commerce, business opportunities in electronic commerce, electronic commerce website design, social, political and ethical issues associated with electronic commerce, and business plans for technology ventures. The purpose of this course is to educate a new generation of managers, planners, analysts, and programmers of the realities and potential for electronic commerce.

BUSN 294 Independent Study 1-3 credits
Independent or directed study of special topics in business. Department chairperson approval is required.

BUSN 299 Special Topics in Business Administration BD 1-3 credits
Repeatable up to six semester hours. An examination of special topics in business administration.

BUILDING CONSTRUCTION TECHNOLOGY (BCT)
SEE CARPENTRY

BUSINESS AND OFFICE TECHNOLOGY (BOTE)

BOTE 102 Keyboarding I F&S 3 credits
Learning the alphanumeric keyboard on the microcomputer with emphasis on skill building, letters, reports and tabulation.

BOTE 108 Business Mathematics F&S 3 credits
Review of fundamental processes and their application to business. Among topics studied are percentages, commissions, inventories, payrolls, taxes, interest, insurance, stocks and bonds.

BOTE 113 Elementary Anatomy and Physiology Fall 2 credits

This is a first semester course and a concise course designed for medical administrative assistants and others who will not go into the biological sciences. Emphasis will be placed on a broad basic knowledge of the skin, bones, muscles, and nerves and the development of a vocabulary of common anatomical terms.

BOTE 114 Elementary Anatomy and Physiology Spring 2 credits

This is a second semester course designed for medical administrative assistants and others who will not go into the biological sciences. Emphasis will be placed on a broad basic knowledge of the special senses, the heart, respiration, digestion, and reproductive systems. Students will develop a vocabulary of common anatomical terms.

BOTE 116 Student Leadership Practicum (Phi Beta Lambda) F&S 1 credit

Phi Beta Lambda provides opportunities for leadership training, personal development, community service, and further development of business-specific skills. PBL is open to any BSC student who has completed one business course during previous semesters or is concurrently enrolled in at least one business course as part of their degree program. Students may enroll in course more than one semester. Repeatable four times.

BOTE 121 Business English Fall 3 credits

Business English grammar fundamentals which assist the college students in fulfilling a prerequisite for successful communication: a high degree of skill pertaining to the principles of grammar, usage, and basic sentence structure.

BOTE 122 Business English Spring 3 credits

A course in business English pertaining to a high degree of skill in sentence structure, punctuation, number style, spelling, word division, word usage, proofreading and editing. This theory is applied in transcribing business letters and memos by using the transcribing machine. Prerequisite: BOTE 121.

BOTE 138 Medical Coding I (IVN DCB) Fall 2 credits

This course teaches the basic skills needed for medical coding. In the fall semester, emphasis is on CPT coding with practical application. Prerequisite: BOTE 171.

BOTE 139 Medical Coding II (IVN DCB) Spring 2 credits

This course teaches the basic skills needed for medical coding. The spring semester is an overview of the ICD-9-CM coding and reimbursement issues. Prerequisite: BOTE 171.

BOTE 152 Keyboarding II F&S 3 credits

A course using the microcomputer with selected software on concentrated drills to increase speed and accuracy. Students will also prepare letters, memos, reports, tabulations, as well as special problems. Prerequisite: Keyboarding I or ability to key with proper technique approximately 30-35 words per minute.

BOTE 171 Medical Terminology Fall 3 credits

This course is a study of prefixes, suffixes, and root words of medical terms and their meaning, spelling and pronunciation. Designed for medical administrative assistants and related areas.

BOTE 172 Medical Terminology Spring 3 credits

A review of medical vocabulary, this course also covers aspects of pathology, surgical operations, and diagnostic and therapeutic procedures, with a greater comprehension of human anatomy and physiology. The course also covers medical abbreviations and the principal terms used in pharmacology and radiology. Prerequisite: BOTE 171 or permission from instructor.

BOTE 209 Office Management Fall 3 credits

Introduction of office management concepts and technology, including office facilities development, office systems, human relations, office ethics and etiquette, and various administrative duties and responsibilities.

BOTE 210 Business Communications F&S 3 credits

A creative business letter-writing course with emphasis on vocabulary and review of grammar combined with computer skills to produce clear, concise, correct, courteous and complete business letters. Report writing, team presentation, and oral communication included.

BOTE 222 Medical Transcription I Fall 3 credits

First semester course. Arrangement of professional charts, medical records, history sheets, and laboratory reports dictated by a professional dictator and covering physicals, radiology, operations, pathology, and autopsies.

BOTE 223 Medical Transcription II Spring 3 credits

Second semester course. Arrangement of professional charts, medical records, history sheets, and laboratory reports dictated by foreign doctors and covering endocrinology, special senses, neurology, pediatrics, obstetrics, and corrective surgery.

BOTE 251 Legal Transcription Spring 2 credits

Development of the administrative assistant's skills in the area of legal transcription. Students gain understanding of letters, legal documents, and forms used in the legal office. Students learn how to plan and organize legal forms and documents used in the litigation process.

BOTE 253 Legal Office Procedures Fall 3 credits

This course familiarizes students with law office setup, ethics, mailing procedures, law office dockets, and communication skills. Emphasis on terminology and spelling. Emphasis will also be placed on law office procedures and the legal administrative assistant's responsibility to employers and clients.

BOTE 294 Independent Study 1-3 credits

Independent or directed study of special topics in business and office technology. Department chairperson approval required.

BOTE 299 Special Topics BD 1-3 credits

Variable topics in the field of office technology. Repeatable as long as content varies. Consent of department chairperson. .

BOTE 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

BOTE 197-297 Cooperative Education/Internship F&S SM 1-3 credits

Repeatable up to six semester hours. Students get on-the-job experience under qualified supervision in computer applications and office technology occupations. Work hours are arranged by the employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student-advisor conferences are held to discuss progress and/or problems. All co-op experiences are graded on a satisfactory/unsatisfactory basis. Consent of department chairperson.

CARPENTRY (CARP)

BUILDING CONSTRUCTION TECHNOLOGY (BCT)

ARCT 144 Construction Estimating Fall 3 credits
This course is an introduction to residential material estimating. Techniques, formulas and tools to develop complete and accurate construction estimates will be studied.

CMT 252 Project Management Fall 3 credits
Prerequisite: BCT 216 and BCT 218. This course is designed to provide study in construction project management. Students will study, develop and apply work place interpersonal skills, construction documentation, trades and resource scheduling and control and construction planning.

CMT 253 Construction Scheduling Spring 3 credits
Prerequisite CMT 252. This course is design to give an overview of construction scheduling. Emphasis will be placed on coordinating plans, specifications, construction materials, employees, subcontractors, equipment and evaluating if resources and schedules are being utilized in an efficient and profitable process.

BCT 216 Sustainable Building I Spring 3 credits
This course introduces and defines sustainable/green building. Energy efficiency and conservation will be studied as a system considering materials production, site selection and design, building construction, owning and maintaining a sustainable/green home, impact on the natural environmental by the built environment, and the end of life cycle and deconstruction of buildings. Emphasis will be placed on preparing students for Sustainable Building II in which students will design a sustainable/green-built home and study the construction process and contracting of the home.

BCT 218 Sustainable Building Science II Spring 3 credits
Prerequisite: BCT 216. This course is a study of how the systems of a house are combined to form a sustainable/green built whole house system. Emphasis will be placed on the sequence of construction and the functioning interrelationship of the systems. Students will be required to design a home based on the concepts studied in BCT 216 and 218.

BCT 222 Construction Safety Spring 3 credits
This course is designed to parallel the 29CFR1926 OSHA Construction Industry Regulations and to conform to the National Center for Construction Education and Research (NCCER). The course covers both the compliance as well as best practices in the construction industry as they pertain to safety.

BCT 260 Residential Building Codes Spring 3 credits
This course is a study of residential building codes. Students will learn specific codes, effective use of code books, and the importance of building codes on the home building industry.

BCT 264 Residential Energy Rating Systems Spring 3 credits
This course covers how energy is used, conserved, and measured in a residential structure. National home energy rating and certification systems will be studied including LEED, Energy Star, and National Green Building Standard systems.

BCT 276 House Systems Spring 3 credits
Prerequisite: CARP 110 or BCT 216. This course is designed to give an overview of integrated residential home systems. Introductory study in the areas of mechanical and electrical systems will be provided. The study will be designed for students with little or no experience in the mechanical or electrical trades.

CARPENTRY (CARP)

CARP 102 Core Curriculum Fall 2 credits
Core curriculum from The National Center for Construction Education and Research (NCCER), consists of eight modules which are: "Basic Safety," "Construction Math," "Hand Tools" "Power Tools," "Blueprints," "Basic Rigging," "Communication Skills," and "Employability Skills." This course is a prerequisite for all NCCER "Craft Level Training," (regardless of the craft).

CARP 110 Blueprint Reading Fall 2 credits
Designed to provide the basic understanding of standard residential blueprints including plot plans, foundation plans, floor plans, elevations, details of mechanical and electrical plans, and a basic understanding of residential building codes.

CARP 112 Introduction to the Green Environment Fall 3 credits
This course is designed to introduce students to an understanding of the green mind-set. Discussions will cover the impact of building on the green environment within the context of market realities.

CARP 115 Site Layout and Foundation Construction Fall 3 credits
Students will receive training and hands-on experience in preparation of a building site and foundation construction. Instruction will include laying out building lines, establishing batter boards, concrete footings and foundations, and studying alternate foundation systems.

CARP 120 Principles of Framing Fall 3 credits
This is a comprehensive course which concerns instruction and study on the techniques and practices required for successful employment as a framing carpenter. Areas covered will include layout of floors and walls, engineering truss systems, joist and rafter systems, and stairway construction.

CARP 125 Framing I Fall 6 credits
This lab will increase the student's knowledge, skills, and proficiency in framing by applying the techniques learned in 120-Principles of Framing. Activities will center around the actual construction of a house.

CARP 130 Exterior Finish Fall 2 credits
This course deals with the basics of residential exterior finish. Instruction will include units on fascia and soffit construction, windows and exterior door installation, and siding and roofing.

CARP 135 Framing II Spring 4 credits
This course is designed to increase students knowledge and skill in residential construction. Activities will center around specialty exterior and interior framing during the construction of an actual house.

CARP 140 Principles of Interior Finish Spring 3 credits
This course provides an understanding of materials and processes used in interior finishing. Instruction will include units in drywall, interior doors, interior trim, floor underlayment and applying finishes.

CARP 145 Interior Finish Spring 6 credits
This lab will increase the student's knowledge, skills and proficiency in interior finishing by applying techniques learned in 140-Principles of Interior Finish. Activities will center around the construction of an actual house.

CARP 150 Cabinetmaking Spring 3 credits
Instruction in the design and layout of kitchens, cabinets, vanities, countertops, and built-in closets. Students will increase their knowledge, skill, and proficiency through actual construction of cabinets.

CARP 155 House Design and Code Requirements Spring 2 credits
Students will study home design and code requirements. Interior, exterior and environmental factors affecting the design of homes will be considered and explored.

CARP 294 Independent Study 1-3 credits
Independent or directed study of special topics in carpentry. Department chairperson approval required.

CARP 299 Special Topics 1-3 credits
Variable instructional topics in the field of carpentry. Repeatable as long as content varies. Consent of department chairperson.

CARP 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

CARP 197-297 Cooperative Education/Internship 1-3 credits
Repeatable up to six semester hours. Students get on-the-job experience under qualified supervision in carpentry occupations. Work hours are arranged by the employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student advisor conferences are held to discuss progress and/or problems. All co-op experiences are graded on a satisfactory/unsatisfactory basis. Consent of department chairperson.

CHEMISTRY (CHEM)

CHEM 110 Survey of Chemistry Fall BD 3 credits
Course designed specifically for non-science majors who wish to obtain a basic understanding of chemistry as applied in the world today. Does not serve as a prerequisite for other chemistry courses. Concurrent registration in CHEM 110L is required.

CHEM 110L Survey of Chemistry Lab Fall BD 1 credit
One two-hour lab session per week. An introduction to general and organic chemistry laboratory techniques with an emphasis on applications drawn from health, environmental and industrial sciences. Concurrent registration in CHEM 110 is required.

CHEM 112 Introduction to Forensic Science F&S 3 credits
Prerequisite: MATH 102. Introduces the basic principles and relationships between the applications of chemistry to forensic sciences as they relate to the criminal investigative process. Areas included are blood analysis, hair analysis, firearm identification, fiber comparisons, paints, glass compositions, soil comparison, and seminal fluid analysis. Upon completion of this course students should understand the potential value of forensic science and also the limitations. Concurrent registration in CHEM 112L required.

CHEM 112L Introduction to Forensic Science Lab F&S 1 credit
Prerequisite: MATH 102. Concurrent registration in CHEM 112 required.

CHEM 114 Chemistry in Art Spring BD 3 credits
This course is designed specifically for non-science majors and liberal arts majors who wish to obtain the elementary principles and theories of chemistry and the study of chemical elements and their compounds as relevant to art topics and real-world uses. It does NOT serve as a prerequisite for any other chemistry courses. Concurrent registration in CHEM 114L required.

CHEM 114L Chemistry in Art Lab Spring BD 1 credit
One two-hour lab session per week. Concurrent registration in CHEM 114 is required.

CHEM 115 Introductory Chemistry F&S SM 4 credits
Elementary principles and theories of chemistry and the study of chemical elements and their compounds. Concurrent registration in CHEM 115L is required. Prerequisite: MATH 102 or higher or instructor permission.

CHEM 115L Introductory Chemistry Lab F&S SM 1 credit
One two-hour lab session per week. Concurrent registration in CHEM 115 is required.

CHEM 116 Introduction to Organic and Biochemistry F&S SM 4 credits
Prerequisite: Passing grade of 'C' or better in CHEM 115 or CHEM 121 within the past three years. Emphasis is placed on organic and biochemistry. Especially intended for students who wish to include organic and biochemistry their first year. Required for students planning degrees in nursing, clinical lab technician and other allied health fields. Concurrent registration in CHEM 116L is required.

CHEM 116L Introduction to Organic and Biochemistry Lab F&S SM 1 credit
One two-hour lab session per week. Concurrent registration in CHEM 116 is required.

CHEM 121 General Chemistry I F&S 4 credits
Prerequisite: CHEM 115 or one year high school chemistry and MATH 103 or higher. Required of engineers, pre-medical students, clinical lab scientists, pharmacists, chiropractors and others planning on advanced courses in chemistry. Covers matter, measurement, atoms, ions, molecules, reactions, chemical calculations, thermochemistry, bonding, molecular geometry, periodicity, and gases. Concurrent registration in CHEM 121L is required.

CHEM 121L General Chemistry I Lab F&S 1 credit
One three-hour lab session per week. Concurrent registration in CHEM 121 is required.

CHEM 122 General Chemistry II F&S 4 credits
Prerequisite: A passing grade of 'C' or better in CHEM 121. Covers intermolecular forces, liquids, solids, kinetics, equilibria, acids and bases, solution chemistry, precipitation, thermodynamics, electrochemistry. Concurrent registration in CHEM 122L is required.

CHEM 122L General Chemistry II Lab F&S 1 credit
One three-hour lab session per week. Concurrent registration in CHEM 122 is required.

CHEM 241 Organic Chemistry I Fall 4 credits
Prerequisite: a passing grade of 'C' or better in CHEM 122. Recommended for pharmacy, pre-med, clinical lab science, chemistry, chemical engineering, chiropractic, and related fields. Concurrent registration in CHEM 241L is required.

CHEM 241L Organic Chemistry I Lab Fall 1 credit
Organic synthesis and functional group analysis. One three-hour lab session per week. Concurrent registration in CHEM 241 is required.

CHEM 242 Organic Chemistry II Spring 4 credits
Prerequisite: a passing grade of 'C' or better in CHEM 241. Continuation of CHEM 241. Recommended for pharmacy, pre-med, clinical lab science, chemistry, chemical engineering, chiropractic, and related fields. Concurrent registration in CHEM 242L is required.

CHEM 242L Organic Chemistry II Lab Spring 1 credit
More advanced aspects of organic laboratory operations and synthesis. Analysis and structure determination using spectroscopic techniques. One three-hour lab session per week. Concurrent registration in CHEM 242 is required.

CHEM 294 Independent Study 1-3 credits
Independent or directed study of special topics in chemistry. Department chairperson approval required.

CHEM 299 Special Topics in Chemistry BD 1-3 credits
Repeatable up to six semester hours. An examination of special topics in chemistry.

CHEM 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

CHEM 197-297 Cooperative Education/Internship F&S SM 1-3 credits each
Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

CIVIL ENGINEERING AND SURVEYING TECHNOLOGY (CT)

SEE ENGINEERING

COMMUNICATION (COMM)

SEE SPEECH COMMUNICATION AND JOURNALISM

COMPUTER INFORMATION SYSTEMS (CIS)

CIS 102 Computer Software Applications-Word F&S 3 credits
Provides hands-on operation of personal computers with the word processing software, Microsoft Word. Students should have keyboarding skills before enrolling in the class. This class prepares students to take the Word section of the Microsoft Office Specialist exam. Students will need access to Word 2010 software for this course. The program is included in the Office 2010 suite. The software is available through the BSC Bookstore at academic pricing. The software is also located on campus in most computer labs. The MOS exam is required for completion of the course, and lab fees are the student's responsibility. Final grade is not based upon whether student passes or fails MOS exam.

CIS 104 Microcomputer Database F&S 3 credits
This is an introduction to the planning, design and programming of database systems using software designed for database management, Microsoft Access. Students should have keyboarding skills before enrolling in this class. This class prepares students the Access section of the Microsoft Office Specialist exam. Students will need access to Access 2010 software for this course. The program is included in the Office 2010 suite. The software is available through the BSC Bookstore at academic pricing. The software is also located on campus in most computer labs. The MOS exam is required for completion of the course, and lab fees are the student's responsibility. Final grade is not based upon whether student passes or fails MOS exam.

CIS 105 Microcomputer Spreadsheets F&S SM 3 credits
Provides hands-on operation of personal computers using Microsoft Excel. Students should have keyboarding skills before enrolling in class. This class prepares students to take the Excel section of the Microsoft Office Specialist exam. Students will need access to Excel 2010 software for this course. The program is included in the Office 2010 suite. The software is available through the BSC Bookstore at academic pricing. The software is also located on campus in most computer labs. The MOS exam is required for completion of the course, and lab fees are the student's responsibility. Final grade is not based upon whether student passes or fails MOS exam.

CIS 107 Linux Fundamentals F&S 3 credits
This course introduces students to the Linux operating system. It will provide practical skills in using Linux commands and utilities, including editors and file system management. This course prepares students for numerous industry-standard Linux certifications.

CIS 128 Microcomputer Hardware F&S 3 credits
Students learn the functionality of hardware and software components as well as suggested best practices in maintenance and safety issues. The students, through hands-on activities and labs, learn to assemble and configure a computer, install operating systems and software, and troubleshoot hardware and software problems. In addition, this course helps students prepare for the CompTIA A+ certification.

CIS 130 Presentations F&S 3 credits
This class provides hands-on production of researching, creating and delivering electronic business presentation projects using Microsoft PowerPoint. Students should have keyboarding skills before enrolling in this class. This class prepares students to take the PowerPoint section of the Microsoft Office Specialist exam. Students will need access to PowerPoint 2010 software for this course. The program is included in the Office 2010 suite. The software is available through the BSC Bookstore at academic pricing. The software is also located on campus in most computer labs. The MOS exam is required for completion of the course, and lab fees are the student's responsibility. Final grade is not based upon whether student passes or fails MOS exam.

CIS 151 Web Foundations Fall 3 credits
Concepts covered include the tasks involved in various Information Technology (IT) job roles, Internet connection methods, Internet protocols, the Domain Name System (DNS), URLs, customization of Web browsers, plug-ins, e-mail, search engines, security and project management. Course prepares students to write the Internet Business Associate exam. This exam is required and students will be assessed an exam fee. Final grade is not based on whether student passes or fails certifications.

CIS 152 Cascading Style Sheets Spring 3 credits

Students will learn how to format Web pages using Cascading Style Sheets (CSS). Concepts covered are the anatomy of a CSS rule, inline, embedded and external style use, contextual selectors, classes, ids, pseudo-classes, font and text properties, style inheritance, the box model, and basic and advanced page layout. Prerequisite: CIS 154 or CIS 230 or instructor's consent.

CIS 154 Web Design Theory Fall 3 credits

Students will learn how to create and manage their own Web pages using Hypertext Markup Language (HTML), Extensible HTML (XHTML), and CSS. Students will learn to write code manually, as well as use graphical user interface (GUI) authoring tools. Students will further learn the importance of marketing and implementing fundamental design concepts along with validating their HTML or XHTML code. This course will introduce students to the complete planning and design phases of good web design. Topics include planning phases, color choices, interactivity, branding, cultural concerns, navigation, accessibility and planned maintenance for proper web design. Course prepares students to write the Site Development Associate exam. This exam is required and students will be assessed an exam fee. Final grade is not based on whether student passes or fails certifications.

CIS 164 Networking Fundamentals I F&S 4 credits

This course focuses on network terminology and protocols, LANs, WANs, the OSI model, cabling, cabling tools, routers, IP addressing, and network standards. The first of four courses leading to the Cisco Certified Network Associate (CCNA) certification.

CIS 165 Networking Fundamentals II F&S 4 credits

This course introduces the architecture, components, and operation of routers, and principles of routing and routing protocols. Students will learn the primary routing protocols RIP, EIGRP, and OSPF. The second of four courses leading to the Cisco Certified Network Associate (CCNA) certification. Prerequisite: CIS 164 or instructor approval.

CIS 202 Advanced Software Applications Spring 3 credits

Provides hands-on experience with the powerful integration capabilities of the Microsoft Office suite. Students enrolled in this course must have access to Microsoft Office 2010, specifically Word, Excel, Access, and PowerPoint for the duration of the entire course. Required software MAY NOT BE included with the textbook; required software may be a separate purchase. Required software is available in selected BSC computer labs for student use. Prerequisite/Co-requisite: CIS 102, CIS 104, CIS 105 and CIS 130.

CIS 204 Database Design and Structured Query Language (SQL) F&S 3 credits

This course provides students with a foundation in database theory and provides the technical skills required to write basic SQL queries.

CIS 206 Database Implementation and Administration BD 3 credits

This course provides students with the knowledge and skills required to install, configure, administer, and troubleshoot client-server database management systems.

CIS 208 Database Programming BD 3 credits

This course provides students with the technical skills required to program a database solution, using stored procedures, SQL, and proper database design principles. Prerequisite: CIS 204.

CIS 209 Data Warehousing BD 3 credits

This course provides students with the technical skills required to plan, implement, and maintain a data warehouse. Prerequisite: CIS 208.

CIS 210 Desktop Publishing Fall 3 credits

A layout and design course using Adobe Creative Suite software to produce a variety of desktop publishing application projects. Students should have keyboarding and word processing skills before enrolling in this class. Students enrolled in this course must have access to the required software listed in the syllabus for the duration of the course. Required software MAY NOT BE included with the textbook; required software may be a separate purchase. Required software is available in selected BSC computer labs for student use.

CIS 211 Database Programming Project BD 3 credits

This course requires students to produce a comprehensive database programming project. Design issues, implementation, and database troubleshooting will be discussed. Prerequisite: CIS 208.

CIS 212 Microsoft Windows Operating System Client F&S 3 credits

The course helps learners to gain the knowledge and skills to install, configure, customize, optimize, and troubleshoot the Microsoft Windows operating system in a stand-alone and network environment. Windows 7 is the current focus of the class. This course leads to the Microsoft Certified Technology Specialist (MCTS) and Microsoft Certified IT Professional (MCITP) certifications.

CIS 213 Implementing Microsoft Windows Server Applications F&S 3 credits

This course introduces the learner to the Microsoft Windows Server and the application server technologies it supports. Windows Server 2008 is the current focus of the class. This course leads to the Microsoft Certified Technology Specialist (MCTS) and Microsoft Certified IT Professional (MCITP) certifications.

CIS 214 Implementing Microsoft Windows Active Directory Infrastructure F&S 3 credits

This course provides students with the knowledge and skills necessary to install, configure, and administer Microsoft Windows Active Directory services. The course also focuses on implementing Group Policy and performing the Group Policy-related tasks that are required to centrally manage users and computers. Windows Server 2008 is the current focus of the class. This course leads to the Microsoft Certified Technology Specialist (MCTS) and Microsoft Certified IT Professional (MCITP) certifications. Prerequisite: CIS 216.

CIS 215 Implementing Microsoft Windows Server Environment F&S 3 credits

This course introduces the learner to Microsoft Windows Server and the networking technologies it supports. The learner will become familiar with networking and operating system concepts and the common tasks required to administer and support the Microsoft Windows operating system in a network environment. Windows Server 2008 is the current focus of the class. This course leads to the Microsoft Certified Technology Specialist (MCTS) and Microsoft Certified IT Professional (MCITP) certifications. Prerequisite: CIS 216.

CIS 216 Implementing a Microsoft Windows Network Infrastructure F&S 3 credits

This course is for professionals who will be responsible for configuring, managing, and troubleshooting a network infrastructure that uses the Microsoft Windows Server products. These tasks include implementing routing; implementing, managing, and maintaining Dynamic Host Configuration Protocol (DHCP), and Domain Name System (DNS); and implementing a network access infrastructure by configuring the connections for remote access clients. Windows Server 2008 is the current focus of the class. This course leads to the Microsoft Certified Technology Specialist (MCTS) and Microsoft Certified IT Professional (MCITP) certifications.

CIS 221 Networking Essentials Fall 3 credits

This course introduces students to the concepts and terminology of data communications, local area and wide area networks, communications hardware, standards, media, signaling concepts, data communication, error prevention, detection and correction. Course prepares students to write the Network Technology Associate exam. This CIW exam is required and students will be assessed an exam fee. Final grade is not based on whether student passes or fails certification.

CIS 223 Linux System Administration F&S 3 credits

This course covers command line and graphical administration of Linux computer systems. Topics covered include installation, user management, process management, software management, network configuration, and other system configuration tasks. This course prepares students for numerous industry-standard Linux certifications. Prerequisite: CIS 107 or instructor approval.

CIS 226 Linux Network and Security Administration F&S 3 credits

This course covers common Linux networking services, installation, and configuration. Students will learn to configure and administer a Linux system to support common network services and discuss methods to alleviate security problems on a Linux system. Students will learn to configure and administer Linux systems with security in mind. This course prepares students for numerous industry-standard Linux certifications. Prerequisite: CIS 223.

CIS 230 Electronic Publishing Fall 3 credits

Students will use Adobe Dreamweaver, Flash and Fireworks in this course. Dreamweaver concepts include working with text, images, graphics, links, tables, and publication of websites. Flash concepts include creating objects, working with symbols and interactivity and creating animations and special effects. Fireworks concepts include working with objects and importing, selecting and modifying graphics. Students enrolled in this course must have access to the required software listed in the syllabus for the duration of the course. Required software MAY NOT BE included with the textbook; required software may be a separate purchase. Required software is available in selected BSC computer labs for student use.

CIS 231 Search Engine Optimization (SEO) Fall 3 credits

Students will learn the basic principles of optimizing websites for improved performance in search engine results, ultimately enhancing the marketability of their website products and/or services. Students will further develop a basic understanding of the history of search engines, differences in search engine and directory results, and applied practices in structuring HTML and page content to increase the website's visibility to the consumer. Prerequisite: CIS 154 or CIS 230, and ENGL 110 or instructor's consent.

CIS 233 Vector Graphics and Web Animation Spring 3 credits

Students will learn how to create websites using Adobe Flash. Concepts covered include animation, tweening, layers, guides, masks, symbols, publishing movies, and ActionScript. Students enrolled in this course must have access to the required software listed in the syllabus for the duration of the course. Required software MAY NOT BE included with the textbook; required software may be a separate purchase. Required software is available in selected BSC computer labs for student use.

CIS 235 CIW Database Design Methodology Fall 3 credits

CIW Database Design Methodology teaches students how to plan and design relational databases. Students will learn about the theory behind relational databases, relational database nomenclature, and relational algebra. This course includes sections on Structured Query Language (SQL) and optimizing databases through normalization. Students will apply their knowledge with hands-on labs designed to teach the intricacies of database design methodology. Course prepares students to write the CIW Database Design Specialist Exam. This CIW exam is required and students will be assessed an exam fee. Final grade is not based on whether student passes or fails certification.

CIS 250 Advanced Web Design Fall 3 credits

Students will learn how to add JavaScript to their Web pages. Concepts covered include variables, expressions, functions, methods, objects, events, control structures, windows, forms, frames and cookies.
Prerequisite: CIS 154 and CSCI 122 or instructor's consent.

CIS 251 Site Design Spring 3 credits

This course focuses on theory, design and Web construction, along with information architecture concepts, Web project management, scenario development and performance evaluations. Students will further learn how to create and manage Web sites with tools such as Microsoft Expression Web, Adobe Dreamweaver, Fireworks and Flash, Dynamic HTML, and various multimedia and CSS standards. Students will also implement the latest strategies to develop third-generation Web sites, evaluate design tools, discuss future technology standards, and explore the incompatibility issues surrounding current browsers. This course provides a balance of training in theory, technology, project management, and hands-on development.
Course prepares students to write the CIW Web Design Specialist Exam. This CIW exam is required and students will be assessed an exam fee. Final grade is not based on whether student passes or fails certification.
Prerequisite: CIS 151, CIS 154 and CIS 230.

CIS 252 XML Spring 3 credits

This course will introduce students to Extensible Markup Language (XML). Concepts covered include document type definitions (DTDs), schemas, and namespaces. Other topics covered include the use of XML in application software, such as Microsoft Office suite. Prerequisite: CIS 154 and CIS 104, or CIS 235 or instructor's consent.

