Commentary: A first-year sequence consists of 101 & 102 courses (5 credits each) for all MCLL majors except Irish; 101, 102, & 103 courses of Irish (3 credits each) must be completed. Students may take placement test to demonstrate proficiency to receive non-credit exemption from this requirement. Speak with your advisor for more information.
Other Courses
Category Name: AA Degree Electives
Rule: Number of elective credits required varies; student needs to ensure s/he earns at least 60 total credits for the AA degree. Criterion: Number of Credits 13-27
Course Listing
Commentary: Transfer students may count up to 30 transfer credits towards the total 60 necessary for degree. A maximum of 15 technical credits may be counted towards the total 60. (A student may use 20 technical credits towards the 60 if s/he has earned an AAS degree.)
Commentary: Degree Commentary
The AA degree has three requirements: completion of UM's lower-division General Education Requirements (GERs), a minimum of 60 total earned credits, and a
minimum cumulative GPA of 2.0. At least 30 of the total 60 degree credits must be earned from Missoula College or UM-Missoula. Missoula College students are limited to enrolling in lower-division coursework (course level 100 or 200).
Up to 15 technical credits may be counted towards the total 60 required for the AA. If the student has previously earned an AAS degree, the student may use up to 20 technical credits.

Course Descriptions

Applied Arts and Sciences

AASC 100 - Intro to University Experience
Credits: 3. This course is designed to help new students make a successful transition to college and acquire the skills needed to become competent and successful in higher education. Topics include an introduction to campus resources and academic policies; motivation and time management; study skills and learning strategies; critical thinking and problem solving; ethics, diversity and collaboration; information literacy and research. The course culminates with a semester capstone project. Elective credit only. Credit not allowed for both AASC 100 and AASC 101.
AASC 101 - Study & Learning Strategy
Credits: 2. This course facilitates the development of skills needed to become competent and successful in higher education. Topics include management of classroom performance, time, and money; memory, listening and note-taking; reading and test-taking strategies; critical thinking and problem-solving; information literacy and research; ethics and diversity; stress management and healthy choices. Elective credit only. Credit not allowed for both AASC 100 and AASC 101. Course Attributes: Study Skills Course
AASC 195T - Special Topics
Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Course Attributes: Technical Course
AASC 196T - Independent Study

Credits: 1 TO 6. (R-6) Offered intermittently. Course material appropriate to the needs and objectives of the individual student. Course Attributes: Technical Course

AASC 295T - Special Topics

Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Course Attributes: Technical Course

Art

ARTZ 195 - Student Teaching

Credits: 1 TO 6. (R-6) Offered intermittently. Organized student teaching.

Biology-General

BIOB 295 - Student Teaching

Credits: 1 TO 6. (R-6) Offered intermittently. Organized student teaching.

Biology-Human

BIOH 108 - Basic Anatomy

Credits: 3. Offered Intermittently. Structures of the human body and their basic functions.

BIOH 201N - Human Anat Phys I (equiv 301)

Credits: 4. Offered autumn and spring. Prereq., introductory science course or college-prep high school biology course recommended. Comprehensive knowledge of human form and function necessary for students preparing for health-related professions. Emphasis on structure, function and homeostatic regulation of body systems with presentation of basic concepts in chemistry and microbiology as they relate to human anatomy and physiology. Covers tissues through nervous system. Required, integrated laboratory includes some dissection. Course Attributes: Natural Science Lab Course Practical Nursing Prog Rqrmnt Registered Nursing Prog Rqrmnt Natural Science Course

BIOH 202N - Human Anat and Phys I Lab

Credits: 4. Offered autumn and spring. Coreq., BIOH 201. Basic knowledge necessary for students in health-related programs. Emphasis on normal anatomy and physiology with presentation of basic concepts in chemistry and microbiology as they relate to human anatomy and physiology. Covers tissues through nervous system. A cadaver lab is included. Course Attributes: Natural Science Lab Course Practical Nursing Prog Rqrmnt Registered Nursing Prog Rqrmnt Natural Science Course

BIOH 211N - Human Anat Phys II (equiv 311)

Credits: 4. Offered autumn and spring. Prereq., and continuation of BIOH 201N. Comprehensive knowledge of human form and function necessary for students in health-related programs. Emphasis on structure function and homeostatic regulation of body systems with presentation of basic concepts in chemistry and microbiology as they relate to human anatomy and physiology. Covers endocrine through reproductive systems. Required integrated laboratory includes frequent dissection. Course Attributes: Natural Science Lab Course Practical Nursing Prog Rqrmnt Registered Nursing Prog Rqrmnt Natural Science Course

BIOH 212N - Human Anat Phys II Lab

Credits: 4. Offered autumn and spring. Prereq., BIOH 201N. Coreq., BIOH 211. Continuation of 201N. Basic knowledge necessary for students in health-related programs. Emphasis on normal anatomy and physiology with presentation of basic concepts in chemistry and microbiology as they relate to human anatomy and physiology.