CIS 253 PHP Spring 3 credits

Students will learn how to design dynamic, data-driven Web pages using server-side scripting. Prerequisite: CIS 154 and CIS 250 or instructor's consent.

CIS 254 CIW E-Commerce Strategies and Practices Spring 3 credits

During this course, students will be taught the concepts of e-commerce and doing business online, including technical concerns and differences from traditional commerce.
Course prepares students to write the CIW E-commerce Specialist exam. This CIW exam is required and students will be assessed an exam fee. Final grade is not based on whether student passes or fails certification.
Prerequisite: CIS 251.

CIS 255 Computer and Network Security F&S 3 credits

This course introduces students to computer and network security topics, including cryptography, authentication, VPNs, and other aspects of enterprise security. Networking and operating system knowledge recommended before taking this course.

CIS 256 Web Portfolio Spring 3 credits

This course provides an opportunity for a student to receive unique work experience in Web design and development through creating websites for non-profit organizations or businesses. Prerequisites: CIS 152, CIS 154, CIS 231 and CIS 251.

CIS 267 Intermediate Networking I F&S 4 credits

This course teaches the technologies and protocols needed to design and implement a converged switched network. Students learn about the hierarchical network design model. Students also learn to implement VLANs, VTP, STP, and Inter-VLAN routing. The third of four courses leading to the Cisco Certified Network Associate (CCNA) certification. Prerequisite: CIS 164 or instructor approval.

CIS 268 Intermediate Networking II F&S 4 credits

This course focuses on WAN technologies and services required by converged applications in enterprise networks. Students learn to implement and configure common data link protocols and to apply WAN security concepts, traffic principles, access control, and addressing services. The fourth of four courses leading to the Cisco Certified Network Associate (CCNA) certification. Prerequisite: CIS 165 and CIS 267, or instructor approval.

CIS 269 Network Architecture and Design F&S 3 credits

A capstone course for the Computer Support Specialist program, this class teaches network and security design principles as they apply to Information Technology projects. Significant hands-on work with an IT project is required for this class. It is recommended that students take this course during their last semester in the Computer Support Specialist program.

CIS 270 Implementing IP Routing BD 4 credits

This course teaches students to implement, monitor, and maintain routing services in an enterprise network. Students will learn to plan, configure, and verify the implementation of complex enterprise LAN and WAN routing solutions, using a range of routing protocols in IPv4 and IPv6 environments. The course also covers the configuration of secure routing solutions to support branch offices and mobile workers. Comprehensive labs emphasize hands-on learning and practice to reinforce configuration skills. The first of three courses leading to the Cisco Certified Professional (CCNP) certification. Prerequisite: CIS 268, CCNA certification, or instructor approval.

CIS 272 Implementing IP Switching BD 4 credits

This course teaches students to implement, monitor, and maintain switching in converged enterprise campus networks. Students will learn to plan, configure, and verify the implementation of complex enterprise switching solutions. The course also covers the secure integration of VLANs, WLANs, voice, and video into campus networks. Comprehensive labs emphasize hands-on learning and practice to reinforce configuration skills. The second of three courses leading to the Cisco Certified Professional (CCNP) certification. Prerequisite: CIS 268, CCNA certification, or instructor approval.

CIS 273 Maintaining and Troubleshooting IP Networks BD 4 credits

This course teaches students to monitor and maintain complex, enterprise routed and switched IP networks. Skills learned include the planning and execution of regular network maintenance, as well as support and troubleshooting using technology-based processes and best practices, based on systematic and industry recognized approaches. Extensive labs emphasize hands-on learning and practice to reinforce troubleshooting techniques. The third of three courses leading to the Cisco Certified Professional (CCNP) certification. Prerequisites: CIS 270 and 272, or instructor approval.

CIS 294 Independent Study 1-3 credits

Independent or directed study of topics in computer information systems. Department chairperson approval is required.

CIS 195-295 Service Learning 1-3 credits

Repeatable up to six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

CIS 197-297 Cooperative Education/Internship 1-3 credits

Repeatable up to six semester hours. Students get on-the-job experience under qualified supervision in computer applications, office technology, and network administration occupations. Work hours are arranged by the employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student-advisor conferences are held to discuss progress and/ or problems. All co-op/internship experiences are graded on a satisfactory/ unsatisfactory basis. Department chairperson approval is required.

CIS 299 Special Topics in Computer Information Systems BD 1-3 credits

Repeatable up to six semester hours. An examination of special topics in computer information systems.

COMPUTER SCIENCE (CSCI)

CSCI 101 Introduction to Computers F&S 3 credits

Introduces students to general computer topics such as input and output devices, the computer's impact on society, programming languages and software. Includes hands-on experience in word processing, spreadsheets, data management and presentations.

CSCI 122 Beginning Visual Basic F&S 3 credits

A course in writing programs using the Visual Basic language for students with no previous experience with a programming language, but some experience with a computer.

CSCI 124 Beginning C++ F&S 3 credits

Introduction to programming in the C++ language for students with some programming experience in another language. Prerequisite: Computer Science 160. Co-requisite: Computer Science 161.

CSCI 125 Beginning Cobol 3 credits

An introduction to computer programming and computer applications. Prerequisite: CSCI 122.

CSCI 127 Beginning Java 3 credits

An introduction to the Java programming language for students with some programming experience in another language. Covers Java syntax, applets, and applications.

CSCI 160 Computer Science I F&S 4 credits

Systematic development of algorithms and programming structure with an emphasis on problem solving and design. The use of good programming style to aid in designing, coding, and debugging programs. Includes use of a structured high level language. Primarily for those who plan to major or minor in Computer Science or Computer Support Specialist. Prerequisite: CSCI 122 or equivalent.

CSCI 161 Computer Science II Spring 4 credits

Advanced concepts in computer science, including the Software Life Cycle, data structures, thread processing, hashing, and Graphical User Interfaces. Prerequisite: Computer Science 160.

CSCI 172 Intermediate Visual Basic
Spring 3 credits

This course is a continuation of Beginning Visual Basic. Topics include arrays, random-access files, graphics, and database management. Prerequisite: CSCI 122.

CSCI 240 Advanced Cobol 3 credits

A continuation of CSCI 125. Students will work with the advanced features of the COBOL language, including creating, sorting and maintaining indexed files, writing sub-programs and work hexadecimal file dumps. Each student will design, code, test, and document a system consisting of several programs and files with complex formatted output. Prerequisite: CSCI 122 and 125.

CSCI 250 Assembly Language Fall 3 credits

This course includes a study of machine and assembly language concepts, programming in assembly language, and assembly subroutines called from a high-level language. Prerequisite: Computer Science 160 or consent of instructor.

CSCI 270 Computer Organization Spring 3 credits

The structure and organization of computer hardware, includes creating a simulated digital computer system to illustrate the mechanics of information transfer and control. Prerequisite: Computer Science 160. Co-requisite: Computer Science 161.

CSCI 294 Independent Study 1-3 credits

Independent or directed study of special topics in computer science. Department chairperson approval is required.

CSCI 299 Special Topics in Computer Science
BD 1-3 credits

Repeatable up to six semester hours. An examination of special topics in computer science.

CSCI 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

CSCI 197-297 Cooperative Education/Internship
F&S SM 1-3 credit hours each

Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

CRIMINAL JUSTICE (CJ)

CJ 170 Introduction to Security BD 3 credits

The history, nature and scope of private security in modern society; the basic principles of physical security, internal loss prevention, defensive systems, fire prevention and safety; the security function in the corporate structure; operations and career opportunities exemplified in such specific areas as retail, hospital, cargo and computer security services, contract or proprietary.

CJ 171 Internal Theft Investigation and Control
BD 3 credits

How and why employee theft occurs in its many forms, and its impact on business. Internal theft controls, including pre-employment screening, honesty testing, management's role in preventing internal theft, cash and merchandise controls.

CJ 172 Business and Retail Security BD 3 credits

Differentiation within the entire security system. Trends of business and retail security systems and methodology for providing retail security needs. Detection and control of loss and prevention techniques.

CJ 201 Introduction to Criminal Justice
F&S SM 3 credits

Introduction to Criminal Justice involves the survey of law enforcement: the role, history, development and constitutional aspects of law enforcement and public safety. The course also includes a review of the agencies: police, courts, corrections and others involved in the process and administration of criminal justice.

CJ 210 Introduction to Policing Fall 3 credits

An introduction to the specific field of law enforcement and its responsibilities; including patrol, traffic, investigation, juvenile and special operational units. Federal, State and Local agencies will be reviewed to distinguish their separate roles and coordinating efforts for maximizing the necessary efficiency of law enforcement, as we know it.

CJ 220 Criminal Law Fall 3 credits

Survey of substantive criminal law as a means of attaining certain socially desirable ends like the preservation and protection of life and property; emphasis on historical and philosophical concepts.

CJ 223 Police Administration BD 3 credits

Administration of police line operations; Review principles of various administrative styles for organization and administration of staff functions and activities; including policy, personnel distribution and analysis of operations.

CJ 226 Criminal Investigation Spring 3 credits

Introduction to criminal investigation procedures including theory of an investigation, conduct at crime scenes, collection and preservation of physical evidence; methods used in police science laboratory, fingerprints, ballistics, documents, serology, photography, and related forensic sciences.

CJ 231 Criminal Evidence and Procedure
Spring 3 credits

Deals with rules of evidence of particular import at the operational level in law enforcement and with criminal procedure in important areas such as arrest, force, and search and seizure.

CJ 232 Administration of Justice BD 3 credits

For criminal justice students or laymen; designed to broaden the understanding of the student concerning the various agencies involved in the administration of criminal law. Emphasis is placed upon the more important law enforcement functions and interrelationships from arrest to executive pardon.

CJ 235 Field Experience and Internship
F&S SM 3 credits

Observation and work experience under the direction of a faculty member in a local, county, or state criminal justice agency.

CJ 243 Introduction to Homeland Security
F&S SM 3 credits

This course discusses the historic overview of the events of terrorism that lead to the establishment of the Department of Homeland Security, statutory authority, the organization and reorganization of agencies, weapons of mass destruction, and safety and security to provide for a safe America. Introduction to Homeland Security provides important

and up-to-date information about terrorism, terrorist behavior, homeland security policies and dilemmas, and how to deal effectively with threats and the consequences of attacks.

CJ 254 Juvenile Justice System Spring 3 credits
Special legal status of the juvenile, protective services, the juvenile and family, court movement, and child labor laws. Emphasis on noncriminal aspects of administration of juvenile justice, guardianship, dependency, neglect, child support, paternity and adoption.

CJ 270 Introduction to Corrections Fall 3 credits
Survey of current correctional thought and practices in the United States. Evolution of modern correctional practices in the United States. Overview of correctional treatment in different types of institutions and in the community.

CJ 271 Community Based Corrections Spring 3 credits
Basic concepts, history, legislation and practices used in work with juveniles and adults who have been placed on probation or parole; criteria of selection, methods of supervision, and elements of case reporting.

CJ 294 Independent Study 1-3 credits
Independent or directed study of special topics in criminal justice. Department chairperson approval is required.

CJ 299 Special Topics in Criminal Justice BD 1-3 credits
Repeatable to six semester hours. An examination of special topics in criminal justice.

CJ 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

CJ 197-297 Cooperative Education/Internship F&S SM 1-3 credit hours each
Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

ECONOMICS (ECON)

ECON 105 Elements of Economics F&S 3 credits
Analysis of economic principles for students planning no further study of economics, i.e. non-business majors. No credit for students who have completed Economics 201-202. This course includes the study of factors influencing supply and demand, price determination under different competitive structures, monetary policy, fiscal policy and other factors influencing aggregate levels of income and employment, and selected economic problems.

ECON 201 Principles of Microeconomics F&S SM 3 credits
Open to freshmen. A microeconomic approach to the study of the present economic system; a study of the principles of economics including factors which influence supply and demand, price determination through supply and demand, profit maximization under different economic structures, efficiency, and the capital market.

ECON 202 Principles of Macroeconomics F&S SM 3 credits
Open to freshmen. Prerequisite: Econ 201. Analysis of economic growth and development, aggregate levels of income and employment, inflation, fiscal and monetary policy, and international trade.

ECON 294 Independent Study 1-3 credits
Independent or directed study of special topics in economics. Department chairperson approval is required.

ECON 299 Special Topics BD 1-3 credits
Repeatable to six semester hours. An examination of special topics in economics.

ECON 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

ECON 197-297 Cooperative Education/Internship F&S SM 1-3 credit hours each
Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

EDUCATION (EDUC)

EDUC 250 Introduction to Education F&S 2 credits
A study of teaching as a profession, including historical, philosophical, social and psychological foundations of education. This course also contains a 30 hour preprofessional observational experience in a K-12 classroom. Corequisite: EDUC 298.

EDUC 294 Independent Study 1-3 credits
Independent or directed study of special topics in education. Department chairperson approval is required.

EDUC 298 Pre-Professional Experience F&S 1 credit
Students will be placed with teachers in actual K-12 classes. Students will spend thirty hours observing the teachers in action and will keep journals recording their observations. Students must be enrolled in Education 250 at the same time from the same instructor.

EDUC 299 Special Topics in Education BD 1-3 credits
Repeatable to six semester hours. An examination of special topics in education.

EDUC 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

EDUC 197-297 Cooperative Education /Internship F&S SM 1-3 credit hours each
Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to

submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

ELECTRIC POWER TECHNOLOGY (ELPW) (ENRT)

ENRT 103 Applied Math 3 credits

This course will teach basic math skills and apply those to energy industry situations. Students will learn the metric system, basic volume and area calculations as well as algebra and trigonometry and how they apply to industry specific situations.

ENRT 106 DC Fundamentals 2 credits

(Recommended prerequisite: ENRT 103) This course covers basic direct current theories and applies those theories to the electrical system and related equipment. Students will study methods of producing a voltage, such as batteries, magnetic fields, basic series and parallel circuits. Students will also study DC circuit calculations.

ENRT 108 AC Fundamentals 3 credits

(Recommended prerequisite: ENRT 103, 106) This course covers basic alternating current theories and applies those theories to electrical systems and related equipment. Students will also study basic generator and motor design, construction and operation principles.

ENRT 115 Industrial Composition 2 credits

In this course, students will learn some of the common terminology used in the industry and the proper writing techniques necessary to work within the industry. Students will participate in practical industrial writing scenarios, such as filling out work request orders, electrical switching orders and inter-company memos.

ELPW 101 Basic Computer Skills 3 credits

This course is designed to give students a general understanding of computers, both hardware and software. Students will learn to access the Internet and navigate through their online courses and utilize the system tools. This course will also include a basic study of MS Word, MS Excel and MS Power Point. *Students must have access to current software applications*.

ELPW 105 Electrical System Fundamentals 3 credits

This course will begin with a look at several types of power generation stations, such as large fossil fired power plants, hydroelectric power plants, gas turbine and combined cycle generating stations and finally a brief look at wind generation. After the introduction to power generation, students will study how the power is delivered from the power station to the consumer. This course will cover transmission lines and related components within a typical transmission system, such as step-up and step-down transformers, circuit breakers, disconnects and protective relaying.

ELPW 109 Electrical Industry Safety 3 credits

This course covers the general safety practices and information employees need while working in any segment of the electrical industry, and the Federal Agencies responsible for insuring a safe working environment. Students will also gain an understanding of the Workers Right to Know regulations and gain an awareness of Public Safety issues.

ELPW 110 Basic Print Reading 3 credits

This course gives students an introduction to the different schematics used in power plant operations and electrical transmission and distribution systems. Students will gain an understanding of the standard symbols used in the various systems schematics and how to read them. Students learn how to read basic piping and instrumentation diagrams and how to interpret single line electrical diagrams. Students finish the course by studying electrical system diagrams beginning at the generator and following through to the distribution system.

ELPW 111 Introduction to the Electrical Industry and the Power Grid F&S SM 3 credits

This course will begin with a basic introduction to the systems and components that make up a basic electrical system, including generation, transmission and distribution. You will then study the history behind electrical utility industry. Students will study how the electrical system in the United States was established and how Thomas Edison and George Westinghouse influenced the development of electrical systems. You will also learn how the electrical industry was first regulated and how regulation of the industry has changed. Students will also gain knowledge of how the electrical industry is currently being "re-regulated" to encourage competition. Students will also gain knowledge of the system operations and marketing of electricity. Finally, you will learn how the electrical industry is segmented into utility sectors, such as investor-owned, federally owned, publicly owned and cooperatively owned utilities.

ELPW 112 Electrical System Components 2 credits

This course takes an in-depth look into the components used in the transmission of electricity. Students begin with a study of switchyards and substations and then learn the operation of transformers, circuit breakers, regulators, capacitor banks, tap changers, disconnects, current and potential transformers and lightning arrestors. Students also study the various types of electrical conductors, structures and insulators used in the transmission of electricity. Finally, students learn the components, which make up a typical substation and how it feeds a distribution network that supplies customers with electricity.

ELPW 118 Industrial Communication 2 credits

This course defines the interpersonal skills needed to communicate with co-workers and customers to effectively work within the electrical industry. Students learn the proper methods used to resolve on-the-job conflicts and how to establish positive working relationships with co-workers. Students will evaluate and learn techniques for handling different workplace scenarios. They also will learn what is considered acceptable behavior in the workplace, and how to recognize discrimination and sexual harassment and understand that these behaviors are unacceptable in the industry.

ELPW 200 Advanced Print Reading 3 credits

This course covers advanced electrical prints used to navigate complex electrical systems and feeder maps. Students also study schematics that are used when working with electronic systems and system instrumentation that is used to control and monitor the flow of electricity through the electrical system. Students also learn to use the diagrams to troubleshoot system problems and to safely isolate sections of the electrical system.

ELPW 202 Advanced Industrial Safety 3 credits

This course focuses on specific safety practices used within the industry. Students begin by studying general practices, such as confined space entry, lock-out tag out procedures, fall protection, fire safety and working with hazardous materials. Students also learn some specific safety procedures used by linemen, such as proper bucket truck operation and some techniques used when working with electrical conductors. Finally, students learn some of the specific considerations that must be adhered to as an electrical system dispatcher to ensure the safety of line crews and technicians working on the electrical system.

ELPW 204 Advanced Electrical Systems 3 credits

This course provides students with a complete understanding of the design and operation of an electrical system. Students begin by understanding switchyard construction and the different configurations and also how different sections of the transmission and distribution system can be

safely isolated. Students also learn how storms and conditions can affect the electrical system. In addition, students learn some of the procedures used by system operators and line crews to maintain safe and effective delivery of power during adverse conditions and some of the steps necessary to restore power after outages.

ELPW 206 Electrical System Protection 3 credits

This course covers protection fundamentals, philosophies and principles used to protect the electrical system, beginning with the generator itself. Various types of relays, input sources and system grounding are also covered.

ELPW FOURTH SEMESTER SPECIALIZATION COURSES

LINE CONSTRUCTION SPECIALIZATION

ELPW 250 Transformers 4 credits

This course begins by reviewing basic transformer design and operation. The course also covers 3-phase transformers, single-phase loads for 3-phase transformers, and the connections used in such transformers. The course introduces students to installation procedures and maintenance procedures.

ELPW 230 Underground Line Construction 4 credits

This course covers the two basic categories of underground line construction, such as direct burial and those found in vaults and ducts. Students learn the design, conductors and the transformers used in residential direct burial and the factors that affect it. The course includes underground line construction design and the factors that affect this type of installation.

ELPW 210 Overhead Transmission & Distribution Line Construction 4 credits

This course covers the design and construction of transmission and distribution overhead lines. This includes structures, conductors, insulators and the factors that influence particular use for both transmission and distribution systems. The course covers guidelines for working safely with poles, conductors, switchgear, transformers, rigging, grounds and more. Students will be introduced to high and low voltage troubleshooting procedures, stringing procedures and guidelines for live line work. Maintaining good voltage to the customer and street lightning issues also will be discussed.

SUBSTATION SPECIALIZATION

ELPW 251 Substation Construction & Maintenance 4 credits

This course begins with a review of hand and power tools used during the construction and maintenance of substations and continues with safety procedures and equipment put in place to protect workers within a substation. Students learn the basic construction of a substation, including electrical equipment rigging and installation, cable tray and conduit installation, cable controls and panel wiring, as well as a wide variety of installation procedures for electrical components and protection equipment.

ELPW 211 Substation Relays 4 credits

This course focuses on testing and calibrating substation equipment, including voltage testing on equipment feeder relays, and circuit breaker relays. Students also learn the various tests that need to be conducted on protective relays, such as overcurrent and voltage relays, directional and line relays, as well as ground and test device testing.

ELPW 231 Substation Operations 4 credits

This course details the design and operation components that make up a typical substation, such as transformers, circuit breakers, instrument transformers, disconnect switches, automatic reclosers, reactors and regulators. Students will also gain an understanding of the relay protection designed to protect the substation, transmission and distribution systems in the event of a fault. Students also learn some of the routine checks made on substation equipment, such as monitoring nitrogen gas levels on transformers and the correct method of changing bottles as well as identifying alarms and knowing when to reset alarms and trips. This course also includes information on SF6 equipment.

SYSTEM DESIGN SPECIALIZATION

ELPW 208 Advanced Math 4 credits

This course will cover algebra, geometry and trigonometry needed for energy technicians working in the electrical system design and metering specialization areas. The course will cover the fundamental concepts of algebra, equations, functions and graphs. The course also will cover trigonometric functions, laws of sines and cosines, and vectors. Lastly the course will discuss analytic geometry.

ELPW 212 System Design Basics 3 credits

This course covers the basic principles and applications of electric distribution design and application. It includes design layout, electric distribution components, and apparatuses that are used to provide service to a wide variety of customers requesting electric distribution power from single phase to three-phase voltages that are classified as electrical distribution service. It includes basic principles such as tariffs, permitting for new construction, and distribution projects that may be classified as overhead or underground service routing.

ELPW 232 System Design Analysis 3 credits

This course covers the process calculations involved with distribution system design.

ELPW 252 Civil Design 2 credits

This course covers the basic principles of civil design in application to electrical distribution systems, including drafting and surveying techniques and computer-aided design systems.

METERING SPECIALIZATION

ELPW 208 Advanced Math 4 credits

This course will cover algebra, geometry and trigonometry needed for energy technicians working in the electrical system design and metering specialization areas. The course will cover the fundamental concepts of algebra, equations, functions and graphs. The course also will cover trigonometric functions, laws of sines and cosines, and vectors. Lastly the course will discuss analytic geometry.

ELPW 213 Fundamentals of Metering 3 credits

This course introduces students to the fundamentals of metering, such as terminology and basic principles of meters. Students learn basic math needed in metering, and review basic electricity and magnetism principles. They are introduced to meter testing equipment, meter diagrams and standards, and learn technical data and how to read watt hour and demand meters.

ELPW 233 Single-Phase & Polyphase Metering 3 credits

In this course students learn about single-phase metering and polyphase metering, including meter design, adjustments and compensations, and applications. They also learn about power factor analyzers, high amperage CT cabinets, meter demand theory, demand registers, and testing and maintenance of thermal demands.

ELPW 253 Advanced Metering Technology 2 credits

In this course, the student will study various metering system designs and application options. The course opens with a comprehensive review of instrument transformers in the many forms they take to serve a wide array of specialized applications. Subsequent topics will include ratio, burden and correction factor calculations; functional testing and calibration procedures. Also included are troubleshooting and maintenance procedures as well as safe installation procedures.

ELECTRICAL ENGINEERING (EE)

SEE ENGINEERING

ELECTRICAL TRANSMISSION SYSTEMS TECHNOLOGY (ETST)

ENRT 104 Electrical Fundamentals F&S 3 credits

This course includes a study of electrical fundamentals, basic electrical theory, the properties of voltage and current and electrical terminology. Series and parallel circuits and a understanding of Ohms Law are included in this course. The design and operation of electrical motors, generators, transformers and circuit breakers and their applications in the energy industry are included. An understanding of the different devices used to control and protect equipment and circuits are included in this course.

ENRT 106 DC Fundamentals 2 credits

This course covers basic direct current theories and applies those theories to the electrical system and related equipment. Students will study methods of producing a voltage, such as batteries, magnetic fields, basic series and parallel circuits. Students will also study DC circuit calculations.

ENRT 108 AC Fundamentals 3 credits

This course covers basic alternating current theories and applies those theories to electrical systems and related equipment. Students will also study basic generator and motor design, construction and operation principles.

ETST 240 Power Industry Concepts 3 credits

This course covers the basic role system operators and electrical dispatchers play in the electric power industry. In addition, students will study the history, development and evolution of the electric industry since inception. This course also explores the effects of deregulation of modern day electrical markets. This course concludes with the working environment of system operators, including some of the challenges they face, such as shift work, certification and the tremendous amount of responsibility operating in a real time market.

ETST 242 Applied Mathematics for System Operators 2 credits

This course is designed to provide a review of basic mathematical concepts required for work as an electrical transmission systems operator. In addition to basic mathematics, students will study basic trigonometry, vectors and phasors and the relationship these mathematical functions have to work as a system operator.

ETST 250 Electrical Generation Theories 4 credits

This course covers the design and construction of large electrical generators. Students will study the sources of voltage and the design and types of A.C. and D.C. generators and related auxiliary equipment. Students will also study the design and operation of A.C. and D.C. motors.

ETST 254 System Elements I-Substations 3 credits

This course covers the basic equipment found in switchyards and substations. Also included are the functions and types of substations, related transmission and distribution systems and how each system is tied to one another.

ETST 256 System Elements II-Transformers 3 credits

This course builds upon System Elements I by introducing basic diagrams, transformers, switching and basic substation safety and inspection. Topics covered in this course will include interpreting one-line diagrams, exploring power and specialty transformers, the six basic steps of switching and lock-out/tag-out (LOTO) procedures.

ETST 258 System Elements III-Protective Relaying 3 credits

As the last of the System Elements courses, this course will focus on protective relaying of substation equipment and transmission lines. Details found in this course include practical understanding and identification of protective and control equipment, zones of protection, protection schemes, and relay communication systems.

ETST 260 Electrical Diagram Interpretation 2 credits

This course will cover electrical diagrams including single line diagrams, schematic diagrams and logic diagrams. This course will focus on the system operator's perspective and the role diagram comprehension plays in an operator's job performance.

ETST 262 Power System Operations 3 credits

This course will cover the basic roles and responsibilities of system operators including transmission operations, market operations, reliability, balance and interchange and scheduling. The goal of this course is to introduce the multitude of positions found in a typical transmission control center.

ETST 266 Interconnected System Operations 3 credits

This course will cover the operation of power pools, regional reliability organizations and independent system operators and the role of each. In addition, this course covers interconnected switching procedures between utilities.

ETST 268 Power Flow 3 credits

In this course, students will study the control of power flow through interconnected systems and the operation of parallel power systems. The topics will include generator synchronization, phase angle, VAR control and line voltage regulation. Procedures for controlling electrical power flows to maintain steady state conditions across the power grid will also be a focus of this course.

ETST 270 System Operator Work Practices 3 credits

In this course students will learn the role a system operator plays in the delivery of power and the operation and maintenance of the transmission system. Students will learn what is expected of a system operator including desired personal characteristics, working environment, employer's expectations/qualifications, educational and training requirements, certification requirements, role in performing reliability functions, tasks and duties and behavior required under code of conduct and other regulatory and legislative orders.

ETST 272 Power System Safety 3 credits

This course will cover the safe operating practices, system isolation procedures, and accident prevention procedures used in the transmission and distribution of power. Emphasis will be placed on electrical system lock out and safety procedures.

ETST 274 Communication and Control Technology 2 credits

This course covers the theory and application of various communications technologies used in the electric industry.

ETST 276 Power System Economics 3 credits

This course covers economic factors governing electrical system operations. Costs of generation, transmission and distribution will be explained. The organization of markets for electrical energy and how this structure affects participating companies' operational and investment decisions will be presented and discussed. The effects of congestion, transmission losses and penalty factors will be studied. Load management, scheduling and pricing will be a focus as well.

ETST 278 Power System Emergency Concepts 3 credits

This course is designed to concentrate on recognition of and reaction to power system emergencies, and the implementation and coordination of proper procedures to restore the electrical system to a safe operating condition. Learners will study substation bus configurations and the protection schemes used to respond to emergencies within the electrical system. Effective and safe restoration of system operation through proper switching procedures will also be described.

ETST 280 Reliability Policies and Procedures 3 credits

This course is designed to familiarize and help the student understand the policies and procedures that ensure the reliability of the power system. North American Electric Reliability Corporation (NERC) standards, as well as other regulatory agency policies, will be explained and discussed. Government agencies, reliability regions, and state reliability concerns will also be defined and discussed.

ELECTRONICS/TELECOMMUNICATIONS TECHNOLOGY (ELEC)

ELEC 100 Direct Current Analysis Fall 4 credits

The study of the concepts of current, voltage and resistance through problem solving and schematic drawings as they apply to DC circuits analysis. Concurrent registration in, or previous successful completion of, the associated lab is required.

ELEC 100L Direct Current Analysis Lab Fall 1 credit

The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. Concurrent registration in, or previous successful completion of the associated lecture is required.

ELEC 114 Digital Electronics I Fall 3 credits

The study of number systems, logic gates, Boolean algebra, combination logic circuits. Concurrent registration in, or previous successful completion of, the associated lab is required

ELEC 114L Digital Electronics I Lab Fall 1 credit

The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. Concurrent registration in, or previous successful completion of the associated lecture is required.

ELEC 115 Digital Electronics II Spring 3 credit

Prerequisites: ELEC 100, 100L, 114, 114L, 118, and 118L or equivalent and approval of instructor. The study of arithmetic circuits, code converters, decoders, encoders, multiplexers, demultiplexers, multivibrators, and flip-flops. Concurrent registration in, or previous successful completion of, the associated lab is required.

ELEC 115L Digital Electronics II Lab Spring 1 credit

The lab portion of the course is a lab/lecture, which provide hands-on verification of the theory presented in class. Concurrent registration in, or previous successful completion of the associated lecture is required.

ELEC 118 Solid State Devices Fall 4 credits

The study of semiconductor physics, fundamentals of semiconductors, power supplies, transistors, characteristics of biasing circuits, amplifier properties, and FET characteristics and applications. Concurrent registration in, or previous successful completion of, the associated lab is required.

ELEC 118L Solid State Devices Lab Fall 1 credit

The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. Concurrent registration in, or previous successful completion of the associated lecture is required.

ELEC 120 AC Analysis Spring 4 credits

Prerequisites: ELEC 100, 100L, 114, 114L, 118, and 118L or equivalent and approval of instructor. The study of dB, complex numbers, RC, RI, and RLC circuits, resonance, and passive and active filters. Concurrent registration in, or previous successful completion of, the associated lab is required.

ELEC 120L AC Analysis Lab Spring 1 credit

The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory, presented in class. Concurrent registration in, or previous successful completion of the associated lecture is required.

ELEC 130 Active Devices Spring 4 credits

Prerequisites: ELEC 100, 100L, 114, 114L, 118, and 118L or equivalent and approval of instructor. The study of various electronic devices and circuitry including; Thyristors, Operational Amplifiers, and Regulated Power supplies. Concurrent registration in, or previous successful completion of, the associated lab is required.

ELEC 130L Active Devices Lab Spring 1 credit

The lab portion of the course a lab/lecture, which provides hands-on verification of the theory, presented in class. Concurrent registration in, or previous successful completion of the associated lecture is required.

ELEC 216 Digital Electronics III Fall 4 credits

Prerequisite: Completion of first year Electronics/Telecommunications Technology program, or equivalent and instructors approval. An extension of Digital II ELEC 115, a study of advanced integrated circuits. Topics covered are registers, processors, memory and a study of microcontrollers. Each student will have a laptop and a BASIC STAMP microcontroller which will be used as a training tool for interfacing devices in a digital world. Concurrent registration in, or previous successful completion of, the associated lab is required.

ELEC 216L Digital Electronics III Lab Fall 1 credit

Prerequisite: Completion of first year Electronics/Telecommunications Technology or instructor's approval. The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. Concurrent registration in, or previous successful completion of the associated lecture is required.

ELEC 218 Digital Electronics IV Spring 3 credits

Prerequisite: ELEC 216 and ELEC 216L or equivalent and instructor's approval. A continuation of Digital III ELEC 216. Students will become familiar with the architecture, programming, application and troubleshooting of micro-controller circuits. A to D and D to A converters are covered. Basic data acquisition theory and practices are also discussed. The BASIC STAMP will be used to interface with mechanical and optical switches, remote radio control and DC motor monitor/control circuits. Concurrent registration in, or previous successful completion of, the associated lab is required.

ELEC 218L Digital Electronics IV Lab Spring 1 credit

Prerequisite: ELEC 216 and ELEC 216L or equivalent and instructor's approval. The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. Concurrent registration in, or previous successful completion of the associated lecture is required.

ELEC 222 Electronic Communications I Fall 4 credits

Prerequisite: Completion of first year Electronics/Telecommunications Technology program, or equivalent and instructors approval. Review of reactive and resonant circuits. Circuits used to generate and detect amplitude modulation. Power, current and voltage relationships in an AM wave. Phase relationship between carrier and sidebands. Circuits used to generate and detect frequency modulation. Power, current and voltage relationships in an FM wave. Phase relationship between carrier and sidebands. Concurrent registration in, or previous successful completion of, the associated lab is required

ELEC 222L Electronic Communications I Lab Fall 1 credit

Corequisite: ELEC 222 or equivalent and instructors approval. The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. Concurrent registration in, or previous successful completion of the associated lecture is required.

ELEC 224 Electronic Communications II Spring 4 credits

Prerequisite: ELEC 222 and ELEC 222L or equivalent and instructors approval. Topics covered are digital communications, basic local area networks, cellular telephone, transmission lines, antennas and fiber optics. Concurrent registration in, or previous successful completion of, the associated lab is required

ELEC 224L Electronic Communications II Lab Spring 1 credit

Prerequisite: ELEC 222 and ELEC 222L. Corequisite: ELEC 224 or instructor's approval. The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. Concurrent registration in, or previous successful completion of the associated lecture is required or instructors approval.

ELEC 232 Telecommunications I Fall 4 credits

Prerequisite: Completion of first year Electronics/Telecommunications Technology or instructor's approval. This course is involved with the introduction of a basic telephone local loop and the tests that are performed on it. The local loop being a basic series DC circuit allows students not only an introduction into the access circuit but allows for a good review of basic DC circuits in a real world application. Students will use specialized test equipment to perform measurements of voltage, current, resistance, capacitance, and noise and circuit length. Students will also be introduced to cable location and ground fault location. An outdoor practice field is used for the student's hands-on tasks. Additional topics covered are the Public Switched Telephone Network, customer premise equipment, analog and digital transmission. Concurrent registration in, or previous successful completion of the associated lab is required.

ELEC 232L Telecommunications Lab I Fall 1 credit

Prerequisite: Completion of first year Electronics/Telecommunications Technology program, or equivalent and instructor's approval. The lab portion of the course is a lecture/lab that provides hands-on verification of the theory and concepts presented in the lecture class. Activities include underground cable location, cable ground fault location, determining the length of a line using a subscriber loop test set using the capacitance method and using a time domain reflectometer. Line and cable color code are also covered. Concurrent registration in or previous successful completion of the associate lecture is required or instructor's approval.

ELEC 234 Telecommunications II Spring 4 credit

Prerequisite: ELEC 232 and ELEC 232L or instructor's approval. This course is involved with the introductory study of newer technologies other that the plain old telephone service. Topics covered are signal system 7, T carrier, packet switching, FTTx, PON, VOIP, LAN topologies, IPv4, IPv6 and Ethernet. Concurrent registration in or previous successful completion of the associate lab is required or instructor's approval.

ELEC 234L Telecommunications Lab II Spring 1 credit

Prerequisite: ELEC 232 and ELEC 232L or instructor's approval. The lab portion of the course is a lecture/lab that provides hands-on practice opportunities for the students in the following areas. Connectorizing and testing of Ethernet copper cable. Connectorizing and testing of adhesive, crimp-on and fuse-on fiber optic connectors. Mechanical splicing, fusion splicing and testing of fiber optic cable. Students will become familiar with the operation and use of the following test equipment. Subscriber loop analyzer including a time domain reflectometer, cable locator and fault finder for copper cable. OTDR, visual fault locator, calibrated light source/power meter, fusion splicer and connector microscope for fiber cable. The students will work on a simulated telephone system that is comprised of two PBXs' with both analog and VOIP capabilities. The students will also work on a FTTx system that transports data through a PON to each lab bench. Students will perform systems checks and troubleshooting on both systems. Concurrent registration in or previous successful completion of the associate lecture is required or instructor's approval.

ELEC 294 Independent Study 1-3 credits

Independent or directed study of special topics in electronics telecommunications technology. Department chairperson approval is required.

ELEC 299 Special Topics 1-3 credits

Variable instructional topics in the field of electronics/telecommunications technology. Repeatable as long as content varies. Consent of department chairperson.

ELEC 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

ELEC 197-297 Cooperative Education/Internship 1-3 credits

Repeatable up to six semester hours. Students get on-the job experience under qualified supervision in electronics/telecommunications technology occupations. Work hours are arranged by the employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student advisor conferences are held to discuss progress and/or problems. All co-op experiences are graded on a satisfactory/ unsatisfactory basis. Consent of department chairperson.

EMERGENCY MEDICAL TECHNICIAN PARAMEDIC (EMT-P)

SEE PARAMEDIC TECHNOLOGY

ENERGY MANAGEMENT (ENRG)

ENRG 302 Ethical Issues in the Energy Industry 3 credits

Since its inception, the energy industry has faced ethical challenges. From the Edison-Westinghouse feuds to the events leading up to PUHCA in 1935, and from Enron to the failed deregulation attempts in California; there have been numerous instances of ethical dilemmas and governmental response to these issues. This class will look at these issues, what safeguards have been put in place to prevent recurrence, and conclude with several case studies to challenge the students.

ENRG 310 Energy Production and the Environment 3 credits

This class will provide an in-depth look at current environmental issues facing the energy industry as a whole. Included will be a detailed look at the greatest environmental challenge the industry currently faces, climate change.

ENRG 315 Energy Management Communications 3 credits

With the evolution of the smart grid and other advanced technologies across the energy industry more information is readily available on a system wide basis for employees, supervisors and managers. In today's energy field effective communication goes beyond the written and verbal by encompassing the understanding of the specific energy industry nomenclature used in a very technical and hazardous industry. Effectively communicating and precisely managing this information is essential for the energy industry in order to compete in an ever changing global environment. Development, dissemination and compliance of written communication plans are essential in everyday business, interpersonal communications, in crisis situations and in dealing with conflicts in the workplace. Organizational communications, climate, culture and our ethical obligation to society will be discussed in steady state, crisis and hazardous situations. Maintaining environmental compliance and ensuring efficient, reliable and clean energy for the nation are imperative for an industry that will remain under close scrutiny in the foreseeable future.

ENRG 320 Workforce Safety 3 credits

This course presents advanced safety policies and regulations that impact occupational safety and health issues in the workplace. Students will study processes and procedures that protect both the workers and the organizations. Written safety programs, training, workers compensation, the value of safety, and means to build a safety culture in an organization will be studied in the course.

ENRG 330 Government Regulations in the Energy Industry 3 credits

Students will study the legal and regulatory framework in which energy is developed and the business structure of energy producers. Students will learn about the evolution of energy policy in the United States, including the laws and regulations related to particular types of energy sources. Finally, students will study the policy and regulatory structure promoting the development of alternative energy sources and other green initiatives.

ENRG 404 New and Emerging Energy Technologies 3 credits

Students in this course will explore the latest in energy technologies and how they are designed to increase efficiencies, protect the environment and streamline processes. Students will discover how some of the "new technologies" have been around for quite some time and the reasons they are capturing new attention.

ENRG 412 Energy Economics and Finance 3 credits

Students will study the global economics and financial issues that impact the energy industry. They will learn how these impacts affect what strategies energy companies use to secure reliable sources of operating funds and capital investment to improve existing facilities or develop new ones, including but not limited to generating plants, transmission and distribution systems, coal, petroleum, etc. Students will explore how fluctuations in regional, national, and world energy markets directly impact day to day operations.

ENRG 420 Energy Markets and Structures 3 credits

This course provides a comprehensive overview of energy markets, pricing, structures, and economics specifically relating to the energy industry. Students will study the structure of various energy markets and learn to quantify the influence of market structure on energy prices. The course will cover new and emerging markets and teach how modern energy markets are being transformed from regulated monopolies into market-driven suppliers of competitively-priced energy and related services.

ENRG 430 Project Management in the Energy Industry 3 credits

This course introduces the student to project management as it pertains to the energy industry. Students will study the planning, scheduling, and controlling of projects, both large and small, as it pertains to the energy industry. The students will be introduced and study the following subjects:

- The "triangle" of project control consisting of the relationship of scope, duration and costs, and how they interact
- How to read and understand bar charts
- The five stages of a project - initiation, planning, execution, monitoring/control and closure
- Work breakdown structures and how they pertain to project management
- Project organizational structures and staffing
- Project reporting methodologies
- Project estimation (budget vs. forecasts vs. actuals) and cost controls
- Different types of project risks and methods of mitigation

The course will cover these subjects and how they contribute to the success of a project. The course will use theoretical and case studies of actual projects that will be encountered in the energy industry.

ENRG 435 Managing Energy Facilities 3 credits

This course provides a comprehensive overview of facilities management specifically related to the energy industry. Students will study the theories and principles associated with managing large energy production facilities. Major areas analyzed are facilities operations, maintenance, staff management, budgeting, scheduling, managing capital projects, and relationships with contractors and vendors. Students explore current issues related to facilities management and its relationship to various organizational units including human resources, operations, occupational health and safety, labor relations and unions, finance, purchasing and executive management.

ENGINEERING (CAD, CT, EE, ENGR, ME)

AUTOCAD (CAD)

CAD 211 Computer Aided Design I F&S 3 credits

An introduction to computer-aided graphics, with an emphasis on 2-D drawings. Isometric drawings and 3-D models are also introduced. Drafting is done with the aid of microcomputers using AutoCAD computer-aided drafting and modeling software. Prerequisite or corequisite: ENGR 101 or instructor approval.

CAD 212 Computer Aided Design II Spring 3 credits

A continuation of CAD I. Advanced 3-D modeling plus advanced 2-D drawing focusing on civil engineering topics, including structural, civil, and pipe drafting. Prerequisite: CAD 211 or instructor approval.

CAD 213 Computer Aided Design III Fall 3 credits

This course introduces students to the fundamental concepts of civil engineering and surveying 3D software techniques using the AutoCAD Civil3D program. Students learn how to work with point data, how to create and analyze surfaces, how to develop sites, roads, corridors, and pipe networks, how to work with survey data, and how to import and export data. Students will also learn how to create 2D and 3D civil engineering production drawings. Prerequisite: CAD 211 or instructor approval.

CIVIL ENGINEERING AND SURVEYING TECHNOLOGY (CT)

CT 232 Water Management Technology Spring 4 credits

This course covers the fundamentals of water supply and distribution, water treatment processes, sanitary sewage and collection methods, sewage treatment and the environmental effects caused by improper water and sewage handling. Included in the course are topics on hydraulics, chemical and biological testing, water distribution and collection systems and water and sewage treatment facilities. Prerequisite: MATH 105 or MATH 107.

CT 250 Applied Statics and Mechanics of Materials Fall 4 credits

Equilibrium of rigid-bodies and coplanar force systems, trusses, load tracing, centroids and centers of gravity, introduction to stress, strain, shear and bending moments, bending stress, shear stress and beam deflections, properties of materials, simple beam and column design, and connections. Prerequisite: MATH 105 or MATH 107.

CT 251 Materials Testing Spring 3 credits

Introduction to the physical and chemical properties of materials used in civil engineering projects including asphalt, Portland cement, aggregates and soils along with the proper sampling, testing and reporting procedures of these materials. Corequisite: CT 251L. Prerequisite or Corequisite: ENGL 125.

CT 251L Materials Testing Lab Spring 1 credit

Field and office exercises in the sampling and testing of civil engineering materials. Labs are held at the ND Dept. of Transportation Materials and Research Lab. Corequisite: CT 251.

CT 252 Construction Project Management Spring 3 credits

An introduction to inspection procedures, management of quality controls of construction projects, estimating, print reading, and procedures used to administer construction specifications and contracts.

ELECTRICAL ENGINEERING (EE)

EE 206 Circuit Analysis Spring EO 3 credits

Introduction to electric circuit components. Fundamental laws of circuit analysis. Steady state and transient analysis of DC and AC circuits. Electric power calculations. Concurrent registration in EE 206L is required. Prerequisite: ENGR 201.

EE 206L Circuit Analysis Lab Spring EO 1 credit

One hour of lab per week. Concurrent registration in EE 206 is required.

ENGINEERING (ENGR)

ENGR 101 Graphical Communication F&S 3 credits

Elementary space visualization of points, lines, planes, and solids on orthogonal projection; graphical expression of technical sketching; geometry; pictorial representation, and size specification; reproduction methods. Computer-aided drafting is introduced. Prerequisite or Corequisite: Math 105 or 107.

ENGR 201 Statics F&S 3 credits

Vector approach to principles of statics. Resultants of force systems, equilibrium of force systems, analysis of structures, centroids, moments of inertia. Prerequisite or co-requisite: MATH 166.

ENGR 202 Dynamics F&S 3 credits

Vector approach to principles of dynamics. Rectilinear and curvilinear translation, rotation, plane motion, force-mass-inertia, work-energy, impulse-momentum. Prerequisite: ENGR 201.

ENGR 203 Mechanics of Materials Spring 3 credits

Simple stress and strain, torsion, shear and bending moment, flexural and shearing stresses in beams, combined stresses, deflection of beams, statically indeterminate members and columns. Prerequisite: ENGR 201.

ENGR 204 Surveying I Spring 3 credits

Measurements and errors, measurements of distances and angles, differential leveling, traverse surveys, construction surveys, simple horizontal and vertical curves, and earthwork calculations. Prerequisites: MATH 105 or MATH 107 and CAD 211. Corequisite: ENGR 204L.

ENGR 204L Surveying I Lab Spring 1 credit

Three hours of lab per week. Field and office exercises including data collection and computational techniques of surveying data. Corequisite: ENGR 204.

ENGR 205 Surveying II Fall 3 credits

Compound and spiral curves horizontal curves, state plane coordinate system, U.S. public land surveys, boundary surveys an introduction to geodetic surveying, electronic data collection and reduction and GPS surveying. Prerequisite: ENGR 204. Corequisite: ENGR 205L.

ENGR 205L Surveying II Lab Fall 1 credit

Three hours of lab per week. Field and office exercises including data collection, computations and data reduction. Corequisite: ENGR 205.

ENGR 206 Fluid Mechanics BD 3 credits

This course covers fluid properties, fluid statics, fluid dynamics, transport theory and transport analogies, conservation of mass, energy and momentum, dimensional analysis, boundary layer concepts, pipe flows, compressible flow, and open channel flow. Prerequisite: ENGR 201.

ENGR 241 Thermodynamics I Spring 3 credits

Fundamental concepts of thermal energy relationships, processes and cycles are introduced, including: first and second law of thermodynamics, entropy, and availability. Prerequisite: ENGR 201.

ENGR 294 Independent Study 1-3 credits

Independent or directed study of special topics in engineering. Department chairperson approval is required.

ENGR 299 Special Topics in Engineering BD 1-3 credits

Repeatable up to six semester hours. An examination on of special topics in engineering.

ENGR 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

ENGR 197-297 Cooperative Education/Internship F&S SM

1-3 credit hours each

Repeatable up to a maximum of six semester hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

MECHANICAL ENGINEERING (ME)

ME 213 Modeling of Engineering Systems BD 3 credits

Introduction to engineering systems, modeling, and computations; computer methods; analytical methods; verification tasks; case studies. Prerequisite: Calculus 165.

ENGLISH (ASC, ENGL)

ACADEMIC SKILLS COURSES

The following Academic Skills Courses (ASC) are precollege courses that will prepare students for college level work. The credits awarded are not college credits.

ASC 082 Effective Reading F&S SM 2 credits

This course provides strategies to help students increase reading efficiency, comprehension, and vocabulary in order to meet the demands of college level reading. Students will select, read, write, and critically evaluate a variety of written material to improve their reading skills and increase their enjoyment of reading. Students with ACT reading scores of 0-14 or COMPASS reading scores of 0-67 should take this course.

ASC 087 College Writing Preparation F&S SM 3 credits

To succeed in college and beyond, today's students must be able to read, think critically, interpret, react to what they have read, and express their ideas clearly and correctly in written form. This course helps students gain confidence in their writing and thinking skills and bring their writing proficiency up to an acceptable college level. Elements of effective writing are covered to include strategy, organization, style, sentence structure, grammar and usage, and punctuation. Students with ACT English scores of 0-14 or COMPASS 0-42 are required to take this class before taking English 110.

ASC 088 Composition Lab F&S SM 1 credit

Composition Lab is designed as a co-requisite with English 110 for students who demonstrate a need for support instruction in grammar and punctuation based on their placement scores. Students will gain confidence in their editing skills, reduce mechanical errors in their writing, and be able to focus more attention on the craft of thoughtful writing. The course is offered on-campus or online. Students who are required to take ASC 088 must pass the lab in order to pass English 110. Placement is based on the following:

ACT (English)	COMPASS (English)	Course
0-14	0-42	ASC 087 College Writing Prep
15-17	43-67	ENGL 110 +ASC 088 (Composition Lab on-campus or online)
18-36	68-100	ENGL 110 (no Composition Lab required)
ACT 22 or COMPASS 86 required for current high school students taking ENGL 110		

COLLEGE LEVEL COURSES

ENGL 110 College Composition I F&S SM 3 credits

This first course for developing writing skills offers students guided practice in a variety of descriptive-narrative and expository forms, related reviews of grammar and standard usage, and reading and discussion related to these activities. Library research is incorporated into this course. Prerequisite: Students must have ACT English scores of 15 or above or COMPASS English scores of 43 or above or have successfully taken ASC 087. For required composition lab, see the above description of ASC 088.

ENGL 120 College Composition II F&S SM 3 credits

This second course in the composition sequence continues and reinforces the writing skills practiced in English 110, emphasizing library research and the writing of analytical and argumentative papers making use of the thesis-support format and MLA style used in a variety of academic disciplines. Students focus on language through literature and/or film by writing, reading, responding, viewing, and discussing. During spring semester, several sections of English 120 focus on Film as Literature. Prerequisite: Engl. 110.

ENGL 121 Honors Composition II Spring 3 credits

This course is the same as ENGL 120 but limited to people who have special aptitude or interest in reading and writing. In depth discussions of literature will increase students' ability to express a deepening understanding of the world and the people in it through both written and oral communication. Prerequisite: English 110.

ENGL 125 Introduction to Professional Writing F&S SM 3 credits

In English 125, students continue the writing process and research skills practiced in English 110, concentrating on the style, content, and format of business and technical writing. Students analyze and complete a variety of writing projects typical of a professional setting. Prerequisite: English 110.

ENGL 205 English Usage I Fall 2 credits

This first course for developing editing skills offers students guided practice in college level grammar. This study leads to sophisticated understanding of how sentence structure creates meaning. English Usage I is beneficial for a writer in any profession. Suggested co-requisite with journalism courses.

ENGL 206 English Usage II Spring 2 credits

The second course in grammar study continues and reinforces the skills learned in English Usage I. In addition, students will gain a more effective and eloquent writing style by practicing connotation, clarity, specificity, sound, sentence variety and figures of speech. How ideas are coordinated and subordinated is also crucial to this course. Suggested co-requisite with journalism courses.

ENGL 211 Introduction to Creative Writing (Fiction) F&S 3 credits

This course concentrates on the techniques valuable to writers of fiction by providing master literary works to read and respond to. As students practice their own craft, they will reflect on and interpret the human cultural tradition. Students will benefit from both individual and group feedback. Prerequisite: ENGL 110.

ENGL 213 Literary Publications F&S 3 credits

This course will provide the expertise to produce *Figments of Imagination*, the campus literary and arts journal. Students will learn how to solicit manuscript and visual art entries; screen, select and edit pieces; design, layout and publish the literary and arts publication. Literary Publications is a two-semester class. The fall semester focuses on planning, grant writing, establishing a campus and web presence and organizing an open mic night. The spring semester focuses on call for entries, judging and selection of work, design and production of the publication and organizing an open mic night, public reading and collaborative musical performances.

ENGL 221 Introduction to Drama Spring 3 credits

A survey of the world's greatest dramatic literature from Greek times to present. The history of playhouses and stagecraft and other related arts of the theatre are observed in connection with the study of world masterpieces. Prerequisite: English 110 or permission of instructor.

ENGL 222 Introduction to Poetry Spring 3 credits

Students will read, write, and discuss poetry to gain an appreciation and understanding of the elements of poetry. Prerequisite: English 110.

ENGL 233 Fantasy and Science Fiction Fall 3 credits

Study of science fiction and fantasy literature, with an emphasis on those works that have influenced conventional themes within the genre and the manner in which these themes have continued to evolve to incorporate and address contemporary implications and anxieties concerning the impact of science and technology. Prerequisite: ENGL 110.

ENGL 236 Women and Literature Spring 3 credits

This course provides an opportunity for the study of fiction and nonfiction by such well known writers as Kate Chopin, Virginia Woolf, Flannery O'Connor, Zora Neale Hurston, Eudora Welty, Margaret Atwood, and others. Through the readings of short stories, novels, plays, essays, and diaries, students will explore the literary achievements of these and other writers and the social conditions that influenced their lives and works. Authors and selections will vary from semester to semester. Prerequisite: English 110.

ENGL 238 Children's Literature F&S 3 credits

This course is an introductory survey of literature for children from infancy through puberty. Through the readings of picture books, poetry, folklore, fantasy, realistic fiction, biography, and informational books, students will gain an awareness of the history, genre, and theme in children's literature and develop an enjoyment and appreciation of children's literature. In their reading, students will also develop a familiarity with important authors and illustrators as they confront such issues as racism, sexism, multiculturalism, and censorship. Prerequisite: English 110.

ENGL 251 British Literature I Fall 3 credits

Exploring selected works from *Beowulf* through the 18th century, this lecture/discussion course provides students with an introduction to British literature and a background useful in the study of other literature and cultural history. Students will read a variety of works and authors including Chaucer, Marlowe, Donne, Milton, and Swift. Prerequisite: ENGL 110.

ENGL 252 British Literature II Spring 3 credits

Exploring selected works from the Romantic period into the 20th century, this lecture/discussion course provides students with an introduction to British literature and a background useful in the study of other literature and cultural history. Students will read a variety of writers including Blake, Wordsworth, Austen, Keats, Tennyson, the Brontes, Browning, Wilde, and Hardy. Prerequisite: ENGL 110.

ENGL 261 American Literature I Fall 3 credits

This course charts the historical, cultural, and literary evolution of the American nation. Beginning with the verbal and written art of America's first inhabitants, American Indians, the records of European explorers and the writings of colonial settlers, students will explore additional representative works such as slave narratives and the masterful works of writers such as Hawthorne, Melville, Whitman, and Dickinson. Prerequisite: English 110.

ENGL 262 American Literature II Spring 3 credits

Students study representative works of major American writers from the Civil War to the present. Every age in every culture grapples with the essential questions of who we are and what our nature is. The ideas posed by these authors allow learning about history, culture, and life in America. Prerequisite: ENGL 110. ENGL 261 is not a prerequisite for this course.

ENGL 278 Alternative Literature Fall 3 credits

This course will look at literary works such as detective stories, fantasies, science fiction, ethnic and beat literature that have, at times, been judged as lesser works than classical literature. Using a multidisciplinary approach, this course will isolate 20th century works in separate genres and analyze them through the elements they share with "high" literature.

ENGL 279 World Autobiography Spring 3 credits

A survey of world autobiography from the seventh century to the present with emphasis on the diversity of experience, thought, behavior and culture to be found in a global sampling of key works that also succeed as literature.

ENGL 280 Great Books of the Western World Fall 3 credits

A survey of key texts from Homer to Hemingway with emphasis on the diversity of experience, behavior, styles, thought and culture to be found in a sampling of titles selected from Mortimer Adler's *Great Books of the Western World*. Discussions and presentations of texts from other disciplines such as history, philosophy and religion will be considered.

ENGL 294 Independent Study 1-3 credits

Independent or directed study of special topics in English. Department chairperson approval is required.

ENGL 296 Study Tour Spring 3 credits

Students can earn credits by participating in BSC's annual trip to a foreign destination. Students will be required to keep an evaluative journal, read a book that deals with the destination, write a book report, and write another paper that deals with some aspect of the trip.

ENGL 299 Special Topics in English F&S 1-3 credits

Repeatable up to six semester hours. An examination of special topics in English, such as writing fiction and non-fiction, including short stories, plays, journals, letters, reviews, interviews and lyrics. Activities might include writing, group editing, readings in theory, self publication and readers' theatre presentations. Consent of instructor required.

ENGL 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

ENGL 197-297 Cooperative Education/Internship F&S SM 1-3 credit hours each

Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/ unsatisfactory basis. Department chair approval is required.

FIRE TECHNOLOGY (FIRE)

FIRE 101 Fundamentals of Fire Protection F&S 3 credits

Provides an overview to fire protection; career opportunities in fire protection and related fields; philosophy and history of fire protection/ service; fire loss analysis; organization and function of public and private fire protection services; fire departments as part of local government; laws and regulations affecting the fire service; fire service nomenclature; specific fire protection functions; basic fire chemistry and physics; introduction to fire protection systems; and introduction to fire strategy and tactics.

GEOGRAPHIC INFORMATION SYSTEMS (GIS)

GIS 105 Fundamentals of Geographic Information Systems F&S 3 credits

The course provides an introduction to Geographic Information Systems, including how GIS is used for integrating and analyzing spatial data to visualize relationships, seek explanations, and develop solutions to problems. Emphasis is placed on the nature of geographic information, and the ways in which digital methods support geographic analysis. The course is divided between lecture and lab sessions. Introduction to Computers (CSCI 101) or a working knowledge of Microsoft Windows is required.

GIS 107 GIS Applications F&S 3 credits

The course will provide hands-on opportunities to experience the hardware and software used in GIS. The course applies fundamental GIS concepts to creating, editing, and querying spatial data and spatial relationships. Students will manipulate data and make decisions from the presented information through various geoprocessing techniques. Prerequisite: GIS 105.

GIS 201 Advanced GIS Application F&S 3 credits

An advanced hands-on application course designed to extend GIS knowledge and experience and to prepare students in becoming self-sufficient GIS technicians. The course follows a hands-on, problem-solving approach that integrates the interests and analytical needs of participating students. The course will be divided between lecture and lab sessions. Pre-requisites: GIS 105 and 107.

GIS 206 GIS in Science, Agriculture, and Business Fall 3 credits

The course integrates the fields of business, agriculture, and science through GIS and Global Positioning Systems (GPS). The course will be divided between lecture, guest speakers who are experts in their fields, and lab sessions that apply fundamental concepts associated with how GIS can complement business, agricultural, and science applications.

GIS 215 GPS, Photogrammetry, and Remote Sensing Fall 3 credits

The course integrates the disciplines of GPS, photogrammetry, and remote sensing. Hands-on opportunities to manipulate GPS, DOQs, DLGs, TIFFs and JPEG images to track environmental changes over time are presented through raster analysis. Students will work together to solve environmental problems through group projects. Electromagnetic radiation in relation to environmental remote sensing will also be covered.