Covers endocrine through reproductive systems. A cadaver lab is included. Course Attributes: Natural Science Lab Course Practical Nursing Prog Rqrmnt Registered Nursing Prog Rqrmnt Natural Science Course

BIOH 213N - The Biology of Behavior

Credits: 3. Offered autumn and spring. Prereq., SCN 100N. An introduction to the biological basis of human behavior, including neuron function and the roles of hormones, heredity, and environmental influences. Behavioral topics include sensation, learning, emotion, and issues such as obesity, addiction, and stress. Intended for students to satisfy the science with a lab general education requirement. Course Attributes: Natural Science Lab Course

BIOH 220 - Human Physiology

Credits: 4. Offered intermittently. Prereq., BIOH 201N, 202N, 211N, and 212N. In-depth exploration of principles and clinical consequences of the physiology of selected human organ systems. Building upon basic concepts covered in BIOH 201N, 202N, 211N, and 212N, students study membrane functions, neural physiology, endocrine and peripheral nervous system function and coordination, circulatory, respiratory, renal, and digestive physiology.

BIOH 261 - Human Physiology lab

Credits: 4. Offered autumn. Prereq., BIOH 201N, 202N, 211N, and 212N. In-depth exploration of principles and clinical consequences of the physiology of selected human organ systems. Building upon basic concepts covered in BIOH 201N, 202N, 211N, and 212N, students study membrane functions, neural physiology, nervous system integration, endocrine and peripheral nervous system function and coordination, circulatory, respiratory, renal, digestive, and reproductive physiology.

BIOH 295 - Student Teaching

Credits: 1 TO 6. (R-6) Offered intermittently. Organized student teaching.

Chemical Addiction Studies

CAS 140X - Addictions and Diversity

Credits: 3. Offered autumn and spring; summers intermittently. This course required for students seeking to obtain their AA degree in Chemical and Addiction Studies and who wish to become Licensed Addiction Counselors in the State of Montana. Introduction to multicultural competencies where students will be exposed to the fundamentals of working with substance abusing and dependent individuals from the cultural impact of race, nationality, gender, age, sexual orientation, religion, and socio-economic status on the development and progression of alcohol/drug problems. Appropriate for students of Social Work, Psychology, community health, Business and Counseling students, Education, and those with an interest in diversity and addictions. Course Attributes: Indigenous and Global

CAS 185 - Prevention Practices

Credits: 3. Offered autumn and spring and summers intermittently. This course required for students seeking to obtain their AA degree in Chemical and Addiction Studies and who wish to become Licensed Addiction Counselors in the State of Montana. The course introduces strategies for environmental prevention that focus on altering and improving the environment by changing social norms or attitudes, controlling the availability of illicit drugs or alcohol, or strengthening enforcement of laws and regulations. Risk and Protective Theory will be outlined, as well as the five categories of environmental strategies. This course is appropriate for everyone who has or will have a role in prevention, education, community health, and/or community change. Required for Chemical Addiction Studies students. May also be appropriate for students of social work, psychology, sociology, community health or those with an interest in learning about alcohol and drug prevention in society.

CAS 191 - Special Topics

Credits: 3. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

CAS 195 - Field Work/Clinical/Practicum

Credits: 1 TO 3. (R-3) Offered every autumn and spring. This field work placement focuses on PREVENTION and is created to provide Chemical Addiction Studies students with direct experience working in community organizations where they will create and implement alcohol and drug prevention activities. May also be appropriate for students of Social Work, Psychology, Sociology, Community Health or those with an interest in learning about prevention practices with direct experience in community organizations. Prerequisite: CAS 185 Prevention Practices and CAS 243, Fundamentals of Substance Abuse C/I. Course Attributes: Internships/Practicums

CAS 210 - Individual Counseling

Credits: 3. Offered intermittently. Prereq., CAS 201; CAS 242; PSYX 240. This course is intended for students seeking to obtain their AA degree in Chemical and Addiction Studies and who wish to become Licensed Addiction Counselors in the State of Montana. Major theories and practice of individual counseling for the client with substance abusing or chemically dependent individual is presented.