GIS 225 GIS Project Development and Management Spring 3 credits

GIS 225 focuses on developing GIS project skills. Students will gain experience in the definition, planning, execution, and completion of a geographic information systems project for one of several clients. Students will also exercise technical skills, develop the ability to work in a team environment, and develop negotiating and project management skills. Prerequisite: GIS 105.

GIS 235 Cartographic Design and Analysis Spring 3 credits

The course incorporates the historical foundations of cartographic design and analysis with the digital age (GIS). Topics covered include the rapid changes in cartographic design driven by industry, data classification, advanced map design, generalization, multivariate mapping, and advanced thematic cartography through hands-on applications and case studies. Prerequisite: GIS 105.

GIS 197-297 Cooperative Education / Internship F&S SM 1-3 credits

Students get on-the-job experience under qualified supervision in computer applications, office technology, and network administration occupations. Work hours are arranged by the employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student-advisor conferences are held to discuss progress and/or problems. All co-op/internship experiences are graded on a satisfactory/unsatisfactory basis. Department chairperson approval is required.

GEOGRAPHY (GEOG)

GEOG 121 Physical Geography Spring 3 credits

A survey of the interaction of earth climatic and geologic processes that contribute to the distribution of regional and global environments. Topics include: atmospheric and climate characteristics, crustal movements and processes, the use of selected mapping techniques, and soil and natural vegetation distribution. Concurrent registration in GEOG 121L is required.

GEOG 121L Physical Geography Lab Spring 1 credit

Two hours of lab per week. Laboratory exercises describe the Earth-Sun-Moon system and the determination of time; the principles of meteorology and the classification of climates; agents of erosion and deposition and the geomorphic cycle as it applies in various climates; map projections and the use of topographic maps; groundwater characteristics and karst topography, an others. Concurrent registration in GEOG 121 is required.

GEOLOGY (GEOL)

GEOL 102 Historical Geology BD 3 credits
Three hours of lecture and recitation per week. A study of the deposits laid down during the past geological ages and their fossil contents. Prerequisite: Physical Geology 105 & 105L. Concurrent registration in GEOL 102L is required.

GEOL 102L Historical Geology Lab BD 1 credit
Two hours of lab per week. Laboratory exercises investigate the evolution of the Earth's crust through geologic time. Topics include: plate tectonics, statistical analysis of sediments, strata chronology and the influence of structural forces, relative and radiometric dating, sorting and correlation techniques, geomagnetism, geologic implications in the fossil record, and others. Concurrent registration with GEOL 102 is required. Prerequisite: GEOL 105 & 105L.

GEOL 105 Physical Geology Fall 3 credits
Three hours of lecture and recitation per week. A study of rocks, minerals and the geological processes such as erosion, earthquakes, mountain building and origin of land forms. Concurrent registration in GEOL 105L is required.

GEOL 105L Physical Geology Lab Fall 1 credit
Two hours of lab per week. Laboratory topics include identification of minerals and rocks with emphasis on traditional diagnostic techniques; interpretation of topographic and geologic maps, folding and faulting of the crust; analysis of stream drainage patterns and groundwater resources; location of earthquake foci; and the development of topographic surfaces through the processes of erosion and deposition. Concurrent registration in GEOL 105 is required.

GEOL 294 Independent Study 1-3 credits
Independent or directed study of special topics in geology. Department chairperson approval required.

GEOL 299 Special Topics in Geology BD 1-3 credits
Repeatable up to six semester hours. An examination of special topics in geology.

GRAPHIC DESIGN AND COMMUNICATIONS (GDES)

GDES 103 Introduction to Electronic Imaging Fall 3 credits
A solid foundation in the use of Adobe Photoshop techniques will be covered. Digital photography, scanning, stock photography use and digital manipulation will be covered. Other topics to be discussed are basic composition, photographic illustration, and the relationship of digital photography to the commercial industry. Concurrent registration in or previous successful completion of GDES 103L is required.

GDES 103L Introduction to Electronic Imaging Lab Fall 1 credit
Concurrent registration in or previous successful completion of GDES 103 is required.

GDES 104 Basics of Studio Skills BD 2 credits
Introduction to the use of basic tools and materials used by the commercial artist. Instruction focuses on studio safety, organization and procedures. Concurrent registration in or previous successful completion of GDES 104L is required.

GDES 104L Basic of Studio Skills Lab BD 1 credit
Concurrent registration in or previous successful completion of GDES 104 is required.

GDES 107 Design and Desktop Publishing Fall 3 credits
This course will introduce you to basic graphic design and fluency toward using Macintosh computers and desktop publishing software (Adobe InDesign). The focus of this class will be in using InDesign for commercial use and how it is integrated with other Adobe programs such as Photoshop and Illustrator. You will receive project-based instruction needed to build and design documents and other design assignments related to desktop publishing. Concurrent registration in or previous successful completion of GDES 107L is required.

GDES 107L Design and Desktop Publishing Lab Fall 1 credit
Concurrent registration in or previous successful completion of GDES 107 is required.

GDES 111 Electronic Imaging II Spring 3 credits
Emphasis is on digital camera use starting with the history of cameras and photography. Students will learn how photography is used in the field of graphic design. Camera handling techniques and studio work as it relates to commercial photography will be highlighted. Prerequisite: GDES 103 and 103L, concurrent registration in or previous successful completion of GDES 111L is required.

GDES 111L Electronic Imaging II Lab Spring 1 credit
Concurrent registration in or previous successful completion of GDES 111 is required.

GDES 113 Design and Layout I Spring 3 credits
An introduction to the principles and elements of design and layout as used in advertising, various publications and interactive media. A comprehensive look at the design theories used to successfully communicate in a competitive global market. Emphasis will be placed on working with clients and offering solutions to design problems. Concurrent registration in or previous successful completion of GDES 113L is required.

GDES 113L Design and Layout I Lab Spring 1 credit
Concurrent registration in or previous successful completion of GDES 113 is required.

GDES 115 Typography Spring 3 credit
Prerequisite: Instructor approval. An in-depth study of the art and technique of the printed word – an essential element of virtually all graphic design. An overview of the history of type and the ability to identify and create excellent typography are major outcomes of this course. Creative and technical typographic skills will be discussed and put into practice by means of in-class exercises and homework assignments. Concurrent registration in or previous successful completion of GDES 115L is required.

GDES 115L Typography Lab Spring 1 credit
Concurrent registration in or previous successful completion of GDES 115 is required.

GDES 117 Digital Illustration Fall 3 credits
An introduction to the fundamentals of traditional and computer-generated illustration. Includes a familiarity with illustration style, techniques and software. Development of basic layout and design skills while working on numerous projects on Macintosh computers meant to enhance and broaden a participant's illustration and design skills. Software: Adobe Illustrator. (Additional programs introduced as necessary.) Basic computer skills, keyboarding and printing are vital aspects of the course. Concurrent registration in or previous successful completion of GDES 117L is required.

GDES 117L Digital Illustration Lab Fall 1 credit
Concurrent registration in or previous successful completion of GDES 117 is required.

GDES 201 Current Imaging Fall 3 credits
Prerequisite GDES 111 or instructor approval. Exploration of how images are used in today's graphic design market. Emphasis is placed on digital imaging and how to use advanced techniques to produce professional-grade photo-illustrations. Concurrent registration in or previous successful completion of GDES 201L is required.

GDES 201L Current Imaging Lab Fall 1 credit
Concurrent registration in or previous successful completion of GDES 201 is required.

GDES 202 Current Imaging II Spring 3 credits
Prerequisite: GDES 111 or instructor approval. Emphasis placed on a photojournalistic and commercial approach to photography. Review of photographic fundamentals and continued practice in digital photography. Introduction to equipment, soft goods and techniques that are used in a variety of professional applications. Practice in basic studio lighting techniques and advanced photography. Concurrent registration in or previous successful completion of GDES 202L is required.

GDES 202L Current Imaging II Lab Spring 1 credit
Concurrent registration in or previous successful completion of GDES 202 is required.

GDES 203 Commercial Illustration BD 3 credits
Prerequisite: GDES 111. A study in advanced illustration through the application of sound chronological procedure. Developing the picture idea through research and reference. Additional emphasis placed on composition and color applications. Additional course work will include sketchbook assignments. Concurrent registration in or previous successful completion of GDES 203L is required.

GDES 203L Commercial Illustration Lab BD 1 credit
Concurrent registration in or previous successful completion of GDES 203 is required.

GDES 204 Print Production Spring 3 credits
An in-depth primer on off-set printing for the graphic designer including the pitfalls and solutions for preparing electronic files for various printing methods. Students will learn about putting ink to paper in an electronic age. Some of the subjects to be covered: history of printing, life cycle of a print job, ink, paper, bindery, prepress, preflighting files, managing fonts, vector and raster images, file management, production tips for Adobe Illustrator, Photoshop, InDesign and Acrobat. An intro to packaging design will also be part of this class. Various projects and assignments related to printing will be assigned. Tours of print shops and speakers may be part of this class. Concurrent registration in or previous successful completion of GDES 204L is required.

GDES 204L Print Production Lab Spring 1 credit
Concurrent registration in or previous successful completion of GDES 204 is required.

GDES 207 Introduction to Multimedia Fall 3 credits

Prerequisite: Instructor approval. An in-depth look at the fundamentals of web design and animation. Students will learn how to optimize images for the web as well as create interactive elements such as gif animations and rollovers. Students will also develop a basic working knowledge of vector animation and its role in web design. Software: Photoshop, Dreamweaver, Flash (other programs introduced as necessary).

GDES 207L Introduction to Multimedia Lab Fall 1 credit
Concurrent registration in or previous successful completion of GDES 207 is required.

GDES 209 Design and Layout II Fall 3 credits
Review, demonstrate and build on design skills learned to date. More complex design principles will be explored. This course concentrates on the design and production of portfolio quality projects, specifically selected to demonstrate the capabilities and talents of the design student. Emphasis will be on designing brand experiences. Concurrent registration in or previous successful completion of GDES 209L is required.

GDES 209L Design and Layout II Lab Fall 1 credit
Concurrent registration in or previous successful completion of GDES 209 is required.

GDES 213 Portfolio Presentation Spring 3 credits

Prerequisite: Instructor approval. Portfolio planning and preparation, including selection, organization and professional presentation. Resume development, interview techniques and job application procedures are emphasized to prepare students for the work force. Concurrent registration in or previous successful completion of GDES 213L is required.

GDES 213L Portfolio Presentation Lab Spring 1 credit
Concurrent registration in or previous successful completion of GDES 213 is required.

GDES 294 Independent Study 1-3 credits
Independent or directed study of special topics in graphic design and Communications. Department chairperson approval is required.

GDES 299 Special Topics 1-3 credits
Variable instructional topics in the field of graphic design. Repeatable as long as content varies. Consent of department chairperson.

GDES 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

GDES 197-297 Cooperative Education/Internship 1-3 credits
On a "when available" basis - not required for graduation. Repeatable up to six semester hours. Students get on-the-job experience under qualified supervision in graphic design occupations. Work hours are arranged by the employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student advisor conferences are held to discuss progress and/or problems. All co-op experiences are graded on a satisfactory/unsatisfactory basis. Consent of department chairperson. Must be a full time graphic design student.

HEATING, VENTILATION, AND AIR CONDITIONING (HVAC, REFG, SMTL)

HVAC 100 Introduction to Heating, Ventilation and Air Conditioning Spring 3 credits
This course is an introduction to the heating, ventilation and air conditioning trades and covers safety, tools, test equipment and basic electricity.

HVAC 102 Gas Operations and Safety Procedure Fall 5 credits

This course concentrates on understanding gas operations, gas distribution networks, safety procedures, and complies with the DOT's operator qualification rules.

HVAC 103 Air Conditioning Theory and Components Spring 5 credits

This lecture and discussion course covers the theory of residential cooling. This class will include different types of compressors, evaporators, condensers, metering devices, refrigerants and electrical components.

HVAC 104 Heating Theory and Components Spring 4 credits

This lecture and discussion course covers residential heating systems. This class will include the operation and maintenance of gas, oil and electric furnaces as well as electronic air cleaners and humidifiers.

HVAC 114 Heating Systems Troubleshooting Spring 5 credits

This lecture, discussion, and lab class covers the wiring and troubleshooting of residential gas, oil and electric furnaces through the use of trainers and live equipment.

HVAC 213 Air Conditioning Systems Troubleshooting Summer 5 credits

Prerequisites: Must have successfully completed the spring semester or have departmental approval. This lecture, discussion and lab course covers residential cooling systems. This will include electrical components, wiring, electrical troubleshooting and mechanical troubleshooting using trainers and live equipment.

HVAC 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

HVAC 197-297 Cooperative Education/Internship 1-3 credits repeatable up to 6 semester hours

Students get on-the-job experience under qualified supervision in air conditioning, heating, and refrigeration occupations. Work hours are arranged by the employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student-advisor conferences are held to discuss progress and/or problems. All co-op experiences are graded on a satisfactory/unsatisfactory basis. Consent of department chairperson is required.

HVAC 294 Independent Study 1-3 credits

An independent or directed study of special topics in air conditioning, heating and refrigeration. Department chairperson approval required.

HVAC 299 Special Topics 1-3 credits

Variable instructional topics in the field of air conditioning, heating, and refrigeration. Repeatable as long as content varies. Consent of department chairperson.

REFRIGERATION (REFG)

REFG 215 Light Commercial Refrigeration Summer 2 credits

Prerequisite: Must have successfully completed the spring semester or have departmental approval. This lecture, discussion, and lab course covers some smaller commercial systems, ice machines, system accessories and troubleshooting of this equipment.

REFG 216 Domestic Refrigeration Summer 3 credits

Prerequisites: Must have successfully completed the spring semester or have departmental approval. The operation, components, wiring and troubleshooting of residential refrigerators and freezers are covered in this course. This class consists of lecture, discussion and lab.

SHEET METAL (SMTL)

SMTL 105 Sheet Metal Fall 3 credits

This course is a lecture and drafting class providing an introduction to the sheet metal industry. Covered in this course are tools of the sheet metal industry, trade math I, and parallel line pattern development.

SMTL 106 Sheet Metal II Fall 6 credits

This course is a lecture, drafting and lab class covering trade math II, basic piping practices, sheet metal duct fabrication standards, soldering, insulation, and radial line pattern development.

SMTL 107 Sheet Metal III Fall 4 credits

This discussion, lecture and lab class covers the following aspects of the sheet metal industry: principles of airflow; associated equipment; fiberglass duct; field measuring and fitting and triangulation.

SMTL 115 Practical Applications of Sheet Metal I Fall 4 credits

This lecture and lab course applies theory to actual shop practices including: principles of layout; parallel line pattern development; fasteners, hangers, and supports.

SMTL 118 Technical Aspects of Sheet Metal Retrofit Applications Fall 5 credits

This course is a lecture, drafting, and lab class covering parallel line development and triangulation, focusing on duct fittings needed for replacing old furnaces with new equipment.

HISTORY (HIST)

HIST 101 Western Civilization I F&S 3 credits

European History. A survey of Western Civilization coordinating the study of the factors of economics, politics, society and religion into national strengths. Among the topics covered are: Introductory Historiography, the Origins of Man, Mesopotamian-Egyptian Culture, the Greco-Roman World, the Roots of Christianity, the Medieval Experience, etc.

HIST 102 Western Civilization II Spring 3 credits

European History. A survey of Western Civilization coordinating the study of the factors of economics, politics, society and religion through modern times. Among the topics covered are: the "Rebirth" of the Renaissance, Reformation, Counter-Reformation Conflict, The Commercial Revolution and the New Society, Absolutism and the Sun King, etc.

HIST 103 United States to 1877 Fall 3 credits

A survey of American History—political, social, economic, cultural—from the Colonial Period to the Civil War, with emphasis on the English Colonial Experience, the American Revolution, the establishment of the Union, early reform movements, slavery, and the coming of the Civil War.

HIST 104 United States Since 1877 Spring 3 credits

A survey of American History—political, social, economic, cultural—from the close of the Civil War to the contemporary period, with emphasis on the transformation of the United States into a modern industrial nation, the concerns of progressive America, and the emergence of the United States from economic disaster to become a powerful and prosperous country.

HIST 208 United States: 1932 to Present
BD 3 credits

A survey of historical, political and social dynamics of the United States during the 20th century since 1932, emphasis on domestic changes along with the growing importance of foreign policy.

HIST 220 North Dakota History BD 3 credits

A survey of North Dakota history from the period of early settlement up to the present time with an emphasis on the development and influence of cultural, economic and political factors.

HIST 222 History of the Western Frontier
Spring 3 credits

The Trans-Mississippi West with emphasis on the post Civil-War Frontier. Forces and factors in the settlement and development of the Western Frontier. Among the topics covered are: Western Frontier Historiography, the Fur Trappers, the Spanish-Texan Frontier, Brigham Young and the Mormon Frontier, the Mining Frontier, the Cow-town Frontier, Frontier Violence, Fact and Fancy, the Meaning of the Frontier in American History, etc.

HIST 224-225 American Studies I-II BD 3 credits

Interdepartmental seminar class in the culture of the United States. Subjects vary from year to year and will be topical, such as "American History through Film and Documentaries." Sophomore standing.

HIST 239 The US and the Vietnam War
BD 3 credits

A survey of the impact and consequences of the Vietnam war on the people, politics and social life of the United States.

HIST 243 Historical Investigations BD 1-3 credits

Inquiries into historical phenomena—personages, places, institutions, events, ideas—anything that has to do with the life of man in the past. Repeatable so long as content varies—up to six credit hours. If repeated, consent of instructor or department chair required.

HIST 294 Independent Study 1-3 credits

Independent or directed study of special topics in history. Department chairperson approval is required.

HIST 299 Special Topics in History
BD 1-3 credits

Repeatable up to six semester hours. An examination of special topics in history.

HIST 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

HIST 197-297 Cooperative Education/Internship
F&S SM 1-3 credit hours each

Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

HUMAN AND COMMUNITY EDUCATION (H&CE)

SEE AGRICULTURE

HUMAN SERVICES (HMSV)

HMSV 130 Introduction to Human Services
F&S 3 credits

This course provides an introduction to the helping and non-profit professions, including the various roles, functions, values, and personal attributes needed to function effectively in these careers. Included will be the history, practice setting, career opportunities, and philosophical concepts related to working with vulnerable populations.

HMSV 140 TANF: Temporary Assistance for Needy Families Fall 3 credits

The purpose of this course is to introduce students to the Temporary Assistance of Needy Families Program, examine the laws and policies that drive the program, and develop case management skills in administering the program.

HMSV 141 Supplemental Nutrient Assistance Program
Fall 3 credits

The purpose of this course is to introduce students to the Supplemental Nutrient Assistance Program, examine the laws and policies that drive the program, and develop case management skills in administering the program.

HMSV 142 Medicaid Spring 3 credits

The purpose of this course is to introduce students to the Medicaid Program, examine the laws and policies that drive the program, and develop case management skills in administering the program.

HMSV 143 Child Care Assistance Spring 3 credits

The purpose of this course is to introduce students to the Child Care Assistance Program and to examine the laws and policies that drive the program in North Dakota.

HMSV 201 Introduction to Addictions F&S 3 credits

This course is designed to provide current and researched information about abused substances as well as the people who abuse those substances. Topics include theoretical perspectives on abuse, pharmacological characteristics of commonly abused substances, and stages of dependence and addiction. The following topics relating to various areas of human services will also be covered: working with dually diagnosed clients, chemical abuse by children and adolescents, codependency, and enabling.

HMSV 230 Introduction to Helping Skills F&S 3 credits

This course provides the basic knowledge and skills associated with the helping process, the problem solving process, and interaction skills. Focus will be on the dynamics of the helping relationship, interviewing skills, referral skills, and ethical behavior.

HMSV 197 Human Services Internship
F&S, SM 3 credits

Required for Human Services AAS degree. Students get on-the -job experience under qualified supervision in a human service agency. Work hours are arranged by employer, advisor, and student and a total of 96 contact hours are required for 3 credits. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. Experience is graded on a satisfactory/unsatisfactory basis. Department approval required.

HUMANITIES (HUMS)

HUMS 210 Integrated Cultural Studies 3 credits

Studies into the cultural life of foreign peoples. This course allows students to experience the rich and complex civilization of foreign nations, exploring their geography, history, arts, literature, language, life style and cuisine.

HUMS 211 Integrated Cultural Excursion 1-4 credits

Inquiries into cultural phenomena experienced while traveling. This course allows students, who participate in BSC sponsored tours, to earn college credit while exploring personages, places, institutions or events during their travels. Students will need to make arrangements with the tour coordinator or the chairman of the Humanities department.

HUMS 212 Integrated Cultural Enrichment 2 credits

This course provides cultural enrichment for students by providing them with experiences in the humanities, particularly in the arts, but also in history. Students will participate in the course by attending a minimum of 15 hours of performances, lectures, cultural events, visits to art exhibits and/or museums, and completing supplemental reading.

INSTRUMENTATION AND CONTROL TECHNOLOGY (ICTL)

ICTL 205 Mechanical Practices Fall 4 credits

Prerequisite: Completion of first year Electronics/Telecommunications Technology Program or instructor's approval. This course covers the types of bolts and their ratings, properties of materials, pipe sizes and threads, types of tubing/application, hoses and their fittings, tubing bending, gaskets and O rings. Other topics include instrument installation, compression fittings, introduction to conduit bending and proper use of conduit fittings and flex conduit.

ICTL 205L Mechanical Practices Lab Fall 1 credit

Prerequisite: Completion of first year Electronics/Telecommunications Technology Program. Co-requisite: ICTL 205 or equivalent and instructors approval. The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. This lab is only available on campus.

ICTL 215 Instrument Drawings and Documentation Fall 4 credits

Prerequisite: Completion of first year Electronics/Telecommunications Technology Program or instructor's approval. Topics covers in this course include plant terminology, piping and industrial diagrams (P&ID), electrical and wiring diagrams, graphs, charts, documentation of settings and record keeping, calibration practices and standards, flow, pressure, position, level, temperature and analytical measurements. The use and care of test equipment is also covered.

ICTL 215L Instrument Drawings and Documentation Lab Fall 1 credit

Prerequisite: Completion of first year Electronics/Telecommunications Technology Program. Co-requisite: ICTL 215 or equivalent and instructor's approval. The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. This lab is only available on campus.

ICTL 225 Input and Output Devices Fall 4 credits

Prerequisite: Completion of first year Electronics/Telecommunications Technology Program or instructor's approval. In this course students will study measurement sensors such as proximity sensors and switches, motion detectors, analog and smart transmitters, and temperature devices. Other topics include valves and their types, valve positioners, current to pneumatic (I/P) converters, electric drives and motor starters, dampers and linkages.

ICTL 225L Input and Output Devices Lab Fall 1 credit

Prerequisite: Completion of first year Electronics/Telecommunications Technology Program. Co-requisite: ICTL 225 or equivalent and instructors approval. The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. This lab is only available on campus.

ICTL 235 Motors and Controllers Spring 4 credits

Prerequisite: Completion of the third semester of the I&C program or instructor's approval. Topics of study include types of AC and DC motors, stepper motors, motor theory, and types of motor controls, three phase power, Y and delta configurations, variable speed drives (variable frequency and variable DC), motor and other electrical equipment protection (breakers and overloads).

ICTL 235L Motors and Controllers Lab Spring 1 credit

Prerequisite: Completion of the third semester of the I&C program or instructor's approval. Co-requisite: ICTL 235 or equivalent and instructors approval. The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. This lab is only available on campus.

ICTL 245 Controls Spring 4 credits

Prerequisite: Completion of the third semester of the I&C program or instructor's approval. The student will gain a basic understanding of major components of the following types of controllers: programmable logic controllers (PLC), personal computers (PC), distributive control system (DCS). Programming ladder logic, relay logic, function block control logic, relay logic, digital communications, networking, common and typical controller I/O types will be studied.

ICTL 245L Controls Lab Spring 1 credit

Prerequisite: Completion of the third semester of the I&C program or instructor's approval. Co-requisite: ICTL 245 or equivalent and instructors approval. The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. This lab is only available on campus.

ICTL 255 Automation Overview Spring 4 credits

Prerequisite: Completion of the third semester of the I&C program or instructor's approval. Students will learn to demonstrate a process control loop by building, commissioning, troubleshooting and operating a simulated control loop using interlocking logic and control processor algorithms including proportion, integral and derivative (PID) and loop tuning. Students will participate in tours of different facilities such as power plants, refineries, manufacturing facilities, coal gasification plant and food processing plants.

ICTL 255L Automation Overview Lab Spring 4 credits

Prerequisite: Completion of the third semester of the I&C program or instructor's approval. Co-requisite: ICTL 255 or equivalent and instructors approval. The lab portion of the course is a lab/lecture, which provides hands-on verification of the theory presented in class. This lab is only available on campus.

ELEC 197-297 Cooperative Education/Internship 1-3 credits

Repeatable up to six semester hours. Students get on-the job experience under qualified supervision in electronics/telecommunications technology occupations. Work hours are arranged by the employer, advisor, and

student. Student progress is checked by oral and written reports from the employer. Student advisor conferences are held to discuss progress and/or problems. All co-op experiences are graded on a satisfactory/unsatisfactory basis. Consent of department chairperson.

JOURNALISM (COMM)

COMM 112 Understanding Media and Social Change F&S 3 credits

Students in this course explore the purpose, function and impact of media on society.

COMM 200 Introduction to Media Writing Fall 3 credits

This course is an introduction to writing in the styles and forms required in journalism, broadcast, online media, public relations and advertising. Students gather, organize, and write news stories using Associated Press style and learn about the media process through the applied process of publication.

COMM 201 Interpretive and Opinion Writing F&S 3 credits

Following the tenets of professional journalism organizations and using the work of contemporary columnists and editorial writers as a guide, students will learn the importance of opinion writing. Through discussion and analysis, students will develop their own opinion column as well as write in-depth interpretive stories and editorials. Their writing will be submitted to the editors of the student campus newspaper to be considered for publication.

COMM 233 Media Ethics F&S 3 credits

This course uses real-life and hypothetical cases in ethical decision-making situations in the media areas of general information (truth), advertising, loyalties, public relations, privacy, a democratic society, visuals, cyberspace and arts and entertainment.

COMM 240 Introduction to News Photography F&S 3 credits

Basic principles of the digital photographic process are explored. Major areas covered are equipment selection and handling, light, composition, exposure, and accessories such as filters and proper flash techniques. Good picture taking methods are explained including image transfer, digital file types, and basic Photoshop tools.

COMM 242 Advanced News Photography F&S 3 credits

This course is further exploration of photography in all phases of news and general use. Equipment selection and handling, exposure, and accessories are further explained. Students will be required to shoot assignments for student print and online publications. Prerequisite: COMM 240 or consent of instructor.

COMM 244 Reporting and Feature Writing Spring 3 credits

In this course students discuss current practices, problems and ethics of news reporting. Students are introduced to the differences between hard news and soft news with continued practice in gathering, organizing and writing stories using Associated Press style as well as continued practice in the process of publication. Prerequisite: COMM 200 or consent of instructor.

COMM 270 Basic TV and Video Fall 3 credits

This course teaches the principles of video production. Students learn basic picture and sound generation, recording, editing and scripting and the fundamentals of lighting and equipment setup. Repeatable.

COMM 272 Advanced Video Production Spring 3 credits

This course is designed to help students learn to use video as an effective form of communication. Students will study and apply the technical and aesthetic principles of broadcast production. Emphasis will be on the theory and practice of studio productions and explore electronic news gathering/interview techniques, so students can effectively communicate audio/visual messages through the generally accepted production norms associated with media production. Students will learn to operate equipment in a television studio, work as a member of a production team and serve as a crewmember of the student video production *Mysticast*.

COMM 281 Reporting and Editing F&S 1 credit

Students in this laboratory course become staff members of the student campus newspaper the *Mystician*. Options for involvement include editors, writers, photographers, graphic design artists and advertising personnel. Repeatable.

COMM 282 Yearbook Editing F&S 1 credit

Students in this laboratory course are members of the yearbook staff, who develop, design and create the yearly publication of the *Prairie Mystic*. Repeatable.

COMM 294 Independent Study BD 1-3 credits

Students may opt for independent or directed study of special topics in journalism. This form of study requires approval of the department chair.

COMM 299 Special Topics in Journalism BD 1-3 credits

This course offers an examination of special topics in journalism. Repeatable to six semester hours.

COMM 195-295 Service Learning BD 1-3 credits

Service learning may be accomplished by one of three methods: joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum. Repeatable to six semester hours.

COMM 197-297 Cooperative Education/Internship F&S SM 1-3 credits

Employer, advisor and student arrange work hours. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Approval of the department chair is required. Repeatable to six semester hours.

ENGL 205 English Usage I Fall 2 credits

This first course for developing editing skills offers students guided practice in college level grammar. This study leads to sophisticated understanding of how sentence structure creates meaning. English Usage I is beneficial for a writer in any profession. Suggested co-requisite with journalism courses.

ENGL 206 English Usage II Spring 2 credits

The second course in grammar study continues and reinforces the skills learned in English Usage I. In addition, students will gain a more effective and eloquent writing style by practicing connotation, clarity, specificity, sound, sentence variety and figures of speech. How ideas are coordinated and subordinated is also crucial to this course. Suggested co-requisite with journalism courses.

ENGL 213 Literary Publications Spring 3 credits
This course will provide the expertise to produce *Figments of Imagination*, the campus literary and arts journal. Students will learn how to solicit manuscript and visual art entries; screen, select and edit pieces; design, layout and publish the literary and arts publication. Literary Publications is a two-semester class. The fall semester focuses on planning, grant writing, establishing a campus and web presence and organizing an open mic night. The spring semester focuses on call for entries, judging and selection of work, design and production of the publication and organizing an open mic night, public reading and collaborative musical performances.

LINEWORKER (ELECTRICAL) (LNWK)

LNWK 100 Introduction to Climbing Techniques SM 3 credits
The course is designed for students to learn basic climbing techniques required to be a lineworker.

LNWK 101 Applied Electrical Distribution Fall 5 credits
This is a lab course in which students will learn to climb and work on poles, dig holes, set and frame poles, string, armor rod, tie and sag conductors, and build single-phase circuits.

LNWK 103 Electrical Distribution Fall 4 credits
The course includes the principles to function as a lineworker. Course includes climbing equipment, poles, pole guying, conductors, insulators, proper grounding of equipment, personal protective grounding, and proper use of equipment and tools as well as related safety to accomplish the above.

LNWK 105 Basic Electricity D.C. and A.C. Fall 3 credits
Study of the fundamentals of basic electricity. Subjects include DC and AC theory, Ohm's law and circuit calculations, reactance and power factor, and related math skills.

LNWK 107 Equipment Operations Fall 2 credits
A mix of classroom training and outdoor lab work studying the safe and efficient operation of digger derricks, skid steer loaders, backhoes, and trenchers.

LNWK 111 Safety I Fall 2 credits
Study and practice of accident prevention and job safety.

LNWK 112 Fundamentals of Electrical Distribution Spring 5 credits
This is a lab course in which students will learn to construct multiphase overhead and underground distribution circuits Prerequisite: LNWK 101 and 103.

LNWK 114 Electrical Distribution Spring 4 credits
Prerequisite: LNWK 103 and 101. The course includes the principles to function as a lineworker. Course includes URD cable procedures, distribution transformer installation, work procedures for overhead and underground construction, and related safety to accomplish the above.

LNWK 116 Electrical Apparatus and Transformers Spring 4 credits
Study of the fundamentals of power line apparatus. Subjects include transformer theory and connections, substation and switchyard functions, single circuit meter installation, basic understanding of current and potential transformers when used in metering applications. Also included is the basic understanding of voltage regulators, line fuses, line switches and oil circuit reclosers. Prerequisite: LNWK 105.

LNWK 118 Safety II Spring 2 credits
Safety 1. Continuation of the study and practice of accident prevention and job safety. Prerequisite: LNWK 111.

LNWK 120 Rope and Rigging Spring 2 credits
Students learn and practice knot tying and splicing. Also included are the study of rope characteristics, different uses of rope, and basic rigging techniques.

LNWK 294 Independent Study 1-3 credits
Independent or directed study of special topics in the lineworker field. Department chairperson approval is required.

LNWK 299 Special Topics 1-3 credits
Variable instructional topics in the lineworker field. Repeatable as long as content varies. Consent of department chairperson.

LNWK 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

LNWK 197-297 Cooperative Education/Internship 1-3 credits
Repeatable up to a maximum of six hours. Students get on-the-job experience under qualified supervision in lineworker occupations. Work hours are arranged by the employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student-advisor conferences are held to discuss progress and/ or problems. All co-op experiences are graded on a satisfactory/unsatisfactory basis. Consent of department chairperson.

MASS COMMUNICATIONS - SEE JOURNALISM

MATHEMATICS (MATH)

ASC 092 Beginning Algebra F&S 3 credits
Fundamental skills in mathematics beginning with basic arithmetic and concluding with elementary algebra. Topics designed for those students with little or no mathematics background who wish to prepare for future study in mathematics. Will not satisfy the mathematics/science/ technology requirements at BSC and will not be accepted for credit at transfer institutions.

MATH 102 Intermediate Algebra
Effective Fall 2011, this course is a developmental, pre-college course. Find the course description with Academic Skills Courses on page 143.

MATH 103 College Algebra F&S SM 4 credits
Prerequisite: Qualifying ACT or COMPASS score. Solutions of linear and quadratic equations and inequalities, graphing functions and relations, polynomial and rational functions, systems of equations and inequalities, exponential and logarithmic functions.

MATH 104 Finite Mathematics F&S 3 credits
Prerequisite: Qualifying ACT or COMPASS score. Topics include functions, matrices, modeling, linear systems, linear programming, the simplex method, probability and statistics, and mathematics of finance.

MATH 105 Trigonometry F&S 2 credits
Prerequisites: Math 103. Functions of the general angle, graphs of the trigonometric functions, inverse functions, identities, trigonometric equations, and applications.

MATH 107 Pre-Calculus F&S 5 credits
Prerequisite: Qualifying ACT or COMPASS score. Selected topics from algebra and trigonometry with special emphasis on how they apply to the study of calculus. Topics covered include solutions of equations and inequalities, exponential, logarithmic, trigonometric and circular functions and their graphs.

MATH 137 Applied Algebra F&S SM 3 credits
Prerequisite: ASC 092, or qualifying ACT or COMPASS score. (Refer to the online catalog for updated placement information.) An intermediate algebra course for students enrolled in technology programs. Topics include properties of real numbers, algebraic expressions, factoring, formula manipulation, graphing, linear equations, quadratic equations, solving systems of equations, simultaneous equations, exponents, radicals and logarithmic equations. NOTE: This course satisfies general education requirements for the AAS, diploma and certificate.

MATH 146 Applied Calculus I F&S 3 credits
Prerequisite: Math 103. Limits, continuity, differentiation, integration and differential equations are included with many examples drawn from business, economics, management, life and social sciences.

MATH 165 Calculus I F&S SM 4 credits
Prerequisites: Math 107, MATH 103 and MATH 105 or qualifying ACT or COMPASS score. Review of analytic geometry, limits and continuity, derivatives of functions of one variable with applications, L'Hopital's rule, antidifferentiation, the Fundamental Theorem of Calculus, numerical integration, trigonometric, exponential and logarithmic functions.

MATH 166 Calculus II F&S SM 4 credits
Prerequisites: Math 165. Applications of the definite integral including areas, volumes of solids of revolution, surface areas and centroids; techniques of integration, parametric equations, polar equations, improper integrals, and tests of convergence for sequences and series.

MATH 208 Discrete Mathematics Spring 3 credits
Prerequisite: Math 165. Study of sets, relations, functions, graph theory, Boolean algebra, combinatorics, logic and induction with particular emphasis on their application to computer science.

MATH 210 Elementary Statistics F&S SM 3 credits
Prerequisite: Qualifying ACT or COMPASS score. An introduction to statistical methods of gathering, presenting and analyzing data. Topics include probability and probability distributions, confidence intervals, hypothesis testing, and linear regression and correlation.

MATH 220 Probability and Statistics Spring 3 credits
Prerequisite: MATH 166 or concurrent enrollment in MATH 166. Study of basic probability theory including probability functions for both discrete and continuous data. Sampling distributions, point and interval estimations, hypothesis testing and regression and correlation theory are also explored with emphasis placed on applications of each method.

MATH 227 Applied Linear Algebra Fall 3 credits
Prerequisite: MATH 166 or concurrent enrollment in MATH 166. Vectors and matrices, systems of linear equations and inequalities, mappings, determinants, linear programming and the simplex method.

MATH 265 Calculus III F&S 4 credits
Prerequisites: Math 166. Vectors and the geometry of space, functions of several variables with applications, lines and planes in space, gradient vectors and directional derivatives, multiple integration with applications, divergence and curl, line and surface integrals.

MATH 266 Introduction to Differential Equations Spring 3 credits
Prerequisite: MATH 265 or department approval. Study of first and second order differential equations, linear differential equations, Laplace transforms, systems of equations, approximate solutions by numerical methods, eigenvalues and eigenvectors. Special emphasis is given to applications in a variety of fields.

MATH 277 Mathematics for Elementary Teachers I F&S 4 credits
Prerequisite: Math 103 or consent of instructor. Sets, divisibility, primes, number systems, number bases other than ten, number theory and problem solving. This class is designed specifically for elementary education majors. Three hours of class and one two-hour lab per week.

MATH 294 Independent Study 1-3 credits
Independent or directed study of special topics in mathematics. Department chairperson approval is required.

MATH 299 Special Topics in Mathematics BD 1-3 credits
Repeatable up to six semester hours. An examination of special topics in mathematics.

MATH 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

MATH 197-297 Cooperative Education/Internship F&S SM 1-3 credit hours each
Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

MECHANICAL ENGINEERING (ME)

SEE ENGINEERING

MECHANICAL MAINTENANCE TECHNOLOGY (MMAT) (WELD)

MMAT 101 Introduction to Industrial Operations F&S 1 credit
Covers the basic steam generation and gas conversion systems, how thermal energy is converted into electrical energy, components of the system, and design features for gaining thermal efficiency. Includes handling of water, fuel, and wastes, and the operating features of a industrial plant.

MMAT 103 Safety and Health F&S 3 credits
This course covers all aspects of maintaining a safe work environment; Including OSHA/Regulatory Compliance and Laboratory Safety. This course meets the needs of industrial safety, health, and regulatory training.

MMAT 105 Hand and Portable Tools F&S 2 credits

This course covers the most important hand tools used on the job. Examines the various kinds of wrenches and screwdrivers, their uses and handling techniques, pipefitting tools, plumbing tools, electrician's tools, sheet metalworking tools, machinists' metal-working tools. Explains the uses, selection, safety, and care of industrial power tools: electric drills, electric hammers, pneumatic drills and hammers, screwdrivers, nut runners, wrenches, linear-motion and circular saws, routers and planes, electric sanders, grinders, and shears. Covers tool sharpening techniques for selected tools.

MMAT 107 Basic Mechanics F&S 2 credits

This course covers force and motion, work and energy and fluid mechanics as applied in industrial maintenance. Explains principles of operation for simple machines, such as the lever, inclined plane, wheel and axle, pulley, and screw. Explains the basic elements of industrial machines, as well as common measurement tools used to monitor and adjust equipment.

MMAT 109 Measurements F&S 2 credits

This course covers units of measurement used in commercial and industrial applications. Examines all aspects of basic measurement concepts and procedures, including accuracy and tolerance .Covers techniques and devices for comparison measurements (dial indicators and gauge blocks).

MMAT 111 Schematics Symbols and Blueprints F&S 2 credits

Covers all types of schematics and symbols used in commercial and industrial settings. Examines symbols on schematics, electrical symbols and diagrams, piping symbols and diagrams, hydraulic and pneumatic diagrams and symbols. Studies air conditioning and refrigeration systems, including explanations of electrical/electronic control schematics. Covers welding and joining symbols.

MMAT 113 Industrial Rigging F&S 1 credit

This course covers techniques and safeguards in the use of rope, chain, hoists, and scaffolding when moving heavy plant equipment and maintaining plant utilities.

MMAT 115 Lubrication, Bearings and Seals F&S 2 credits

Covers a complete lubrication training program, including functions and characteristics of lubricants, factors in selection of lubricants, and effects of additives. Oils, greases, and other compounds used for lubrication are described, as well as their applications. Covers plain bearings, their parts, dimensions, functions, and relining techniques. Continues with installation and replacement of anti-friction bearings. Also covers linear motion bearings and shaft seals.

MMAT 117 Material Handling Systems F&S 1 credit

Covers belt conveyors that carry coal, sand, gravel, grain and other loose materials. Acquaints the student with the terminology, basic structure, and operation of material handling systems. Includes detailed coverage of belts, belt cleaners, idlers, and feed/discharge devices, as well as an explanation of how to install, maintain, replace, and troubleshoot these components.

MMAT 119 Troubleshooting Skills F&S 1 credit

Explores the subject of troubleshooting and the importance of proper maintenance procedures. Covers working with others, aids in communication, and trade responsibilities. Outlines troubleshooting techniques and aids, using schematics and symbols. Focuses on specific maintenance tasks, breakdown maintenance, and planned maintenance.

MMAT 150 Mechanical and Fluid Drive Systems 2 credits

Covers belt drives, chain drives, gears and gear drives, adjustable-speed drives, shaft alignment, shaft coupling devices, and clutches and brakes.

MMAT 155 Hydraulics and Pneumatics 2 credits

Covers hydraulic and pneumatic principles, types of hydraulic fluids and their characteristics. Describes components of hydraulic and pneumatic systems and their functions, including filters and strainers, reservoirs and accumulators, pumps, piping, tubing and hoses, control valves, relief valves, and actuating devices.

MMAT 160 Valves and Steam Traps 3 credits

Covers maintenance and operation of gate, globe, ball, plug, check, special-purpose valves and steam traps. Details actuators and various accessories. Explains valve selection based on application. Explores methods of protecting piping systems.

MMAT 165 Piping and Tubing Systems 3 credits

Covers tubing specifications, materials, and fittings. Explores procedures used for handling, bending, cutting, and installing tubing. Gives basics of tubing in a hydraulic system. Covers hose systems and their functions. Concludes with gaskets, sealants, and adhesives.

MMAT 170 Equipment Installation 3 credits

Covers installation procedures for large plant equipment. Considers factors affecting proper installation in detail from preparatory relocation of underground piping and wiring through equipment anchoring, aligning, and test running.

MMAT 175 Pumps, Compressors, and Turbines 4 credits

Covers typical applications of various types of pumps, compressors and turbines. Explores factors affecting equipment selection. Defines operating principles of centrifugal, propeller, and turbine, rotary, reciprocating, and metering equipment. Includes special-purpose pumps, diaphragm pumps, and others designed to handle corrosive and abrasive substances.

MMAT 200 Maintenance Pipefitting 1 credit

Covers piping and tubing systems used for fluid transport in the plant: hydraulic fluids, steam, liquefied product, refrigerant, and water. Explores typical metallic and nonmetallic piping systems, pipe-joining methods, and how tubing and hoses differ from piping. Covers valves, pipe fittings, hangers, supports, and insulation, and covers how tubing is sized, fitted, bent, and joined. Studies uses of traps, filters, and strainers.

MMAT 205 Basic Electricity and Electronics 2 credits

Covers basic, nonmathematical approach to understanding principles of electricity. Introduces electron theory, static electricity, electrons in motion, and magnetism. Covers basic methods of measuring current, voltage, and resistance. Explains circuit components-conductors, insulators, resistors, capacitors-and simple Ohm's Law calculations for DC and AC circuits.

MMAT 210 Metals in the Plant 2 credits

Introduces metals, metallurgy, and metalworking. Covers the properties of metals, including their mechanical properties. Examines several industrial manufacturing processes. Covers iron and standard steels. Studies the different kinds of heat treatment and their usage. Introduces techniques of working with copper, aluminum, magnesium, titanium, lead, nickel, tin, and zinc.

MMAT 215 Nonmetals in the Plant 2 credits

Introduces major nonmetal materials and how they are most frequently used. Illustrates properties, characteristics, and classifications of each material. Covers synthetic and natural materials. Examines various paints and coatings, their proper use, preparation, and application. Surveys industrial chemicals. Chemical safety precautions are covered, along with the proper use of protective equipment.

WELD 110 Oxyfuel Operations 2 credits

Introduces welding of ferrous and nonferrous metals. Covers oxygen cutting as well as brazing and soldering. Explores surfacing techniques.

WELD 118 Testing OA in Welding, Brazing, Cutting F&S 2 credits

This course provides the lab to develop the manual skills necessary to produce high quality welding using the oxyacetylene welding, brazing, and cutting processes on mild steel.

WELD 135 Welding Principles 2 credits

Introduces metals, metallurgy, and metalworking. Discusses the properties of metals, including their mechanical properties. Examines several industrial manufacturing processes. Covers iron and standard steels. Defines the different kinds of heat treatment and their usage. Covers some techniques of working with copper, aluminum, magnesium, titanium, lead, nickel, tin, and zinc.

WELD 140 Methods in GMA & FCA Welding F&S 2 credits

This course provides the lab to develop the manual skills necessary to produce high quality welds on mild steel plate using the gas metal and flux cored arc welding process in all positions.

WELD 170 Arc Welding Operations 2 credits

Covers shielded metal arc welding, selecting electrodes for SMAW, gas metal and tungsten arc welding, preheating, reheating, welding ferrous and nonferrous metals, pipe welding, hard facing, and rebuilding.

WELD 180 Shielded Metal Arc Welding Spring 2 credits

This course provides the training to develop the manual skills necessary to produce high quality welds using the shielded metal arc welding process on thin and medium thickness mild steel plates in all positions using the E70 series electrodes.

MMAT 197-297 Cooperative Education/Internship 1-3 credits

Repeatable up to six semester hours. Students get on-the-job experience under qualified supervision in mechanical maintenance technical occupations. Work hours arranged by employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student-advisor conferences are held to discuss progress and/or problems. All co-op experiences are graded on a satisfactory/unsatisfactory basis. Consent of department chairperson.

MEDICAL LABORATORY SCIENCES (MLS)

MLS 100 Human Structure and Function F&S 4 credits

Includes lecture and laboratory. Designed for students enrolled in the Medical Laboratory Technician and Phlebotomy Technician programs. Does not fulfill the requirements for nursing, surgical technician, massage therapy. Not GERTA approved. Fundamental concepts of the structure and function of the cells, tissues, organs and organ systems of the human body. Special emphasis is placed on those systems most closely related to diagnostic procedures performed in the clinical laboratory, including the following: skeletal, muscular, nervous, cardiovascular, lymphatic, immune, endocrine, digestive, respiratory and renal. Open to all students.

MLS 101 Introduction to Medical Laboratory Science Fall 1 credit

An introduction to the medical laboratory and the profession of medical laboratory science. Professional ethics, medical terminology, laboratory safety, the use and care of basic laboratory equipment. Open to all students.

MLS 103 Phlebotomy F&S EO 3 credits

Phlebotomy is the "art of drawing blood." The course consists of a knowledge component to include: anatomy of hand, arm, foot and blood vessels; blood composition, specimen types, and coagulation factors. The motor skills component will include instruction in manual phlebotomy techniques, and drawing and handling specimens. The attitude component discusses the public relations aspect of the job and job applications. Open to all students.

MLS 104 Phlebotomy Internship F&S, SM 8 credits

The internship provides a supervised rotation of no less than 160 hours in the phlebotomy section of the affiliated clinical laboratory. Prerequisites: acceptance into the Phlebotomy Technician program, MLS 103, ENGL 110, CSCI 101, MLS 100, BOTE 171.

MLS 113 Urinalysis Fall 1 credit

Review of renal anatomy and physiology; urinalysis theory and techniques, with emphasis on microscopic analysis of urine sediment. Includes lab. Prerequisites: Acceptance into MLT program. Corequisite: MLS 101.

MLS 115 Clinical Parasitology Fall 1 credit

Study of parasites and their relationship to the human host. Includes lab. Prerequisite: Acceptance into MLT program. MLS 101.

MLS 201 Immunology Spring EO 4 credits

The foundations of diagnostic serology, immunohematology, histocompatibility and hematology as well as new technology such as monoclonal antibodies and molecular biology are covered in order for students to become better prepared for a career in laboratory medicine. Prerequisites: General Biology 150-151 or equivalent, CHEM 115,116 or 121,122 strongly recommended. Open to all students.

MLS 205 Clinical Internship I SM 1 credit

Supervised rotations in the phlebotomy and clinical microscopy departments of the clinical affiliate laboratory. Prerequisites: MLS 101, 103, 113, 115, 201 225. Corequisites: MLS 235, 245.

MLS 215 Clinical Internship II SM 2 credits

Supervised experience in the hematology, chemistry, microbiology and blood banking departments of the affiliated clinical laboratory. Prerequisites: MLS 205.

MLS 225 Hematology Spring 3 credits

Identification of normal and abnormal blood cells in various hematological disorders. Theory and applications of hematology procedures. Morphologic examination of blood and marrow and routine manual hematologic procedures. Prerequisite: MLS 101.

MLS 235 Clinical Chemistry I SM 3 credits
Principles of instrumentation and the theory and application of the biochemical tests performed in the clinical laboratory. The student will receive instruction in the basic techniques required for performing routine manual determinations. Prerequisite: MLS 101, 113, CHEM 115,116, 115L, 116L. BIOL 220, 221, 220L, 221L or MLS 100. Corequisite: MLS 205.

MLS 236 Clinical Chemistry II Fall 1 credit
Continuation of the lectures given during the summer session. Prerequisite: MLS 235.

MLS 240 Immunohematology Fall 3 credits
Lecture and laboratory. Fundamental principles of immunology are presented and applied to serology and blood banking. Donor selection, blood collection and processing, blood components and compatibility testing. Preparation and administration of blood and genetics of blood inheritance. Theory of blood coagulation and procedures. Prerequisites: MLS 101, 201, 225.

MLS 245 Clinical Microbiology I SM 3 credits
The morphology, culture characteristics and identification of bacteria pathogenic to man and their role in infectious disease are discussed, as well as antibiotics susceptibility testing and rapid identification systems. Prerequisite: MICR 202, MLS 101, 115, 225. Corequisite: MLS 205.

MLS 246 Clinical Microbiology II Fall 1 credit
Continuation of the lectures given during the summer session and Mycology. Prerequisites: MLS 245.

MLS 255 Clinical Internship III BD 12 credits
Supervised experience in the hematology, chemistry, microbiology, and blood banking departments of the affiliated clinical laboratory. Prerequisites: All MLS courses.

MLS 294 Independent Study 1-3 credits
Independent or directed study of special topics in medical laboratory. Department chairperson approval is required.

MLS 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

MLS 197-297 Cooperative Education/Internship F&S SM 1-3 credit hours each
Repeatable up to a maximum of six semester hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

MLS 299 Special Topics in Medical Laboratory Science BD 1-3 credits
Repeatable up to six semester hours. An examination of special topics in medical laboratory technology.

MICROBIOLOGY (MICR)
SEE BIOLOGY

MILITARY SCIENCE (MS)

MS 101 Military Science I Fall 2 credits
MS 101 introduces the student to the personal challenges and competencies that are critical for effective leadership. The student will learn how the personal development of life skills such as goal setting, time management, physical fitness, and stress management relate to leadership, officership, and the Army profession. The focus is on developing basic knowledge and comprehension of Army leadership dimensions, attributes and core leader competencies while gaining a big picture understanding of the ROTC program its purpose in the Army, and its advantages for the student.

MS 101L Leadership Lab Fall 1 credit
MS 101L provides students with the opportunity to apply the knowledge, tools and techniques they learn in MS 101.

MS 102 Military Science I Spring 2 credits
MS 102 overviews leadership fundamentals such as setting direction, problem-solving, listening, presenting briefs, providing feedback and using effective writing skills. Students will explore dimensions of leadership attributes and core leader competencies in the context of practical, hands-on, and interactive exercises.

MS 102L Leadership Lab Spring 1 credit
MS 102L provides students with the opportunity to apply the knowledge, tools and techniques they learn in MS 102.

MS 201 Military Science II Fall 2 credits
MS 201 explores the dimensions of creative and tactical leadership strategies and styles by examining team dynamics and two historical leadership theories that form the basis of the Army leadership framework. Aspects of personal motivation and team building are practiced by planning, executing and assessing team exercises. The focus continues to build on developing knowledge of the leadership attributes and core leader competencies through the understanding of Army rank, structure, and duties as well as broadening knowledge of land navigation and squad tactics. Case studies will provide a tangible context for learning the Soldier's Creed and Warrior Ethos as they apply in the contemporary operating environment.

MS 201L Leadership Lab Fall 1 credit
MS 201L provides students with the opportunity to apply the knowledge, tools and techniques they learn in MS 201.

MS 202 Military Science II Spring 2 credits
MS 202 examines the challenges of leading tactical teams in the complex contemporary operating environment (COE). This course highlights dimensions of terrain analysis, patrolling, and operation orders. Further study of the theoretical basis of the Army Leadership Requirements Model explores the dynamics of adaptive leadership in the context of military operations. This course is designed to provide a smooth transition into the ROTC upper division courses offered at the university level. Students develop greater self awareness as they assess their own leadership styles and practice communication and team-building skills. COE case studies give insight into the importance and practice of teamwork and tactics in real-world scenarios.

MS 202L Leadership Lab Spring 1 credit
MS 202L provides students with the opportunity to apply the knowledge, tools and techniques they learn in MS 202.

MILITARY SCIENCE (MS)

MS 101 Military Science I 2 credits
MS 101 introduces the student to the personal challenges and competencies that are critical for effective leadership. The student will learn how the personal development of life skills such as goal setting, time management, physical fitness, and stress management relate to leadership, officership, and the Army profession. The focus is on developing basic knowledge and comprehension of Army leadership dimensions, attributes and core leader competencies while gaining a big picture understanding of the ROTC program, its purpose in the Army, and its advantages for the student.

MS 101L Leadership Lab 1 credit
MS 101L provides students with the opportunity to apply the knowledge, tools and techniques they learn in MS 101.

MS 102 Military Science I 2 credits
MS 102 overviews leadership fundamentals such as setting direction, problem-solving, listening, presenting briefs, providing feedback and using effective writing skills. Students will explore dimensions of leadership attributes and core leaders competencies in the context of practical, hands-on, and interactive exercises.

MS 102L Leadership Lab 1 credit
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MS 201L Leadership Lab 1 credit
MS 201L provides students with the opportunity to apply the knowledge, tools and techniques they learn in MS 201.

MS 202 Military Science II 2 credits
MS 202 examines the challenges of leading tactical teams in the complex contemporary operating environment (COE). This course highlights dimensions of terrain analysis, patrolling, and operation orders. Further study of the theoretical basis of the Army Leadership Requirements Model explores the dynamics of adaptive leadership in the context of military operations. This course is designed to provide a smooth transition into the ROTC upper division courses offered at the university level. Students develop greater self-awareness as they assess their own leadership styles and practice communication and team-building skills. COE case studies give insight into the importance and practice of team work and tactics in real-world scenarios.

MS 202L Leadership Lab 1 credit
MS 202L provides students with the opportunity to apply the knowledge, tools and techniques they learn in MS 202.

MUSIC (MUSC)

MUSC 100 Music Appreciation F&S 3 credits
Covers musical styles and forms of classical music as well as historical background from the Medieval to the Contemporary. A study of periods, composers, and compositions. A background in music is not required. No prerequisites.

MUSC 117 Concert Choir F&S 1 credit
Performing ensemble open to all BSC students. Activities include Choir Fest, tours and concerts on campus. Students in their first semester of choir at BSC also enroll in Applied Music 145 or Class Voice.

MUSC 118 Chamber Choir F&S 1 credit
An auditioned select ensemble of 12-16 voices. Music covers a variety of styles from madrigal to classical, jazz to popular. Concurrent registration in Concert Choir required. Students in their first year of choir at BSC also enroll in Applied Music 145 or Class Voice.

MUSC 121 String Ensemble F&S 1 credit
Open to all BSC students with a background in stringed instruments.

MUSC 122 Music Theory I Fall 3 credits
Notation, rhythm, scales, intervals, transposition, harmony, cadences and nonharmonic tones. Concurrent registration in Music 123 and Music 151 or Applied Piano (MUSC 145) required for majors or students interested in continuing with Music Theory II.

MUSC 123 Aural Skills I Fall 2 credits
Emphasis on developing vocal production, aural/reading skills in scales, intervals and rhythms, and basic melodic and rhythmic dictation.

MUSC 124 Music Theory II Spring 3 credits
Prerequisite: Music 122. Partwriting, seventh chords, secondary dominants, modulation, composition. Concurrent registration in Music 125 and Music 152 or Applied Piano (MUSC 145) required.

MUSC 125 Aural Skills II Spring 2 credits
Continuation of Music 123. Prerequisite: Music 123.

MUSC 130-131, 230-231 Class Voice F&S 1 credit
Music 130-131 is for men and Music 230-231 is for women. Students concentrate on a group approach to singing technique and solo singing of literature for male voices and female voices.

MUSC 132 Wind Ensemble (Band) F&S 1 credit
A performing ensemble for those students who enjoy expression through instrumental playing. Open to all BSC students.

MUSC 133/134 Woodwind Ensemble I&II F&S 1 credit
Open to all students, these groups perform chamber music for community functions as well as campus recitals.

MUSC 135/136 Brass Ensemble I&II F&S 1 credit
Open to all students, these groups perform chamber music for community functions as well as campus recitals. Concurrent registration in Wind Ensemble required.

MUSC 137 Jazz Ensemble F&S 1 credit
Open to all students. Jazz literature from all 20th century styles, improvisation, concerts throughout the year.

MUSC 138 Percussion Ensemble F&S 1 credit
Open to percussionists and non-percussionists by audition, this group performs a variety of percussion/mallet music for community events and campus recitals.

MUSC 140 Orchestra F&S 1 credit
The Bismarck-Mandan Symphony Orchestra offers dual credit to interested students in pursuing performance opportunities in orchestral literature. Students will rehearse according to the Bismarck-Mandan Symphony Orchestra schedule and at their rehearsal locations as published by the symphony office. The Bismarck-Mandan Symphony Orchestra is a community organization open to qualified students upon audition and approval of the director, Dr. Beverly Everett. Repeatable for credit.

MUSC 145 Applied Music F&S 1 credit
For students not enrolled as music majors. Private lessons in voice, piano, strings, wind instruments, percussion, organ, guitar; the name of the instrument becomes the name of the course. Open to all BSC students. Lessons are half hour weekly for ten weeks. Lab fee.

MUSC 146 Applied Music-Major F&S 1 credit
For students declared as music majors. Private lessons in voice, piano, strings, wind instruments, percussion, or guitar for music majors, music minors or other students with approval of instructor. Lessons are one hour weekly for ten weeks. Lab fee.

MUSC 151-152/251-252 Class Piano I-IV 1 credit
Study of the basic elements of piano proficiency including intervals, scales, chords, transposition and harmonization of melodies. Begins with elementary piano skills and advances to intermediate piano skills. Students interested in starting above Level 1 need permission of instructor.

MUSC 153 Class Guitar-Beginner 1 credit
Group instruction for students with no prior experience on guitar. Emphasis on chord and fretboard knowledge, music reading skills and learning popular songs. A steel or nylon string guitar is required.

MUSC 154 Class Guitar II 1 credit
A continuation of material studied in Class Guitar I. Class Guitar II focuses on the study of chords, scales, reading music, and music of contemporary guitar styles. Prerequisite: MUSC 153 or instructor's approval.

MUSC 155 Guitar Ensemble 1 credit
Guitar Ensemble is a select performance group that showcases the guitar in an ensemble setting. Students need to know how to read music, chord charts and tablature. Classical, jazz, and rock literature will be studied. Students are required to be in Applied Music-Guitar (MUSC 145 or 146).

MUSC 160 Mini-Music BD 1 credit
Selected music topics offered upon demand in five-week segments in the evening division.

MUSC 207 Music for Teachers Fall 3 credits
A survey of elementary school music. Development of teaching skills and knowledge, including use of autoharp, tonette, and rhythm instruments.

MUSC 222 Music Theory III Fall 3 credits
Chromatic harmony, study of musical forms, composition, and musical analysis. Concurrent registration in Music 223 and 251 or Applied Piano (MUSC 145) required. Prerequisite: Music 124.

MUSC 223 Aural Skills III Fall 2 credits
Emphasis on continued development of aural skills in interval and chord identification, rhythmic and melodic dictation, error detection and sight singing. Prerequisite: Music 125.

MUSC 224 Music Theory IV Spring 3 credits
Counterpoint and Twentieth Century music, including Impressionism, Neoclassicism and Serialism. Concurrent registration in Music 225 and 252 or Applied Piano (MUSC 145) required. Prerequisite: Music 222.

MUSC 225 Aural Skills IV Spring 2 credits
A continuation of Music 223. Prerequisite: Music 223.

MUSC 240 Brass Methods BD 2 credits
Covers literature, instruction of and performance on brass instruments. Required for music majors. Offered by demand.

MUSC 241 Percussion Methods BD 2 credits
Covers literature, instruction of and performance on percussion instruments. Required for music majors. Offered by demand.

MUSC 243 Woodwind Methods BD 2 credits
Covers literature, instruction of and performance on flute and clarinet. Required for music majors. Offered by demand.

MUSC 244 Woodwind Methods BD 2 credits
Covers literature, instruction of and performance on saxophone and double reed instruments. Required for music majors. Offered by demand.

MUSC 249 Vocal Methods Spring 1 credit
Covers basic vocal pedagogy including the International Phonetic Alphabet, English diction, and an organized approach to correct vocal development and production. Required for music majors. Offered alternate years.

MUSC 250 Vocal Methods Fall 1 credit
Continuation of Music 249 with emphasis on Italian and German diction and techniques for vocal instruction. Required for music majors. Offered alternate years.

MUSC 260 Sophomore Project F&S 1 credit
Preparation and presentation of a sophomore recital.

MUSC 261 Basic Conducting-Choral Fall 2 credits
Conducting patterns, observation of conductors, terminology, discussion of the role of the conductor, and practical conducting experience. Students must be enrolled in Concert Choir or currently directing a school, church or community choir. Offered alternate years.

MUSC 262 Basic Conducting-Instrumental Spring 2 credits
Score reading, basic conducting techniques, rehearsal problems, along with practical conducting experience. Offered alternate years.

MUSC 294 Independent Study 1-3 credits
Independent or directed study of special topics in music. Department chairperson approval required.

MUSC 299 Special Topics in Music BD 1-3 credits
An examination of special topics in music such as composition or computer notation. Repeatable up to six semester hours.

MUSC 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

MUSC 197-297 Cooperative Education/Internship F&S SM 1-3 credits each

Students develop a program according to their individual interests in areas such as recording technology and instrument repair. Repeatable up to a maximum of six hours. All co-op experiences graded on satisfactory/ unsatisfactory basis. Department chair approval is required.

NUCLEAR POWER TECHNOLOGY (NUPT)

NUPT 101 Overview of Nuclear Energy 2 credits

In this course the student will study the history of nuclear power, the basic principles of reactor design and operation at commercial nuclear electrical generating facilities. It includes an examination of nuclear waste issues, a study of important events which occurred at commercial nuclear plants, and a look towards the future of the electrical generating industry.

NUPT 103 Nuclear Mathematical Fundamentals 3 credits

This course will review basic math, including basic arithmetic functions, fractions and decimals. The course will continue by covering scientific notation, dimensional analysis, algebra, basic geometry and trigonometry. Control charts and graphs, logarithms and exponential functions, and rate concepts will also be covered.

NUPT 105 Classical Physics 4 credits

Recommended prerequisite NUPT 103. This course is designed to introduce students to classical physics. Topics covered include: units of measurement, kinetics, force, energy, momentum, work, fluids, and mechanical principles.

NUPT 107 Engineering Drawings, Diagrams, and Schematics 3 credits

This course will introduce students to engineering drawings, diagrams, and schematics that are used in nuclear operations. Students will learn how to read and decipher the various nuclear symbols, components, systems, and legends found on diagrams, drawings, and schematics.

NUPT 109 Electrical Science 4 credits

Recommended prerequisite NUPT 103. This course begins with the study of basic electrical fundamentals, theory, laws, and magnetism. Direct current and alternating current electrical circuits, generators, motors, and other components along with their applications will be covered. Single-phase AC circuits and three-phase AC circuits will be discussed. Inductance, capacitance, impedance, and resonance will be covered along with construction of conductors, insulators, and relays.

NUPT 111 Instrumentation and Control 4 credits

Recommended prerequisites NUPT 109 and NUPT 217. This course will cover the construction, operation, and failure modes of basic sensors and detectors used in nuclear generation. Included in this are gamma and neutron core power detector construction, operation and effects. Various control systems will be covered including failure symptoms and troubleshooting techniques from an operational perspective.

NUPT 113 Mechanical Science Spring 3 credits

This course will cover the basic function, design, and operation of mechanical components and equipment which are an integral part of nuclear facilities. Pumps, heat exchangers, valves, diesel engines, compressors, and filters will be included as well as some mechanical systems such as cooling towers and refrigeration.

NUPT 213 Nuclear Physics 3 credits

Recommended prerequisite NUPT 105. This course will tour the topics that comprise the fundamentals of nuclear science, giving the students an appreciation of theory and principles that govern nuclear processes involved in an operating reactor. This course covers the fundamental atomic structures, nuclear nomenclature, binding energy and nuclear decay reactions. Other topics such as the famous E=mc2 equation, neutron interaction with matter, the fission process and decay heat will be related to the everyday operation of a nuclear power plant.

NUPT 215 Nuclear Plant Chemistry 3 credits

Recommended prerequisite NUPT 103. This course covers basic chemistry fundamentals relating to maintaining water purity in primary and secondary systems. This course also covers chemistry concepts for both pressurized water reactors and boiling water reactors. Principles of water treatment, hazards and safety requirements will also be contained in the course.

NUPT 217 Heat Transfer, Fluid Flow & Thermodynamics 4 credits

Recommended prerequisite NUPT 105. This course covers heat transfer, fluid flow fundamentals, and the basics of thermodynamics. It begins with a discussion of temperature and heat, and progresses into heat capacities, sensible and latent heats. The laws of thermodynamics and related terms are introduced. The student will learn to perform energy balances, and understand thermodynamic processes and cycles. Properties of fluids and descriptions of their behavior are discussed. Topics covered include density, static head, hydraulics, buoyancy, and fluid flow. Centrifugal pumps are studied as well as closed system operation.

NUPT 219 Material Science 3 credits

This course provides the student with a basic understanding of the structure of metals and how those structures are affected by various processes. The properties of metals and their applications are also covered along with thermal stress and shock. Ductile and brittle fractures will also be covered along with selecting materials for specific use in the industry. Lastly, students will discuss how important pressure and temperature curves are and why they are used when heating up and cooling down plant equipment.

NUPT 220 Reactor Theory 2 credits

Recommended prerequisite NUPT 213. This course will tour the topics that comprise the fundamentals of how reactors are built and operated, giving the student understanding and appreciation of the theory and principles that govern control room operation and activities outside the control room and how they/could they affect the reactor. This course starts with classification of the types of neutrons, and the neutron life cycle. Other topics include reactivity which provides an understanding of what criticality means in terms of reactor operation. Lastly, a discussion of reactor shutdown operation and decay heat removal and significant reactor events.

NUPT 221 Science of Radiological Protection 3 credits

This course will provide the student with a broad, in-depth knowledge of radiological protection principles.

NUPT 223 Reactor Safety Design 3 credits

This course will provide the student with a broad, in-depth knowledge of reactor safety design and protection principles.

NUPT 225 Nuclear Plant System Component Design and Function 4 credits

Recommended prerequisites NUPT 219, 220 and 223. This course will provide the student with a broad, in-depth knowledge of nuclear plant Reactor, Reactor Auxiliaries, Secondary Plant and Electrical Systems.

NUPT 227 Conduct of Facility Operations 4 credits

This course will provide the student with a broad-brush knowledge of the Conduct of Operations as set forth by the Department of Energy (DOE Order 5480.19, Conduct of Operations). This document contains best operating practices found in the commercial nuclear fleet, and as such can be looked at as a summary document for candidate utility workers.

NURSING (NURS) (PHRM)

NURS 100 Nurse Assistant Training F&S SM 1-2 credit

Nursing Assistant Training provides classroom instruction and clinical practice to those preparing for employment as a certified nursing assistant in a skilled nursing facility, acute care, or home health care. Included in the three-week, 88 hour program is classroom instruction, supervised practical training and clinical practice. This course can be taken for credit as NURS 100 or non-credit by contacting the Continuing Education, Training and Innovation Department at (701) 224-5600. Special fees attached based on how the course is delivered.

NURS 120 Foundations of Nursing Fall 3 credits

This course introduces concepts related to the practical nurse's roles and responsibilities in today's society. Emphasis is placed on effective communication, microbiology concepts, basic human needs and nursing concepts, critical thinking, research, and ethical-legal and professional issues. Health promotion and disease prevention concepts are introduced. Upon completion the student will be able to understand the nursing process as it relates to the socially and culturally diverse clients along the health-illness continuum. Prerequisites: ENGL 110, CHEM 115/115L. Corequisites: NURS 121 and 122.

NURS 121 Practical Nursing I Fall 3 credits

This course introduces students to core concepts of pharmacology, nutrition, and health assessment as they relate to the nursing profession. Students will learn basic pharmacological principles, safe administration of medications, health promotion and disease prevention related to nutrition, and the data collection processes of health assessment. Prerequisites: ENGL 110, CHEM 115/115L. Corequisites: NURS 120 and 122.

NURS 122 Clinical Practice I Fall 3 credits

This course takes place in the nursing laboratory and in health care facilities. The student will apply social, biological, behavioral and nursing science principles as they are acquired in the Foundations of Nursing and Practical Nursing I courses. Basic nursing skills and procedures are demonstrated and applied in a supervised laboratory/clinical setting. Beginning Practical Nursing students will begin to participate in the nursing process for clients across the lifespan. Prerequisites: ENGL 110, CHEM 115/115L. Corequisites: NURS 120 and 121.

NURS 124 Clinical Practice II Spring 3 credits

This course takes place in the nursing laboratory and in health care facilities. Complex nursing skills are introduced in the laboratory and applied in the clinical setting utilizing current technology. Clinical experiences will include nursing interventions, pain management, nutrition and drug therapy for disease and infectious processes of culturally diverse clients across the lifespan. Health promotion activities and disease prevention techniques will be incorporated into nursing care of the culturally diverse client. Mental health and therapeutic communication concepts are applied in caring for clients along the health illness continuum. Evidence-based practice is applied in the holistic care of clients across the lifespan. Upon completion the student will assist in the nursing process as a member of the interdisciplinary health care team. Prerequisites: NURS 120, 121, and 122. Corequisite: NURS 123.

NURS 126 Clinical Practice III SM 3 credits

This clinical takes place in a variety of clinical settings. The student will apply evidence-based nursing knowledge and skills in caring for clients across the lifespan with stable or predictable health problems and assisting with those whose conditions are critical or unpredictable. Critical thinking, effective and therapeutic communication, nursing process, management of nursing care, and delegation of unlicensed assistive persons are incorporated into the clinical experience. The student will provide safe and effective nursing care in a legal and ethical manner for clients along the health-illness continuum as an interdisciplinary member of the health care team. Upon completion of this clinical course, the student will have the knowledge and experience to practice in the role of a practical nurse. Prerequisites: NURS 123 and 124. Corequisite: NURS 125.

NURS 127 Practical Nursing II: Introduction to Medical/Surgical Nursing Spring 2 credits

This didactic course expands on prior learning to increase evidenced based knowledge of nursing interventions, pain management, surgery, cancer, trauma and drug therapy for disease and infectious processes of the biopsychosocial individual along the health-illness continuum. This course will integrate teaching and learning activities that enhance critical thinking skills, involvement of clients in decision-making, self-care, health promotion, disease prevention and intervention to responses to illness. Upon completion the student will describe the application of the nursing process in caring for culturally unique clients across the life-span in an ethical and legal manner.

NURS 129 Practical Nursing III SM 4 credits

This course will continue the study of evidence-based nursing interventions, nursing process, nutrition and drug therapy for disease processes of the culturally diverse client across the lifespan along the health-illness continuum. Additional course information will include accountability, roles, responsibilities and ethical, legal and professional issues of the entry level Practical Nurse. The principles of therapeutic communication are expanded and the impact of technology on nursing care is addressed. Prerequisites: NURS 123 and 124. Corequisite: NURS 126.

NURS 145 Introduction to Maternal/Child Nursing Spring 2 credits

This didactic course focuses on nursing care of the culturally diverse woman, infant, and child. Emphasis is placed on health maintenance and selected study of diseases and disorders affecting women, infants, children, and families. Growth and development of the infant and child, and common childhood illnesses are presented. The importance of family centered care and therapeutic communication is addressed. This course will integrate teaching and learning activities that enhance involvement of clients in decision-making, self-care, health promotion and disease prevention.

NURS 224 Professional Role Development Fall 2 credits

This course is designed to assist the licensed practical nurse in transition to the role of the associate degree nurse. Emphasis is placed on the role of the registered nurse; evidence-based practice, nursing process, and therapeutic communication. Historical trends of nursing will be discussed and management concepts will be introduced. Upon completion, students should be able to articulate professional aspects of the practice of nursing. Prerequisite: Admission to the ADN program. Corequisites: NURS 225, 226, and 227.

NURS 225 Alterations in Health I Fall 3 credits
This course introduces concepts related to the nursing care of individuals experiencing acute and chronic alterations in health that build on knowledge and skills introduced in practical nursing programs and the supporting sciences. Emphasis is placed on utilizing scientific principles and the nursing process as a framework for providing and managing nursing care to individuals along the health-illness continuum. Upon completion, students will incorporate basic decision-making skills and therapeutic communication to meet basic human needs for individuals experiencing acute and chronic alterations in health across the lifespan including end-of-life issues. Prerequisite: Admission to the ADN program. Corequisites: NURS 224, 226, and 227.

NURS 226 Maternal Child Nursing Fall 3 credits
This course integrates prior learning to provide expanded knowledge of the neonate, developing child, women's health, and childbearing family. Maintenance and study of diseases and disorders affecting diverse neonates, children, women, and families along the health-illness continuum, including end-of-life issues, are examined. Emphasis is placed on therapeutic communication, the role of the registered nurse, ethical/legal issues and health promotion and maintenance during life stages of growth and development for the neonates, children, and women. As a member of the interdisciplinary health care team, the student will explore the human needs of diverse neonates, children and women, utilizing the nursing process as a framework. Prerequisite: Admission to the ADN program. Corequisites: NURS 224, 225, and 227.

NURS 227 Clinical Application I Fall 4 credits
Utilizing the nursing process, the associate degree nursing student will administer care to meet the needs of individuals across the lifespan. The student will demonstrate assessment skills and apply scientific principles and aseptic technique in caring for individuals across the lifespan along the health-illness continuum. The student will apply therapeutic communication in the management of patient care and as a member of the interdisciplinary health care team. Prerequisite: Admission to the ADN program. Corequisites: NURS 224, 225, and 226.

NURS 228 Alterations in Health II Spring 4 credits
This course continues the study of acute and chronic alterations in health. Nursing care of individuals experiencing complex alterations in health is discussed. Emphasis is placed on the nurse's role as a member of an interdisciplinary team and as a manager of care for individuals across the lifespan. The student will analyze personal and professional values, leadership and management, and quality improvement processes. Upon completion, students will be able to provide comprehensive nursing care for individuals with acute, chronic, and complex alterations in health. Prerequisites: NURS 224, 225, 226, and 227. Corequisites: NURS 229 and 237

NURS 229 Health Promotion and Psychosocial Nursing Spring 2 credits
This course includes concepts related to the nursing care of individuals experiencing alterations in social and psychological functioning. Utilizing the nursing process, the students will explore human needs of individuals with mental health alterations. Utilization of therapeutic communication techniques, use of self and cultural awareness is stressed. Emphasis is also placed on health promotion, health maintenance, and accident/illness prevention for diverse individuals across the lifespan. Prerequisites: NURS 224, 225, 226, and 227. Corequisites: NURS 228 and 237.

NURS 237 Clinical Application II Spring 5 credits
Utilizing the nursing process, the associate degree nursing student will meet the needs of individuals experiencing complex alterations in health as well as psychiatric/mental health issues across the lifespan along the health-illness continuum. Critical thinking, nursing process, group dynamics, and management of nursing care are incorporated into the clinical experience. Students will apply evidence-based nursing knowledge and skills in the implementation of health promotion activities. The student will utilize therapeutic communication and effective management skills in providing nursing care according to legal/ethical and professional standards. Prerequisites: NURS 224, 225, 226, and 227. Corequisites: NURS 228 and 229.

NURS 259 Role Transition Spring 1 credits
This course assists the AD nursing student to prepare for the NCLEX RN® examination and to become a member of the RN workforce. The theoretical component of this course will reinforce and complement prior knowledge gained in the nursing curriculum. Students will utilize the nursing process and critical thinking skills to review previously learned nursing concepts. The course will also provide the student with opportunities to apply basic interview techniques and resume preparation and develop skills for successful employment as a health care professional. It assists the student in making decisions concerning job choices and educational growth. The course stresses the requirement of ongoing education for the RN as a member of the health care team and benefits of professional organizations. Completion of the course will assist students to further prepare for NCLEX. Corequisites: NURS 228, NURS 229, NURS 327.

NURS 294 Independent Study BD 1-3 credits
Independent or directed study of special topics in Practical Nursing. Department chairperson approval is required.

NURS 299 Special Topics BD 1-3 credits
An examination of special topics in nursing.

PHRM 215 Introduction to Pharmacology F&S SM 3 credits
A fundamental discussion of the scope of pharmacology, including terminology used. Drug laws, dosage forms, and patient variabilities that affect drug usage will be covered. Important drugs used in practice will be studied, including basic principles, therapeutic uses, and adverse effects. Prerequisites: BIOL 220/220L and CHEM 115/115L.

NUTRITION (NUTR)

NUTR 240 Principles of Nutrition F&S SM 3 credits
A survey of nutrition through the life cycle. The course will include aspects of digestion, metabolism and clinical applications of nutrition in disease.

PARAMEDIC (EMT-P) TECHNOLOGY (EMS)

EMS 197a Field Internship I BD 1 credit
This course is designed to introduce the Paramedic student to BLS and ALS prehospital operations. The student will become familiar with operations at the dispatch center and the role of quick response units with the sheriff's department. The student will also become familiar with procedures and care provided by paramedics in the field. The student will function under the direction of a preceptor. The student will input patient contact information into the FISDAP Internet data collection system.

EMS 197b Field Internship II BD 1 credit
This course allows the Paramedic student to apply learned classroom skills and knowledge under the direction of a preceptor in a pre-hospital setting. The student will be stationed with a license ALS ambulance service. The student will input patient contact information into the FISDAP data collection system.

EMS 201 Anatomy & Physiology BD 2 credits
This course prepares the student to understand basic medical terminology, micro and gross human anatomy and physiology. The course is designed to go beyond that covered in the anatomy and physiology review of each section in the curriculum. The course is a prerequisite to all other paramedic courses.

EMS 208 Introduction to Advanced Pre-Hospital Care BD 3 credits
This is an introductory course for the Paramedic student. It will build on the knowledge gained during the student's EMT-Basic education and experiences as well as introducing the student to the expanded role of the Paramedic. Topics include roles and responsibilities, EMS systems, The well-being of the paramedic, illness and injury prevention, medical/ legal issues, ethics, general principles of pathophysiology, therapeutic communications, and life span development.

EMS 210 Emergency Pharmacology / Fluid Therapy BD 3 credits
This course introduces the Paramedic student to venous access, IV therapy, basic pharmacological effects on the body, medication administration, and drug calculations.

EMS 212 Airway Management and Ventilation BD 1 credit
This course introduces the Paramedic student to basic and advanced airway management concepts. Skills include, but are not limited to, assessment, airway adjuncts, bag-valve- mask, Combitube, EOA, intubation, and associated pharmacological interventions.

EMS 214 Comprehensive Patient Assessment BD 2 credits
This course introduces the Paramedic student to a comprehensive physical examination and assessment, which includes history taking, clinical decision making, communications, and documentation.

EMS 216 Trauma Management BD 2 credits
This course prepares the student to identify, assess, manage, and treat various types of trauma emergencies. Topics include Trauma Systems, Mechanism of Injury, Soft-Tissue Trauma, Burns, Head and Face Trauma, Spinal Trauma, Thoracic Trauma, Abdominal Trauma, and Musculoskeletal Trauma. Skills include, but are not limited to, assessment, splinting, bandaging, spinal immobilization, IV therapy, chest decompression, and associated pharmacological interventions.

EMS 218 Respiratory Emergencies BD 1 credit
This course prepares the Paramedic student to identify, assess, manage, and treat respiratory emergencies. Skills include, but are not limited to, assessment, nebulizer therapy, and associated pharmacological interventions.

EMS 220 Cardiac Emergencies I BD 2 credits
This course prepares the student to identify single and multi-lead cardiac rhythms and treat those rhythms considered to be life threatening with electrical therapy. Skills include, but are not limited to, assessment, defibrillation, caradioversion, and cardiac rhythm interpretation.

EMS 221 Cardiac Emergencies II BD 2 credits
This course prepares the student to assess, manage, and treat various cardiovascular emergencies. These emergencies include, but are not limited to, ventricular fibrillation, bradycardia, tachycardia, myocardial infarction, cardiogenic shock, pulmonary edema, angina pectoris, congestive heart failure, hypertension, PEA, and asystole.

EMS 222 Medical Emergencies BD 5 credits
This course prepares the Paramedic student to identify, assess, manage, and treat various emergencies. Topics include Neurology, Endocrinology, Allergies and Anaphylaxis, Gastroenterology, Urology, Toxicology, Environmental Conditions, Infectious and Communicable Diseases, Behavioral and Psychiatric Disorders, Gynecological and Obstetrical Emergencies, and associated pharmacological intervention.

EMS 224 Special Considerations BD 3 credits
This course prepares the Paramedic student to identify, assess, manage, and treat age-related emergencies and other special challenges. The student will also be introduced to the concept of assessment based management. Topics include Neonatology, Pediatrics, Geriatrics, Abuse and Assault, Patients with Special Challenges, Acute Interventions for the Chronic Care Patient, Assessment-Based Management, and associated pharmacological interventions.

EMS 226 EMS Operations BD 3 credits
This course introduces the Paramedic student to the concepts of medical incident command, ambulance and rescue operations, hazardous materials incidents, and crime scene awareness. This course will also result in the awarding of certification in Emergency Vehicle Operations and Extrication.

EMS 230 AMLS (Advanced Cardiac Life Support) BD 1 credit
This course will result in the awarding of Advanced Cardiac Life Support Certification for the period of two years from the American Heart Association. It covers all aspects of treating cardiac patients at the advanced level.

EMS 231 PALS (Pediatric Advanced Life Support) BD 1 credit
This course results in the awarding of a Pediatric Advanced Life Support certification from the American Academy of Pediatrics and the American Heart Association. The course covers all aspects of treating pediatric patients.

EMS 232 PHTLS (Pre-hospital Trauma Life Support) BD 1 credit
This course will award a certification in Prehospital Trauma Life Support good for a period of three years. Topics include, but are not limited to Kinematics, Trauma Airway Management, Thoracic Trauma, Extremity Trauma, Thermal Trauma, Shock and Fluid Resuscitation, Head Trauma, Spinal Trauma, and Musculoskeletal Trauma.

EMS 233 CPR-Instructor BD 1 credit
The course prepares the student to become a CPR/BLS Instructor through the American Heart Association. The student will learn various teaching strategies, course organization, and safety issues. The student must carry an AHA healthcare provider card as a prerequisite.

EMS 240 Hospital Clinical I BD 1 credit
This course allows the Paramedic student to apply learned classroom skills and knowledge in clinical settings such as laboratory, preoperative holding, emergency department, anesthesia department, and triage. The student will function under the direction of a preceptor. The student will input patient contact information into the FISDAP Internet data collection system.

EMS 250 Hospital Clinical II BD 1 credit
This course allows the Paramedic student to apply learned classroom skills and knowledge in clinical settings such as anesthesia, emergency department, same-day surgery, operating room, and respiratory care. The student will function under the direction of a preceptor. The student will input patient contact information into the FISDAP Internet data collection system.

EMS 260 Hospital Clinical III BD 1 credit
This course allows the Paramedic student to apply learned classroom skills and knowledge in clinical settings such as telemetry, intensive care unit, psychiatric unit, emergency department, and labor and delivery. The student will function under the direction of a preceptor. The student will input patient contact information into the FISDAP Internet data collection system.

EMS 270 Hospital Clinical IV BD 1 credit
This course allows the Paramedic student to apply learned classroom skills and knowledge in such clinical settings as pediatrics, neonatal intensive care, pediatric operating room, pediatric recovery, and emergency department. The student will function under the direction of a preceptor. The student will input patient contact information into the FISDAP Internet data collection system.

EMS 195-295 Service Learning 1-3 credit
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

EMS 297a Field Internship III BD 1 credit
This course allows the Paramedic student to apply learned classroom skills and knowledge under the direction of a preceptor in a pre-hospital setting. The student will also function as a team leader on selected BLS calls. The student will be stationed with a licensed ALS ambulance service. The student will input patient contact information into the FISDAP Internet data collection system.

EMS 297b Field Internship IV BD 3 credits
This course allows the Paramedic student to apply learned classroom skills and knowledge as a team leader in the pre-hospital setting. The student will function under the direction of a preceptor. The student will input patient contact information into the FISDAP Internet data collection system.

PETROLEUM ENGINEERING TECHNOLOGY (PET)

For updated course descriptions please check Petroleum Engineering Technology pages at bismarckstate.edu/academics.

ENRT 101 Introduction to Energy Technology 4 credits
An introduction to the expanding industry known as "Energy." Students will learn about a variety of energy facilities from traditional to renewable, including but not limited to fossil fuel power plants, petroleum refineries, ethanol and biodiesel facilities, gasification plants, wind farms, geothermal and hydro power production facilities, natural gas processing facilities, petroleum production, water and wastewater treatment and others. The role of the technician in these facilities will be a focus, as will be the expectations and culture of the industry.

ENRT 105 Safety, Health and Environment 3 credits
This course covers the personal protective equipment and proper safe work practices and procedures commonly used in the energy industry. Students will also gain a working knowledge of standard safety, health and environmental practices and regulations set by various government entities.

PET 115 Petroleum Geology 4 credits
Students will be introduced to the field of geology and its application to the discovery and recovery of oil and natural gas. Rocks, minerals and geological processes (i.e., continental drift, mountain building, basin formation, weathering and erosion, etc.) will be studied. Theories of oil and natural gas formation will be discussed, and land forms, geologic patterns and structures associated with hydrocarbon deposits will be described.

PET 115L Petroleum Geology Laboratory 1 credit
Students will gain hands on experience with identifying rocks and minerals as well as recognizing and interpreting topographic and geologic maps; folding and faulting of the crust; analyzing drainage patterns of surface and ground water; earthquake loci; and the development of topographic surfaces through erosion and deposition.

PET 121 Petroleum Data Management I 3 credits
This course offers an overview and introduction to the common computer applications used by the petroleum industry, especially in the areas of exploration, discovery and development of major oil deposits. Students will be using documents, spreadsheets, PowerPoint, AutoCAD and other appropriate software.

PET 221 Petroleum Data Management II 3 credits
Continuation of Petroleum Data Management I; focus is on computer applications required for drilling, production, transportation and storage of oil and natural gas. Significant attention is paid to databases and database management, SQL, GIS applications and industry appropriate software.

PET 131 Petroleum Exploration and Production I 3 credits
Overview of the procedures involved in land and deep-water exploration and development of hydrocarbon deposits. Topics will include drilling and completing wells and development of production systems.

PET 131L Petroleum Exploration and Production I Laboratory 1 credit
Students will be exposed to drilling rigs, drilling rig safety, equipment used in drilling and supporting drilling and well completion activities.

PET 132 Networking for industry 2 credits
Students will study the theory and practice of networking computer systems necessary to extract data during the drilling, extraction and well completion activities. Troubleshooting and development of problem solving skills will be emphasized.

PET 231 Petroleum Exploration and Production II 3 credits
Continuation of PET 131 focusing on geological classifications, beam pumpers, drilling rigs, giant oil and gas fields, fracturing and other high tech, recently developed processes.

PET 231L Petroleum Exploration and Production II Laboratory 1 credit
Students will be exposed to drilling and recovery processes and the engineering technician's role in these activities. Emphasis will be on practical application of relevant computer software, and operation of equipment and instrumentation used by technicians.

PET 241 Principles of Reservoir Engineering 3 credits
Students will study the engineering techniques and calculations used in the development, operation and management of hydrocarbon reservoirs.

PET 251 Well Completions 3 credits
Analysis of drilling and wellbore data needed to develop well completion plan.

PET 255 Petroleum Operations 3 credits
Students will explore the principles and practical applications of onshore and offshore operations leading to hydrocarbon recovery.

PET 258 Natural Gas Production 3 credits
Students will explore the recovery, transport, storage and treatment of natural gas.

PET 258L Natural Gas Production Laboratory 1 credit
Students will engage in hands on application of the principles, equipment and instrumentation used in natural gas production.

PET 261 Petroleum Project Economics 2 credits
Exploration of the factors that determine the profitability of oil fields and the development of data needed to make these determinations.

PETROLEUM PRODUCTION TECHNOLOGY (PROD)

PROD 110 Production Operations Technology 3 credits

The course gives a basic overview of the petroleum industry operations and how they are interrelated. The course will start with the nature of gas and oil, where we find it (geology), geophysics (seismic exploration), land and leasing (drilling preliminaries), the mechanics, problems, techniques of (drilling), testing and completing of a (well), surface equipment, separation, storage, measurement, and sales, (production).

PHARMACOLOGY (PHRM)

SEE NURSING

PHILOSOPHY (PHIL)

PHIL 101 Introduction to Philosophy F&S 3 credits
Examination of the meaning of basic concepts, such as "fact", "mind and matter", "good and evil", "space and time", "change", "divinity", and the influence gender has had on philosophical assumptions. Students must be willing to consider challenging issues from unfamiliar viewpoints. They will be encouraged to look for reasons for belief, to think through issues and clearly express why they agree with or differ from others.

PHIL 210 Ethics Fall 3 credits
An introduction to the problems of moral choice, the meaning of value and the process of making a value judgment. Application of the ethical theory to moral issues and the role of action versus theorizing is discussed.

PHIL 220 Introduction to Logic Spring 3 credits
An introduction to reasoning and argumentation. Students will consider general patterns of arguments, including deduction and induction; fallacies; elementary symbolic logic; and reasoning in different fields such as law, science, the arts, business, and ethics.

PHIL 230 Political Philosophy BD 3 credits
A study of Western political thought from Socrates to the age of ideology. A basic theme is the changing relationship of ethics and politics. Philosophers/political thinkers include: Plato, Aristotle, St. Augustine, Machiavelli, Locke, and Marx.

PHIL 250 Philosophy in Cinema BD 3 credits
This course is a qualitative survey of movies and the ways in which they impact and shape our lives, cultures and institutions. Mixing reality and fiction, films offer an invaluable source for innovative ideas and new approaches for viewing the world around us.

PHIL 294 Independent Study 1-3 credits
Independent or directed study of special topics in philosophy. Department chairperson approval is required.

PHIL 299 Special Topics BD 1-3 credits
Repeatable up to six semester hours. An examination of special topics in philosophy.

PHIL 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

PHIL 197-297 Cooperative Education/Internship F&S SM 1-3 credit hours each
Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

PHLEBOTOMY TECHNICIAN

SEE MEDICAL LABORATORY SCIENCES

PHYSICAL EDUCATION (HPER)

HPER 100 Concepts of Fitness and Wellness F&S 2 credits
Open to all students. Concepts of Fitness and Wellness is designed for the student to receive instruction and participation in the cognitive, affective, and psychomotor domains of personal wellness.

HPER 101 Physical Education Fall 1 credit
Meets two hours per week. May be repeated once. This is an activity class with stress on sports activities. Students who enroll in bowling are charged a fee of $30.

HPER 110 Sports Officiating Fall 2 credits
Required for majors and minors in physical education. Additional laboratory hours in officiating required. Rules and techniques of basketball and wrestling officiating.

HPER 111 Sports Officiating Spring 2 credits
Required of majors and minors in physical education. Rules and techniques of football, baseball, and track officiating.

HPER 150 Varsity Athletics Fall 2 credit
Fundamentals, elementary and advanced skills, conditioning, and strategies.

HPER 151 Varsity Athletics Spring 2 credit
Fundamentals, individual position, play and offensive and defensive team strategies.

HPER 202 Physical Education Spring 1 credit
Activity class meets two hours per week.

HPER 204 Dance Skills/Techniques F&S 1 credit
Fundamentals of standard dance forms covering a broad repertoire of steps and rhythms; encompasses skills in leading, following, style, various dance couple positions and dance etiquette.

HPER 207 Prevention and Care of Injuries
Spring 2 credits

Instruction in the prevention and care of all types of athletic injuries including two hours classroom and one hour training room laboratory. Required of all majors and minors in physical education.

HPER 208 Introduction to Physical Education
Fall 2 credits

Required class for minors and majors in physical education. It is the beginning preparation for those students who are planning careers in physical education, health education and recreation.

HPER 210 First Aid, CPR and AED F&S 1 credit

Open to all students. Responding to emergencies and general directions for giving first aid, artificial resuscitation and defibrillation (AED), and other emergency situations will be covered. American Heart Association Healthcare Provider CPR card and American heart Association First Aid cards will be issued upon successful completion.

HPER 212 Introduction to Self Defense
F&S 1 credit

A comprehensive course in self-defense and personal safety. Students will learn basic awareness, stranger danger tips and techniques to avoid life threatening situations. Specialized skills in escape moves, pressure point tactics and close quarters maneuvers will be taught.

HPER 217 Personal and Community Health
Spring 3 credits

Principles of health and basic understanding of hygiene. Special emphasis on health facts, habits, and attitudes as they relate to home, school, and community. Recommended for all students.

HPER 250 Varsity Athletics Fall 2 credit

Fundamentals of individual and team offense and defense of basketball.

HPER 251 Varsity Athletics Spring 2 credit

Fundamental skills, conditioning, and strategy of tennis and badminton.

HPER 294 Independent Study 1-3 credits

Independent or directed study of special topics in physical education. Department chairperson approval is required.

HPER 299 Special Topics in Physical Education
BD 1-3 credits

Repeatable up to six semester hours. An examination of special topics in physical education and recreation.

HPER 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

HPER 197-297 Cooperative Education/Internship
F&S SM 1-3 credit hours each

Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

PHYSICS (PHYS)

PHYS 100 Concepts of Physics Spring BD 3 credits

Concurrent registration in PHYS 100L is required. An introduction to physics with applications in everyday life. Material is presented from a conceptual rather than mathematical viewpoint. A few fundamental physical laws are studied and applied to explain a wide range of everyday phenomena. The course is designed for students who have a limited mathematical background. Prerequisites: None.

PHYS 100L Concepts of Physics Lab Spring BD 1 credit

Concurrent registration in PHYS 100 is required. Two hours of lab per week. Laboratory to accompany PHYS 100.

PHYS 110 Introductory Astronomy Fall 3 credits

Concurrent registration in PHYS 110L is required. Brief history of ancient astronomy; the Copernican revolution and the beginning of modern astronomy (Copernicus, Kepler, Galileo, Newton); the appearance of the night sky, revolution and rotation of the Earth, celestial coordinate systems, the calendar and seasons; the nature of light and telescopes; structure and origin of the solar system; the Earth, atmospheric phenomena (rainbows, haloes, aurora, etc.) the Moon; the planets and their satellites; comets and solar system debris (asteroids and meteorites); distances and motions of the stars; formation of stellar spectra; the Sun; evolution of ordinary stars; evolution of massive stars and supernovae; neutron stars, pulsars and black holes; the Milky Way and other galaxies; the expanding universe, quasars and cosmology.

PHYS 110L Introductory Astronomy Lab
Fall 1 credit

The lab will include topics that support the lecture (PHYS 110). Labs meet two hours per week. (Concurrent registration in PHYS 100 is required.

PHYS 200 Selected Topics in Physics BD 1-3 credits

This course will be offered on demand to qualified students. Topics dependent upon individual student interest. A documented report is expected from the students. A maximum of four (4) credits may be earned in this manner.

PHYS 211-212 College Physics I-II
211 Fall 212 Spring 3 credits each

PHYS 211 is a prerequisite for 212. Concurrent registration in PHYS 211L for 211; PHYS 212L for 212 is required. Recommended course sequence for pre-medical students. Topics include: Kinematics, mechanics, thermodynamics, waves, electricity and magnetism, and optics. Prerequisites: College algebra or equivalent, trigonometry recommended.

PHYS 211L-212L College Physics I-II Lab
211L Fall 212L Spring 1 credit each

Concurrent registration in PHYS 211 for PHYS 211L; PHYS 212 for PHYS 212L is required. Three hours of lab per week. Laboratories to accompany PHYS 211 and 212.

PHYS 251-252 University Physics I-II
251 Fall 252 Spring 4 credits each

Concurrent registration in PHYS 251L for 251; PHYS 252L for 252 is required. Classical physics using calculus for majors in mathematics, physical sciences and engineering. Topics may include: kinematics, mechanics, thermodynamics, waves, electricity and magnetism, and optics. Prerequisites: MATH 165 for 251, MATH 166 for 252. 251 is prerequisite for 252.

PHYS 251L-252L University Physics I-II Lab
251L Fall 252L Spring 1 credit each
Concurrent registration in PHYS 251 for PHYS 251L; PHYS 252 for PHYS 252L is required. Three hours of lab per week. Laboratories to accompany PHYS 251 and 252.

PHYS 294 Independent Study 1-3 credits
Independent or directed study of special topics in physics. Department chairperson approval is required.

PHYS 299 Special Topics in Physics BD 1-3 credits
Repeatable up to six semester hours. An examination of special topics in physics.

PHYS 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

PHYS 197-297 Cooperative Education/Internship F&S SM 1-3 credit hours each
Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

PLANT SCIENCE (PLSC)
SEE AGRICULTURE

POLITICAL SCIENCE (POLS)

POLS 115 American Government F&S SM 3 credits
National government is emphasized. Topics include: political personalities, power, political socialization, current political and social issues, public opinion, the mass media, voting, campaigning, the Presidency, the Congress, the courts, the bureaucracy, and domestic and foreign policies.

POLS 116 State and Local Government F&S 3 credits
State and community government is emphasized. Topics include: state and community politics and participation, federalism, state legislators and councilmen, governors and mayors, the courts, metropolitics, the issues of crime, education, transportation, poverty, welfare, budgeting and taxation.

POLS 195 Student Government F&S 1-3 credits
An exploration of principles of leadership, and the application of these principles, to the planning and implementation of club and institutional activities.

POLS 220 International Politics Spring 3 credits
The U.S. role in world politics is emphasized. Topics include: the national interest, international morality, diplomacy, the world's resources, elements of national power, the limits of power, resolution of conflict and the 1970s and beyond.

POLS 240 Political Ideologies BD 3 credits
This is a four hundred year study of American ideas and ideologies. This includes: the American dream, revolutionary thought, the individual in democratic society, abolitionism, liberalism and conservatism. SS.

POLS 294 Independent Study 1-3 credits
Independent or directed study of special topics in political science. Department chairperson approval is required.

POLS 299 Special Topics in Political Science BD 1-3 credits
Repeatable up to six semester hours. An examination of the special topics in political science.

POLS 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

POLS 197-297 Cooperative Education/Internship F&S SM 1-3 credit hours each
Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

POWER PLANT TECHNOLOGY (ENRT, PWRP)
Check BSC's Energy Education website, bismarckstate.edu/energy, or contact your advisor for the most up-to-date list of course offerings and schedule.

ENRT 101 Introduction to Energy Technology 4 credits
An introduction to the expanding industry known as "Energy." Students will learn about a variety of energy facilities from traditional to renewable, including but not limited to fossil fuel power plants, petroleum refineries, ethanol and biodiesel facilities, gasification plants, wind farms, geothermal and hydro power production facilities, natural gas processing facilities, petroleum production, water and wastewater treatment and others. The role of the technician in these facilities will be a focus, as will be the expectations and culture of the industry.

ENRT 103 Applied Math 3 credits
This course includes math skills and how they apply to the energy industry. Students will learn volume and area calculations as well as conversions of temperature, pressure, level and flow through the use of algebra, trigonometry, and other math applications.

ENRT 104 Electrical Fundamentals 3 credits
This course covers basic direct current theories and applies those to the electrical system and related equipment. Students will also study basic DC circuit calculations. This course will also cover basic alternating current theories and apply those theories to electrical systems and related equipment. Students will study various methods of producing a voltage. Students will also study essential generator and motor design, construction and operating principles.

ENRT 105 Safety, Health and Environment 3 credits

This course covers the personal protective equipment and proper safe work practices and procedures commonly used in the energy industry. Students will also gain a working knowledge of standard safety, health and environmental practices and regulations set by various government entities.

ENRT 107 Mechanical Fundamentals Fall 2 credits

This course introduces mechanical concepts commonly found in a plant setting. This course provides students with an overview of piping systems including dimensions, connections, blinding and more. Students will become familiar with common hand tools and terminology found in many plants. Students will learn about steam traps, strainers and their applications. Students are introduced to common pumps and drivers, compressors and fans and heat exchangers.

ENRT 108 AC Fundamentals 3 credits

This course covers basic alternating current theories and applies those theories to electrical systems and related equipment. Students will also study basic generator and motor design, construction and operating principles.

ENRT 110 Plant Equipment and Systems F&S 4 credits

This course provides the student extensive information on equipment This course provides an introduction to equipment used in power, process and renewable industry. Valves, piping, pumps, compressors, generators, turbines, motors, lubrication systems, heat exchangers, furnaces, boilers, cooling towers, separators, reactors, and distillation columns are covered. The utilization of this equipment within systems will be covered.

ENRT 112 Print Reading 3 credits

This course covers schematics, prints, and piping and instrument diagrams used in the energy industry. Students will learn how to read and interpret block and single-line diagrams, which will prepare them for the logic and electrical schematics included in this course.

ENRT 116 Instrumentation & Control 4 credits

This course provides a comprehensive look and study of instrumentation components, control theory, control systems and typical controllers associated with the operation of energy facilities.

ENRT 118 Heat Transfer, Fluid Flow & Thermodynamics 3 credits

Students enrolled in this course will study heat transfer, fluid flow and the conservation of energy. Specific equipment design considerations based on thermodynamic principles will be covered.

ENRT 120 Water Purification and Treatment 3 credits

This course covers industrial water treatment processes. Students will study boiler water treatment, raw water treatment and the design and operation of ion exchangers. The course also covers cooling water treatment equipment and waste water treatment equipment and systems.

ENRT 205 Steam Generation 3 credits

In this course the various types of boilers, systems, components and auxiliary systems associated with steam generators are covered, Different designs of boilers will be covered including low/high pressure, fire tube/water tube, negative/positive draft, drum type, supercritical and fluidized bed boilers. Boiler operation, combustion, safety and emission control equipment will be covered along with efficiency measures.

ENRT 215 Operations, Troubleshooting & Communication 3 credits

Students will gain the knowledge necessary to comprehend overall plant operations and respond to abnormal operating conditions. Students will also participate in root cause analysis exercises while troubleshooting different operating scenarios. This course is designed to provide instruction in the different types of troubleshooting techniques, procedures, and methods used to solve process problems. Students will use existing knowledge of equipment, systems and instrumentation to understand the operation of an entire unit in a facility. Students study concepts related to commissioning, normal startup, normal operations, normal shutdown, turnarounds, and abnormal situations, as well as the process technician's individual and team role in performing tasks associated with these concepts within an operating unit.

ENRT 220 Practical Applications 2 credits

Students will participate in hands-on lab activities, internships or industry job shadowing to gain entry-level job competencies.

PWRP 203 Energy Sources and Conversions 2 credits

Students enrolled in this course will study the various forms of energy and the processes used to convert chemical and potential energy into thermal, mechanical and in some instances electrical energy. Energy sources that will be studied include fossil fuels (coal, oil and natural gas), hydro, wind, fuel cells, solar, derived fuel, geothermal and nuclear. Combustion and reaction will be discussed in detail for those energy sources that require combustion to convert from one energy form to another.

PWRP 207 Boilers & Environmental Protection 3 credits

In this course, students will gain a more thorough understanding of the various types of boilers, systems, components and auxiliary systems associated with steam generation. Topics covered include low/high pressure, fire tube/water tube, negative/positive draft, drum type, supercritical and fluidized bed boilers. Boiler operation, combustion, safety and emission control equipment will be covered along with efficiency measures.

PWRP 210 Turbines & Combined Cycle Operations 3 credits

Students enrolled in this course will study all the elements that make up a gas turbine and a combined cycle unit. This course also covers the safe and efficient operation of gas turbines and heat recovery steam generators and their different applications as used in combine cycle and cogeneration configurations. Coal gasification is also studied. This course covers basic steam turbine construction and design and associated auxiliary systems. Students will learn how thermal energy is converted to mechanical energy as the steam passes through a typical industry steam turbine. Students will also study the auxiliary systems associated with steam turbine operation, including extraction steam systems, gland steam sealing systems, turbine lube oil systems, seal oil systems, instrumentation and control devices and protective schemes used during abnormal operating conditions. Steam turbine start-up and shut-down procedures will also be studied.

PWRP 214 Power Generation, Components & Protection 2 credits

Students enrolled in this course will study the design and construction of large industrial generators used in the production of electricity. Students will study the various exciter designs and operation and the various auxiliary equipment that supports generator operation. Students enrolled in this course will study the electrical systems from the main generator through the switchyard including the various relay and protection schemes and zones. Safety aspects and operational checks in regards to placing electrical systems and components in and out of service will also be covered.

PRIOR LEARNING ASSESSMENT (PLA)

PLA 201 Prior Learning Assessment: Portfolio
BD 2 credits

This is a course to help students prepare a portfolio describing and documenting their learning from experience. Upon completion, the portfolio may be evaluated and college credit is awarded to the extent the learning is college-equivalent.

PROCESS PLANT TECHNOLOGY (ENRT, PROP)

Check BSC's Energy Education website, bismarckstate.edu/energy, or contact your advisor for the most up-to-date list of course offerings and schedule.

ENRT 101 Introduction to Energy Technology 4 credits

An introduction to the expanding industry known as "Energy." Students will learn about a variety of energy facilities from traditional to renewable, including but not limited to fossil fuel power plants, petroleum refineries, ethanol and biodiesel facilities, gasification plants, wind farms, geothermal and hydro power production facilities, natural gas processing facilities, petroleum production, water and wastewater treatment and others. The role of the technician in these facilities will be a focus, as will be the expectations and culture of the industry.

ENRT 103 Applied Math 3 credits

This course includes math skills and how they apply to the energy industry. Students will learn volume and area calculations as well as conversions of temperature, pressure, level and flow through the use of algebra, trigonometry, and other math applications.

ENRT 104 Electrical Fundamentals 3 credits

This course covers basic direct current theories and applies those to the electrical system and related equipment. Students will also study basic DC circuit calculations. This course will also cover basic alternating current theories and apply those theories to electrical systems and related equipment. Students will study various methods of producing a voltage. Students will also study essential generator and motor design, construction and operating principles.

ENRT 105 Safety, Health and Environment 3 credits

This course covers the personal protective equipment and proper safe work practices and procedures commonly used in the energy industry. Students will also gain a working knowledge of standard safety, health and environmental practices and regulations set by various government entities.

ENRT 107 Mechanical Fundamentals 2 credits

This course introduces mechanical concepts commonly found in a plant setting. This course provides students with an overview of piping systems including dimensions, connections, blinding and more. Students will become familiar with common hand tools and terminology found in many plants. Students will learn about steam traps, strainers and their applications. Students are introduced to common pumps and drivers, compressors and fans and heat exchangers.

ENRT 110 Plant Equipment and Systems 4 credits

This course provides an introduction to equipment used in power, process and renewable industries. Valves, piping, pumps, compressors, generators, turbines, motors, lubrication systems, heat exchangers, furnaces, boilers, cooling towers, separators, reactors, and distillation columns are covered. The utilization of this equipment within systems will be covered.

ENRT 112 Print Reading 3 credits

This course covers schematics, prints, and piping and instrument diagrams used in the energy industry. Students will learn how to read and interpret block and single-line diagrams, which will prepare them for the logic and electrical schematics included in this course.

ENRT 116 Instrumentation & Control 4 credits

This course provides a comprehensive look and study of instrumentation components, control theory, control systems and typical controllers associated with the operation of energy facilities.

ENRT 118 Heat Transfer, Fluid Flow & Thermodynamics 3 credits

Students enrolled in this course will study heat transfer, fluid flow and the conservation of energy. Specific equipment design considerations based on thermodynamic principles will be covered.

ENRT 120 Water Purification and Treatment 2 credits

This course covers industrial water treatment processes. Students will study boiler water treatment, raw water treatment and the design and operation of ion exchangers. The course also covers cooling water treatment equipment and waste water treatment equipment and systems.

ENRT 205 Steam Generation 3 credits

In this course the various types of boilers, systems, components and auxiliary systems associated with steam generators are covered. Different designs of boilers will be covered including low/high pressure, fire tube/water tube, negative/positive draft, drum type, supercritical and fluidized bed boilers. Boiler operation, combustion, safety and emission control equipment will be covered along with efficiency measures.

ENRT 218 Operations, Troubleshooting & Communication 3 credits

Students will gain the knowledge necessary to comprehend overall plant operations and respond to abnormal operating conditions. Students will also participate in root cause analysis exercises while troubleshooting different operating scenarios. This course is designed to provide instruction in the different types of troubleshooting techniques, procedures, and methods used to solve process problems. Students will use existing knowledge of equipment, systems and instrumentation to understand the operation of an entire unit in a facility. Students study concepts related to commissioning, normal startup, normal operations, normal shutdown, turnarounds, and abnormal situations, as well as the process technician's individual and team role in performing tasks associated with these concepts within an operating unit.

ENRT 220 Practical Applications 2 credits

Students will participate in hands-on lab activities, internships or industry job shadowing to gain entry-level job competencies

PROP 235 Hydrocarbon Chemistry 3 credits

This course provides a fundamental study of the organic chemistry of hydrocarbons associated with crude oil. This course will also focus on process chemistry, chemistry fundamentals, typical process reactions and process solubility theory.

PROP 237 Distillation & Refinery Operations 3 credits

This course provides a comprehensive study of processes associated with refining, and petrochemical distillation. This course will also focus on equipment designs, operation requirements and technician responsibilities associated with the operation of typical distillation facilities.

PROP 239 Gas Processing 3 credits

This course provides a comprehensive study of the processing technologies associated with the production of natural gas and other gases and liquids found within natural gas fields. Students will study gas laws, molecular structure, process theory, terminology, equipment and the auxiliary systems that support the production and processing of natural gas. The production of synthetic natural gas by means of coal gasification will be covered.

PROP 244 Ethanol and Biofuels Production 4 credits

Students enrolled in this course will study the design, operation, equipment and process flows of ethanol plants and biofuels facilities including biodiesel plants. The student will have the ability to interpret basic flow diagrams and understand related terminology. The equipment design and operation used in these facilities will be a focus as well as safety considerations, typical maintenance, and startup/shutdown procedures.

PSYCHOLOGY (PSYC)

PSYC 100 Human Relations in Organizations BD 2 credits

This course is an exploration of interpersonal relationships in and out of any occupational environment. Topics include: communication, motivation, leadership and teamwork.

PSYC 105 Relationships and Self Esteem F&S SM 2 credits

This course discusses career options, financial budgeting, interpersonal communication, family relations, and parenting skills. Emphasis is on self-esteem and motivational techniques to achieve personal goals.

PSYC 107 Mental Skills Training for Performance Excellence Fall 2 credits

This is a hands-on course designed to help students gain practical knowledge and learn how to improve their personal performance. Using specific mental training tools, students will learn how to develop mental toughness and resilience when practicing, competing, and presenting – to become the best they can be in athletics, on stage, in the classroom, in business, and in life.

PSYC 111 Introduction to Psychology F&S SM3 credits

Psychology is a science that attempts to understand and predict behavior and to study its relationship to unseen mental processes and to external events in the environment. Subject matter includes the learning processes, perception, motives, emotions, personality, developmental, social and abnormal behavior. This course is a general prerequisite to other psychology courses.

PSYC 211 Introduction to Behavior Modification Spring 3 credits

Basic principles and procedures for acquiring, maintaining and changing behavior, emphasizing human applications. Major assignment involves designing, implementing, and reporting an individual project. Prerequisite: Psychology 111.

PSYC 230 Educational Psychology F&S 3 credits

The application of psychology principles of development; perception and learning; and motivation to contemporary educational problems — classroom management, planning and effective teaching, student testing and evaluation, and parent/home issues. Prerequisite: Psychology 111. Recommend completion of Psychology 211 or Psychology 250.

PSYC 250 Developmental Psychology F&S SM 3 credits

A study of human development through the life-span with an emphasis on physical, cognitive, social, emotional and personality development. Prerequisite: Psychology 111.

PSYC 252 Child Psychology Fall 3 credits

Overview of theories of human development from conception through childhood including physical, cognitive, language, social, and self help skills in family, school, and community settings. Prerequisite: Psychology 111.

PSYC 261 Psychology of Adjustment BD 3 credits

Principles of the normal range of adjustment mechanism in behavior as it responds to life situations and changes. Prerequisite: Psychology 111 or consent of instructor.

PSYC 270 Abnormal Psychology F&S 3 credits

A study of psychopathology, comparison to functional normal behavior, and related issues. This course examines the current clinical and experimental findings and theories regarding the etiology, symptoms, and treatment of these important and sometimes devastating disorders. Prerequisite: Psychology 111.

PSYC 276 Social Psychology Fall 3 credits

An interdisciplinary approach to the study of individual behavior in its social context: how people influence, and are influenced by, the others around them. Prerequisite: PSYC 111.

PSYC 299 Special Topics in Psychology BD 1-3 credits

Repeatable up to six semester hours. An examination of special topics in psychology.

PSYC 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

PSYC 197-297 Cooperative Education/Internship F&S SM 1-3 credit hours each

Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

REFRIGERATION (REFG)

SEE HEATING, VENTILATION AND AIR CONDITIONING

RELIGION (RELS)

RELS 120 Religion in America Fall 3 credits

An introduction to the rich variety of religious expressions in the United States. Mainline Christians, lesser known groups, and some Eastern religions will be visited by lecture, reading and guest speakers.

RELS 201 Life and Letters of Paul Spring 3 credits

This course develops a deeper understanding and a heightened appreciation for Paul, the infamous persecutor of Christians, who eventually became the first great Christian missionary, and whose writings were canonized as a major portion of the New Testament.

RELS 203 World Religions F&S 3 credits
An introduction to the origin and major tenants of Hinduism, Buddhism, Confucianism, Daoism, Judaism, Christianity and Islam by lecture, reading, discussion and video.

RELS 220 Old Testament Fall 3 credits
A study of the religious, political, and social history of ancient Israel as reflected in the Hebrew Bible. The focus is from Abraham to Jesus.

RELS 230 New Testament Spring 3 credits
A study of the New Testament and other writings that came into being between 50 and 150 C.E. This includes the canonical gospels, history, epistles and apocalypse, along with several other gospels and epistles that did not make it into the accepted 27. Texts are analyzed by using contemporary literal-historical, redactional, comparative, and thematic methods.

RELS 294 Independent Study 1-3 credits
Independent or directed study of special topics in religion. Department chairperson approval is required.

RELS 299 Special Topics BD 1-3 credits
Repeatable up to six semester hours. An examination of special topics in religion.

RELS 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

RELS 197-297 Cooperative Education/Internship F&S SM 1-3 credit hours each
Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

RENEWABLE GENERATION TECHNOLOGY (RENG) (ENRT)

ENRT 101 Introduction to Energy Technology 4 credits
An introduction to the expanding industry known as "Energy." Students will learn about a variety of energy facilities from traditional to renewable, including but not limited to fossil fuel power plants, petroleum refineries, ethanol and biodiesel facilities, gasification plants, wind farms, geothermal and hydro power production facilities, natural gas processing facilities, petroleum production, water and wastewater treatment and others. The role of the technician in these facilities will be a focus, as will be the expectations and culture of the industry.

ENRT 105 Safety, Health & Environment 3 credits
This course covers the personal protective equipment and proper safe work practices and procedures commonly used in the energy industry. Students will also gain a working knowledge of standard safety, health and environmental practices and regulations set by various government entities.

ENRT 107 Mechanical Fundamentals 2 credits
This course introduces mechanical concepts commonly found in a plant setting. This course provides students with an overview of piping systems including dimensions, connections, blinding and more. Students will become familiar with common hand tools and terminology found in many plants. Students will learn about steam traps, strainers and their applications. Students are introduced to common pumps and drivers, compressors and fans and heat exchangers.

ENRT 110 Plant Equipment & Systems 4 credits
This course provides an introduction to equipment used in power, process and renewable industries. Valves, piping, pumps, compressors, generators, turbines, motors, lubrication systems, heat exchangers, furnaces, boilers, cooling towers, separators, reactors, and distillation columns are covered. The utilization of this equipment within systems will be covered.

ENRT 112 Print Reading 3 credits
This course covers schematics, prints, and piping and instrument diagrams used in the energy industry. Students will learn how to read and interpret block and single-line diagrams, which will prepare them for the logic and electrical schematics included in this course.

ENRT 103 Applied Math 3 credits
This course includes math skills and how they apply to the energy industry. Students will learn volume and area calculations as well as conversions of temperature, pressure, level and flow through the use of algebra, trigonometry, and other math applications.

ENRT 104 Electrical Fundamentals 3 credits
This course covers basic direct current theories and applies those to the electrical system and related equipment. Students will also study basic DC circuit calculations. This course will also cover basic alternating current theories and apply those theories to electrical systems and related equipment. Students will study various methods of producing a voltage. Students will also study essential generator and motor design, construction and operating principles.

ENRT 116 Instrumentation & Control 4 credits
This course provides a comprehensive look and study of instrumentation components, control theory, control systems and typical controllers associated with the operation of energy facilities.

RENG 210 Safe Work Practices 3 credits
This course covers specific work practices in the areas of electricity, elevated work and rigging. OSHA standards and safe permitting practices are components of this course.

RENG 213 Hydraulic Fundamentals 3 credits
This course covers principles and operation of hydraulic systems. Hydraulic system analysis and troubleshooting in the lab setting is part of this course.

RENG 216 Advanced Mechanical 4 credits
Building on the Mechanical Fundamentals course, the focus of this course is the application of mechanical skills and knowledge to the industrial setting. Demonstration by the student in the areas of "torquing", measurements, gap adjustments and shaft alignments is included. An emphasis on practical lab work is part of this course.

RENG 218 Solar and Distributed Grid Systems 4 credits
This course includes an in-depth study of grid-direct solar arrays, small wind systems and other distributed grid systems. Sizing and installation of systems as well as student lab work are included in this course.

RENG 221 Applied Electronics 3 credits
This course focuses on the electronic components and devices that are critical in the operation of renewable energy facilities. Students will understand their function and how to troubleshoot them.

RENG 224 Automation and Control 3 credits
Students will learn the control devices used to operate motors and generators in an industrial or renewable power generation facility. Some of the equipment covered: relays, contactors, motor starters, PLCs and variable frequency drives. Practical labs are included to demonstrate the student's comprehension.

RENG 226 Commercial Wind Systems 3 credits
Commercial wind turbine systems are the focus of this course. The interoperation of the subsystems in a commercial wind turbine, the tracking and data acquisition using SCADA systems and the distribution of the generated power are covered in this course. The technician's role in the successful operation of the facility is another component of this course.

RENG 228 Renewable Applications and Troubleshooting 5 credits
This course, primarily a hands-on course, takes the core skills learned and integrates them into practice. Lab systems included are hydraulic, mechanical, electric motors, PLCs, and other control systems. This course will develop and test the students' troubleshooting skills and prepare them to work safely and effectively in an industrial or renewable power generation facility.

SCIENCE (SCNC)

SCNC 100 Success in STEM Careers F&S 1 credit
Restricted enrollment for STEM scholars only. This course is designed to increase retention and success of Science Technology Engineering and Math (STEM) scholarship recipients. Scholarships are based upon academic merit, financial need and project criterion. The S-STEM seminar blends online and on-campus course components aimed at enhancement of student success. Distance only scholars enrolled in the seminar will participate in activities comparable to and associated with the on-campus meetings.

SCNC 101 Physical Science I Spring 3 credits
SCNC 102 Physical Science II Fall 3 credits
SCNC 103 Physical Science III F&S 3 credits
These courses are organized to fulfill the science requirement of the elementary education curriculum and to meet the need of the student planning a non-science major. The fundamentals of biology and chemistry are covered in 101, physics and geology in 102, and astronomy and meteorology in 103. Three hours of lecture will be held weekly. There are no prerequisites, and the course cannot be applied to a major in science. Concurrent registration in SCNC 101L-102L-103L is required.

SCNC 101L Physical Science I Lab Spring 1 credit
SCNC 102L Physical Science II Lab Fall 1 credit
SCNC 103L Physical Science III Lab F&S 1 credit
Two hours per week. These courses are designed to fulfill the lab science requirement for the student planning a non-science major. Laboratory techniques in biology and chemistry are covered in 101L, physics and geology in 102L, and astronomy and meteorology in 103L. Concurrent registration in SCNC 101-102-103 is required.

SCNC 294 Independent Study 1-3 credits
Independent or directed study of special topics in science. Department chairperson approval is required.

SCNC 299 Special Topics in Science BD 1-3 credits
Repeatable up to six semester hours. An examination of special topics in science.

SCNC 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

SCNC 197-297 Cooperative Education/Internship F&S SM 1-3 credit hours each
Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

SHEET METAL (SMTL)

SEE HEATING

SOCIAL WORK (SWK)

SWK 256 Development of Social Welfare F&S 3 credits
This course provides an introduction to the development of social welfare, its historic landmarks, and the values and ideologies that influence social welfare. Information about inequality and the major social welfare programs that benefit the disadvantaged is included.

SOCIOLOGY (ASC, SOC)

ACADEMIC SKILLS COURSES

ASC 076 Applied Study Skills Fall 1 credit
An embedded study skills application for specific content areas. Learning and study strategies will be presented and applied using students' texts and classroom assignments. Instruction includes handouts, study guides, cooperative and individualized learning, and computer instruction.

COLLEGE CREDIT COURSES

SOC 110 Introduction to Sociology F&S SM 3 credits
Sociology is the study of the development and maintenance of human society and the process and products of culture. This course provides a basic foundation of vocabulary, concepts and theories that will enable students to investigate, evaluate and understand the social world in which we live.

SOC 115 Social Problems F&S 3 credits
Utilizing a critical thought approach, this course identifies those social conditions that are recognized as problematic to society. Students will analyze and evaluate the factors that create, maintain or change social problems in our society.

SOC 120 Transition to College Life/Seminar 2 credits

This course is designed to ease the transition for new students to Bismarck State College. The students will learn skills and techniques used by successful college students. Some topics include: learning/ study skills, academic planning, time management, leadership, interpersonal relations, and career planning.

SOC 123 Investigations in Environmental Problems BD 1-3 credits

Maximum of three credits. Student project or discussion topics will be designed to meet the needs of individual students or small groups. Instructor's consent required.

SOC 220 Family Fall 3 credits

The institution of family will be analyzed utilizing a sociological perspective. The focus will be on courtship, marriage, family, communication and child rearing.

SOC 221 Minority Relations F&S 3 credits

A study of the relations between advantaged and disadvantaged groups in American society. The experience and present status of racial and ethnic groups are examined.

SOC 225 Death and Dying Spring 3 credits

The course takes an intellectual view of the process of dying, bereavement and grief. Issues to be addressed include the differences in age groups when dealing with either their own death or the death of a loved one; various end-of-life issues such as assisted suicide, living wills and organ donations; and the various theories associated with death and dying.

SOC 235 Cultural Diversity F&S 3 credits

This course is an introductory survey of the racial, ethnic and cultural mosaic of American society. Basic theories of intragroup and intergroup relations, prejudice and discrimination are covered.

SOC 251 Gerontology Spring 3 credits

Gerontology is the interdisciplinary study of the processes of aging and the experience of growing old. This includes the sociological, psychological and biological aspects of aging. .

SOC 252 Criminology F&S 3 credits

A study of theories from religious, political, psychological, biological and sociological perspectives that attempt to explain crime, criminals, and criminal behavior.

SOC 253 Juvenile Delinquency Fall 3 credits

A critical evaluation of the role of the family, school, community officials, social agencies, and community programs and institutions in delinquency prevention and control.

SOC 275 American Indian Studies F&S SM 3 credits

This course is designed to meet requirements of the Education Standards and Practices Board, which is the program approval entity for teacher education programs in North Dakota, that teachers in North Dakota schools possess an understanding of the histories and cultures of native people in North Dakota. Students will become familiar with United States Federal Indian policy history, the concept of tribal sovereignty, as well as the cultures, histories and traditions of American Indian tribes in North Dakota and surrounding areas.

SOC 294 Independent Study 1-3 credits

Independent or directed study of special topics in sociology. Department chairperson approval is required.

SOC 299 Special Topics in Sociology BD 1-3 credits

Repeatable up to six semester hours. An examination of special topics in sociology.

SOC 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

SOC 197-297 Cooperative Education/Internship F&S SM

1-3 credit hours each

Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

SOIL (SOIL)

SEE AGRICULTURE

SPANISH (SPAN)

SPAN 101-102 First Year Spanish I and II 101 F&S 102 F&S 4 credits

Fundamentals of Spanish grammar, oral and written use of the language and readings in easy Spanish. No prerequisite for 101. Spanish 101 or one year of high school Spanish prerequisite for 102.

SPAN 201-202 Second-Year Spanish I-II 201 Fall 202 Spring 4 credits

Review of structure of Spanish, advanced grammar, and practice in written and oral expression. Reading in Spanish and Latin-American literature and culture. Prerequisite: Spanish 101-102 or their equivalent (see Foreign Language Curriculum section).

SPAN 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

SPAN 294 Independent Study 1-3 credits

Independent or directed study of special topics in Spanish. Department chairperson approval is required. Repeatable up to six semester hours.

SPAN 299 Special Topics in Spanish BD 1-3 credits

Repeatable up to six semester hours. An examination of special topics in Spanish.

SPEECH COMMUNICATION (COMM)

COMM 110 Fundamentals of Public Speaking F&S SM 3 credits

The course is designed to lay a foundation in skills for informal and formal speaking situations. There is an emphasis on content, organization, audience adaptation, critical evaluation of messages, language, and delivery.

COMM 211 Oral Interpretation Fall 3 credits

The techniques of expression as applied to oral reading are studied and practiced. Students are encouraged to use all types of literature to secure an understanding of the intellectual and emotional content of the literature and to communicate this meaning to the listener.

COMM 212 Interpersonal Communications F&S 3 credits

This course will acquaint students with fundamental concepts of communications between individuals. Course will give insights into the dynamics of interpersonal communication, aid in understanding how people present themselves to others, and how others perceive them in turn.

COMM 214 Persuasive Speaking BD 3 credits

This course will examine principles of motivation, argumentation and techniques utilized in influencing human conduct. Student will prepare, deliver, and analyze various types of persuasive messages.

COMM 222 Voice and Diction Spring 3 credits

Studies and exercises designed to develop the "career voice." For students going into fields where the quality of public vocal presentation is important.

COMM 271 Listening and Nonverbal Communication BD 3 credits

This course will examine the activity of listening as a process and skill by examining theories and practices in the field. The course will also help students identify specific barriers to effective listening and strategies and tools to overcome listening problems.

COMM 282 Yearbook Editing F&S 1-2 credits

Laboratory course for members of yearbook staff.

COMM 294 Independent Study 1-3 credits

Independent or directed study of special topics in speech communication. Department chairperson approval required.

COMM 299 Special Topics in Speech Communication BD 1-3 credits

Repeatable up to six semester hours. An examination of special topics in speech.

COMM 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

COMM 197-297 Cooperative Education/Internship F&S SM

1-3 credit hours each

Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

SURGICAL TECHNOLOGY (SRGT)

SRGT 105 Medical Terminology for Surgical Technology Fall 3 credits

Three semester credit hours of lecture per week. This course will cover the basic knowledge of medical terminology that the surgical technologist needs to function effectively in the health care setting. The student will learn correct pronunciation and spelling of medical terms. The 12 body systems are reviewed with emphasis on the terminology of anatomy, pathology, diagnosis, and treatment for each system. Symbols and abbreviations used in medical terminology are identified throughout the course. This is an open enrollment course for any interested student. It does not require admission to the Surgical Technology program, nor does enrollment in this course guarantee admission to the Surgical Technology program.

SRGT 110 Introduction to Surgical Technology Spring 3 credits

SRGT 110 will cover the fundamentals of working as a surgical technologist. Included will be discussions of the surgical technologist and the field of surgical technology, professional credentialing, and the disciplines of other surgical team members. The organizational structure of health care facilities and their financing, hospital departments and interdepartmental communication will continue the semester. Surgical suite design, individual operating room design, safety considerations and communication skills for the surgical technologist will complete the semester. Prerequisites: BIOL 220, 220L. Corequisites: SRGT 120, SRGT 130, SRGT 125L

SRGT 120 Introduction to Operating Room Procedures Spring 3 credits

This course is the introduction to patient care concepts. Introduction to the principles of asepsis, the surgical conscience, and disinfection and antisepsis begin the semester. Included will be discussion of preoperative routines, positioning and prepping the patient, and care of surgical specimens. Prerequisites: BIOL 220, 220L. Corequisite: SRGT 110, SRGT 125L, SRGT 130.

SRGT 125L Introduction to Operating Room Procedures and Materials Lab Spring 2 credits

This course will begin with the introduction to the principles of asepsis, surgical conscience, and disinfection and antisepsis. The instrumentation, equipment and other materials utilized by the surgical technologist in the practice setting will be introduced. Included will be the types and function of surgical instruments and equipment, and sterile disposable surgical supplies. The routine procedures for patient preparation and admission to the operating room are practiced. These procedures will include patient identification and transportation to the operating room. The semester will continue with positioning for surgery and surgical skin preparation, along with instruction in the use of suture and needles, sterile set up, opening and preparation of instruments and supplies for any operative procedure. The semester concludes with the care and handling of surgical specimens and instruction in the use of draping materials for any operative procedure. Corequisites: SRGT 110, SRGT 120, SRGT 130. Prerequisites: BIOL 220, BIOL 220L.

SRGT 130 Introduction to Operating Room Materials Spring 3 credits

This course will cover the instrumentation, equipment and other materials utilized by the surgical technologist in the practice setting. Included will be the types and function of surgical instruments and equipment, and surgical supplies. Instruction in the use of suture, needles, and draping materials with the set up, opening and preparation of instruments and supplies for any operative procedure will complete the semester. Prerequisites: BIOL 220, 220L. Corequisites: SRGT 110, SRGT 120, SRGT 125L.

SRGT 215 Introduction to Pharmacology for Surgical Technology Fall 3 credits

This course will cover the basic knowledge of pharmacology that the surgical technologist is required to have for safe patient care. The student will identify the various systems of dosage and measurement utilized in standard pharmacology, convert equivalents from one system to another, and accurately identify, prepare and measure drugs for patient use. Definitions of general terminology associated with drug use and the procedures for the care and handling of drugs and solutions will follow.

The classifications of drugs, the principles of drug use in the care of surgical patients, and a detailed discussion of anesthesia, including the preoperative drugs, intraoperative anesthetic agents, and complications of anesthesia, will conclude the semester. Prerequisites: BIOL 221 and 221L, SRGT 110, 120 and 130.

SRGT 240 Specialty Surgical Procedures Fall 5 credits

This course will cover surgical procedures in all surgical specialty areas. Included will be discussion of the preoperative diagnosis and types of incisions and wound closure. The surgical specialties of general and rectal surgery, peripheral vascular surgery, obstetric and gynecologic surgery, and genitourinary surgery will begin the semester. These will be followed by the specialties of ear, nose, and throat surgery, head and neck surgery, oral and maxillofacial surgery, plastic and hand surgery, and orthopedic surgery. Neurosurgery and thoracic/cardiac surgery will be the next surgical specialties to be covered. The semester will conclude with trauma surgery, transplant surgery, and organ procurement surgery. General pediatric and geriatric aspects of surgery, and endoscopy will be included in each area of surgical specialty. Prerequisites: BIOL 221 and 221L, SRGT 110, 120 and 130. Corequisite: SRGT 250.

SRGT 250 Surgical Procedures Lab Fall 2 credits

In this class, students will continue to learn about and practice the skills of gowning and gloving, table set-up, and the uses of suture, needles and draping. This lab will cover surgical procedures in all surgical specialty areas. The surgical specialties of general and rectal surgery, obstetric and gynecologic surgery, endoscopic surgery, and genitourinary surgery will begin the semester. These will be followed by ear, nose and throat surgery, head and neck surgery, oral and maxillofacial surgery, and ophthalmic surgery. Orthopedic surgery, neurosurgery, plastic surgery, and hand surgery will be the next surgical specialties to be covered. The semester will conclude with a review of thoracic and cardiac surgery, peripheral vascular surgery, trauma surgery, transplant surgery, and organ procurement surgery. General pediatric and geriatric aspects of surgery will be included in each area of surgical specialty. Prerequisites: BIOL 221 and 221L, SRGT 110, 120 and 130. Corequisite: SRGT 240.

SRGT 260 Professional Skills for the Surgical Technologist Fall 3 credits

This course will cover the patient's response to illness and hospitalization including the physical, spiritual, and psychological needs of the patient, and the patient's bill of rights. Advanced patient care skills of vital signs, managing emergency situations, and documentation will follow. The semester will continue with personal relations, professional relations, and legal aspects including consent for surgery, ethical and moral responsibilities of the surgical technologist. A discussion of health agencies, accrediting agencies, and job-seeking skills will conclude the semester. Prerequisites: BIOL 221 and 221L, SRGT 110, 120 and 130.

SRGT 280 Operating Room Clinical Internship Spring 12 credits

SRGT 280 will allow students to practice the skills, critical thinking, and professional behaviors that comprise competent entry-level surgical technology practice. This experience will take place in a patient care setting. The student performance will include 2nd and 1st scrubbing on minor and major cases, doing counts, basic setups, holding retractors, passing instruments, and in general, assisting operating room personnel. The students will also perform circulating duties, including pre-operative, intra-operative, and post-operative care, allowing the student to function in the role of a supervised circulating surgical technologist. Prerequisites: All other SRGT courses.

SUSTAINABLE CONSTRUCTION TECHNOLOGY (CARP, BCT, CMT, ARCT)

ARCHITECTURAL DRAFTING AND ESTIMATING (ARCT)

ARCT 144 Construction Estimating Fall 3 credits

This course is an introduction to residential material estimating. Techniques, formulas and tools to develop complete and accurate construction estimates will be studied.

CONSTRUCTION MANAGEMENT TECHNOLOGY (CMT)

CMT 252 Project Management Fall 3 credits

Prerequisite: BCT 216 and BCT 218. This course is designed to provide study in construction project management. Students will study, develop and apply work place interpersonal skills, construction documentation, trades and resource scheduling and control and construction planning.

CMT 253 Construction Scheduling Spring 3 credits

Prerequisite CMT 252. This course is design to give an overview of construction scheduling. Emphasis will be placed on coordinating plans, specifications, construction materials, employees, subcontractors, equipment and evaluating if resources and schedules are being utilized in an efficient and profitable process.

BUILDING CONSTRUCTION TECHNOLOGY (BCT)

BCT 216 Sustainable Building I Spring 3 credits

This course introduces and defines sustainable/green building. Energy efficiency and conservation will be studied as a system considering materials production, site selection and design, building construction, owning and maintaining a sustainable/green home, impact on the natural environmental by the built environment, and the end of life cycle and deconstruction of buildings. Emphasis will be placed on preparing students for Sustainable Building II in which students will design a sustainable/green-built home and study the construction process and contracting of the home.

BCT 218 Sustainable Building Science II Spring 3 credits

Prerequisite: BCT 216. This course is a study of how the systems of a house are combined to form a sustainable/green built whole house system. Emphasis will be placed on the sequence of construction and the functioning interrelationship of the systems. Students will be required to design a home based on the concepts studied in BCT 216 and 218.

BCT 222 Construction Safety Spring 3 credits

This course is designed to parallel the 29CFR1926 OSHA Construction Industry Regulations and to conform to the National Center for Construction Education and Research (NCCER). The course covers both the compliance as well as best practices in the construction industry as they pertain to safety.

BCT 260 Residential Building Codes Spring 3 credits

This course is a study of residential building codes. Students will learn specific codes, effective use of code books, and the importance of building codes on the home building industry.

BCT 264 Residential Energy Rating Systems Spring 3 credits

This course covers how energy is used, conserved, and measured in a residential structure. National home energy rating and certification systems will be studied including LEED, Energy Star, and National Green Building Standard systems.

BCT 276 House Systems Spring 3 credits

Prerequisite: CARP 110 or BCT 216. This course is designed to give an overview of integrated residential home systems. Introductory study in the areas of mechanical and electrical systems will be provided. The study will be designed for students with little or no experience in the mechanical or electrical trades.

CARPENTRY (CARP)

CARP 110 Blueprint Reading Fall 2 credits

Designed to provide the basic understanding of standard residential blueprints including plot plans, foundation plans, floor plans, elevations, details of mechanical and electrical plans, and a basic understanding of residential building codes.

CARP 112 Introduction to the Green Environment Fall 3 credits

This course is designed to introduce students to an understanding of the green mind-set. Discussions will cover the impact of building on the green environment within the context of market realities.

ENERGY TECHNOLOGY (ENRT)

ENRT 101 Introduction to Energy Technology 4 credits

An introduction to the expanding industry known as "Energy." Students will learn about a variety of energy facilities from traditional to renewable, including but not limited to fossil fuel power plants, petroleum refineries, ethanol and biodiesel facilities, gasification plants, wind farms, geothermal and hydro power production facilities, natural gas processing facilities, petroleum production, water and wastewater treatment and others. The role of the technician in these facilities will be a focus, as will be the expectations and culture of the industry.

THEATRE ARTS (THEA, ENGL, COMM)

COMM 211 Oral Interpretation Fall 3 credits

The techniques of expression as applied to oral reading are studied and practiced. Students are encouraged to use all types of literature to secure an understanding of the intellectual and emotional content of the literature and to communicate this meaning to the listener.

COMM 222 Voice and Diction Spring 3 credits

Studies and exercises designed to develop the "career voice." For students going into fields where the quality of public vocal presentation is important.

ENGL 221 Introduction to Drama Spring 3 Credits

A survey of the world's greatest dramatic literature from Greek times to present. The history of playhouses and stagecraft and other related arts of the theatre are observed in connection with the study of world masterpieces. Prerequisite: English 110 or permission of instructor.

THEA 110 Introduction to Theatre Arts Fall 3 credits

Basic orientation and historical perspective to theatre arts. Study of the roles of playwright, director, actor, designer, producer and audience members in current theatre practice. Course will include attendance at area performances.

THEA 161 Acting I Fall 3 credits

This class focuses on the fundamental techniques and skills of acting. Improvisation exercises, activities and games are used to develop self-awareness, observation, concentration, emotional availability, and vocal and physical interpretive skills. The class lays a strong foundation for performance training but also helps students develop interpersonal communication skills.

THEA 167 Dance-Theatre Movement I BD 3 credits

This course will explore dance through the practice of its elements, dynamics and expression, incorporating ordinary gesture and movements and using abstract space to achieve a synthesis of dance and theatre. Repeatable.

THEA 201 Theatre Practicum F&S 1 credit

Repeatable up to four semester hours. Open to students who are selected for an important role in a college play or for an important duty on the production staff.

THEA 226 Introduction to Design Spring 3 credits

Introduces the student to the principles and elements of design, the design process, and the methods of presentation of design ideas.

THEA 247 Stage Makeup BD 3 credits

This course covers the basic principles of design and how they apply to the creation of makeup designs. Students become acquainted with the basic tools and materials of stage makeup. Different techniques of applying makeup to create effective illusions for the stage will be studied.

THEA 255 One-Act Play Production Spring 1-3 credits

This class provides students with hands-on experience in directing and play production. Enrollment is limited. Pre-requisite: permission of instructor; over-ride required for registration. Repeatable.

THEA 261 Acting II Spring 3 credits

This course will provide practical application of basic acting skills to textual material. In a workshop format, students will analyze, rehearse, and perform monologues and scenes from contemporary American dramatic literature. Prerequisite: Acting I or permission of instructor.

THEA 267 Dance-Theatre Movement II BD 3 credits

Practical application of the dynamics of motion though manipulation of dance elements and effort to create meaning through movement. Repeatable.

THEA 270 Stagecraft BD 3 credits

An introduction to the organization and operation of a theatre plant; the construction, crafting and finishing of stage scenery; and the principles of stage lighting.

THEA 294 Independent Study 1-3 credits

Independent or directed study of special topics in theatre. Department chairperson approval is required.

THEA 299 Special Topics in Theatre BD 1-3 credits

Repeatable up to twelve semester hours. Study of special topics in theatre including lighting design, scene painting, and stage management.

THEA 195-295 Service Learning 1-3 credits

Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

THEA 197-297 Cooperative Education/Internship
F&S SM 1-3 credit hours each

Repeatable up to a maximum of six hours. Work hours are arranged by employer, advisor and student. Progress is checked by oral and written reports from the employer. Periodic student-advisor conferences are required to discuss progress or problems. Students are required to submit an accounting of their experiences to their instructor. All co-op experiences are based on a satisfactory/unsatisfactory basis. Department chair approval is required.

VETERINARY SCIENCE (VETS)

SEE AGRICULTURE

WELDING (WELD)

WELD 110 Oxyfuel Operations Spring 2 credits

This course provides the training to develop the manual skills necessary to produce high quality welds using the oxyacetylene welding, brazing, and cutting process on mild steel.

WELD 118 Testing OA in Welding, Brazing, Cutting
Spring 2 credits

This course provides the lab to develop the manual skills necessary to produce high quality welding using the oxyacetylene welding, brazing, and cutting processes on mild steel.

WELD 130 Advanced Testing in OA Welding, Brazing, Cutting Spring 2 credits

This course provides the advanced lab to develop the manual skills necessary to produce high quality welding using the oxyacetylene welding, brazing, and cutting processes on mild steel.

WELD 135 Welding Principles Spring 2 credits

This course provides the training to develop the manual skills necessary to produce high quality welds on mild steel plate using the gas metal and flux cored arc welding process in all positions.

WELD 140 Methods in GMA & FCA Welding
Spring 2 credits

This course provides the lab to develop the manual skills necessary to produce high quality welds on mild steel plate using the gas metal and flux cored arc welding process in all positions.

WELD 145 Advanced Methods in GMA & FCA Welding
Spring 2 credits

This course provides the advanced lab to develop the manual skills necessary to produce high quality welds on mild steel plate using the gas metal and flux cored arc welding process in all positions.

WELD 150 Methods in GTA & PA Welding
Spring 2 credits

This course provides the training to develop the manual skills necessary to produce high quality welds using the gas tungsten and plasma arc cutting process on mild steel plate in all positions.

WELD 155 Blueprint Reading for Welders
F&S 3 credits

This program concentrates on the understanding and use of technical blueprints. This includes basic lines, geometric construction, orthographic projection, isometric projection, oblique projection, pictorial drawings, and structural sizes.

WELD 160 Advanced Methods in GTA & PA Welding
Spring 2 credits

This lab provides the advanced technical training to develop manual skills necessary to produce high quality welds on mild steel plate using the gas tungsten process in all positions according to the American Welding Society Standards and the plasma cutting process.

WELD 165 Blueprint Symbols for Welding
F&S 3 credits

This course is a continuation of WELD 155, and introduces the American Welding Society standardized welding symbols used on blueprints. Actual prints from industry are used during this course. Prerequisite: Welding 155.

WELD 170 Arc Welding Operations Fall 2 credits

This course provides the training to develop the manual skills necessary to produce high quality welds using the shielded metal arc welding process in all positions, on thin and medium thickness mild steel, using single and multi pass welds with the E60 series electrodes.

WELD 173 Methods in Arc Welding Operations
Fall 4 credits

This course provides the training to develop the testing skills necessary to produce high quality welds on mild steel plate in all positions using the shielded metal arc welding process according to the American Welding Society Standards.

WELD 180 Shielded Metal Arc Welding
Fall 2 credits

This course provides the training to develop the manual skills necessary to produce high quality welds using the shielded metal arc welding process on thin and medium thickness mild steel plates in all positions using the E70 series electrodes.

WELD 183 Testing in Shielded Metal Arc Welding
Fall 4 credits

This course provides the training to develop the testing skills necessary to produce high quality welds using the shielded metal arc welding process on mild steel plate in all positions with E70 series electrodes according to the American Welding Society Standards.

WELD 187 Types of Non-Destructive Testing
Fall 3 credits

This course studies non-destructive tests such as: magnetic particle, eddy current, visual, ultrasonic, dye penetrant, and radiographic.

WELD 210 Gas Tungsten Arc Pipe Welding
Fall 3 credits

This course provides the training to develop the manual skills necessary to produce high quality groove welds on four-inch diameter schedule 40 steel pipe in the 2G, 5G, and 6G positions. Department approval required.

WELD 215 Testing in Gas Tungsten Arc Pipe Welding
Fall 3 credits

This course provides the training to develop the manual skills necessary to produce high quality groove welds on pipe in the 2G, 5G, and 6G positions using the gas tungsten arc welding process. All testing is in accordance with the American Society of Mechanical Engineer Standards. Department approval required.

WELD 220 Shielded Metal Arc Pipe Welding
Fall 3 credits

This course provides the necessary training to make high quality groove welds on open root mild steel pipe in the 2G, 5G, and 6G positions using the shielded metal arc open root process. Department approval required.

WELD 225 Testing in Shielded Metal Arc Pipe Welding
Fall 3 credits

This course provides the training to develop the testing skills necessary to produce high quality groove welds on pipe in the 2G, 5G, and 6G positions using the American Society Mechanical Engineer Standards. Department approval required.

WELD 230 Gas Metal Arc Pipe Welding
Fall 3 credits

This course provides the training to develop the manual skills necessary to produce high quality groove welds on 6-inch diameter schedule 40 steel pipe in the 2G, 5G, and 6G positions using the gas metal arc process. Department approval required.

WELD 235 Testing in Gas Metal Arc Pipe Welding
Fall 3 credits

This course provides the training to develop the testing skills necessary to produce high quality groove welds on pipe in the 2G, 5G, and 6G positions using the gas metal arc welding process. All testing is in accordance with the American Society of Mechanical Engineer Standards. Department approval required.

WELD 240 Special Projects Fall 3 credits
To design and/or build a special project concentrating on the students major area of interest in the field of welding. This project will allow the student to integrate all the theoretical and hands-on skills acquired in the program. Department approval required.

WELD 245 Special Projects Fall 3 credits
A continuation of W240, Special Projects 1, for advanced design and development of projects concentrating on the student's major area of interest in the field of welding, allowing the student to integrate all the theoretical and hands-on skills acquired in the program. Department approval required.

WELD 294 Independent Study 1-3 credits
Independent or directed study of special topics in welding. Department chairperson approval is required.

WELD 299 Special Topics 1-3 credits
Variable topics in the field of welding technology. Repeatable as long as content varies. Consent of department chairperson.

WELD 195-295 Service Learning 1-3 credits
Maximum of six semester hours. Service learning may be accomplished by one of three methods: Joining a club that has a public service component, doing volunteer work at a non-profit organization, or taking a course that links public service with its curriculum.

WELD 197-297 Cooperative Education/Internship
1-3 credit hours each

Repeatable up to a maximum of six hours. Students get on-the-job experience under qualified supervision in welding occupations. Work hours are arranged by employer, advisor, and student. Student progress is checked by oral and written reports from the employer. Student advisor conferences are held to discuss progress and/or problems. All co-op experiences are based on a satisfactory/unsatisfactory basis. Consent of department chairperson.