CAS 225 - Group Counseling

Credits: 3. Offered Intermittently. Prereq., CAS 201, CAS 242, PSYX 240. This course is intended for students seeking to obtain their AA degree in Chemical and Addiction Studies and who wish to become Licensed Addiction Counselors in the State of Montana. Major theories and practice of counseling for the client with substance abusing or chemically dependent individual in group settings. Includes comprehensive group approaches, family therapy and other appropriate group strategies. Includes group dynamics and strategies to managing group sessions.

CAS 231 - Pharmacology/Addictions

Credits: 3. Offered intermittently. This course is offered for students seeking to obtain their AA degree in Chemical and Addiction Studies and who wish to become Licensed Addiction Counselors in the State of Montana. May also be appropriate for Students of Social Work, Psychology, Sociology, Community Health or those with an interest in learning about pharmacology and addictions. This course discusses the classes of drugs, their effects on behavior and the effects on society in general. Primary emphasis is on the effects of the chemicals on the brain function of the individual.

CAS 242 - Fund Subst Abuse and Addiction

Credits: 3. This course is offered for students seeking to obtain their AA degree in Chemical and Addiction Studies and who wish to become Licensed Addiction Counselors in the State of Montana. May also be appropriate for Students of Social Work, Psychology, Sociology, or Community Health.

CAS 243 - Substance Abuse Counseling I

Credits: 3. Offered autumn and spring and summers intermittently. Prereq., CAS 242, CoReq. CAS 201, PSYX 240, or Abnormal Psychology, and consent of instr. This course is required for students seeking to obtain their AA degree in Chemical and Addiction Studies and who wish to become Licensed Addiction Counselors in the State of Montana. This course is created to provide students specific knowledge regarding the theories, research, and evidenced-based literature in the provision of addiction counseling services. Students will be introduced to the overall scope of the problems of addictions, professional characteristics and principles of addiction counselors, ethical and legal responsibilities of professional behavior, addiction counseling skills and competencies required to be addiction counselors.

CAS 248 - Substance Abuse Counseling II

Credits: 3. Offered autumn and spring and summers intermittently. Prereq., PSYX 240, CAS 201, CAS 242, consent of instr., corereq., CAS 243. This course is required for students seeking to obtain their AA degree in Chemical and

Addiction Studies and who wish to become Licensed Addiction Counselors in the State of Montana. Meets specific State of Montana educational requirements associated with individual and group counseling for addiction, as well as ethics for addiction counselors. The course requires the student to draw upon the resources provided by experts. The course work significant amount of experiential application and counseling practice techniques.

CAS 260 - Addiction Assess/Documentation

Credits: 3. Offered autumn and spring and summers intermittently. Prereq./CoReq., CAS 243, CAS 248, and consent of instr. This course is required for students seeking to obtain their AA degree in Chemical and Addiction Studies and who wish to become Licensed Addiction Counselors in the State of Montana. Intended to provide a comprehensive education to meet State of Montana education requirements for Licensure in Addiction Counseling. Students will be trained in clinical assessment diagnosis, treatment planning and patient record documentation with the client who has substance use disorders. Students will complete experiential application of the materials.

CAS 291 - Special Topics

Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

CAS 292 - Independent Study

Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

CAS 295 - Field Work/Clinical/Practicum

Credits: 1 TO 4. (R-4) This course is offered for students seeking to obtain their AA degree in Chemical and Addiction Studies and who wish to become Licensed Addiction Counselors in the State of Montana. This Field Work Placement focuses on addiction treatment and counseling activities. The student will work in the community under the supervision of an addiction treatment professional and be given the opportunity to witness and participate in alcohol and drug treatment counseling activities. Prerequisites: Consent of Instructor and successful completion of all other CAS courses. Course Attributes: Internships/Practicums

Chemistry

CHMY 195 - Student Teaching

Credits: 1 TO 6. (R-6) Offered intermittently. Organized student teaching.

Communication

COMX 102 - Interprsnl Skills in Workplace

Credits: 1. This course will introduce students to interpersonal communication theory which can be applied to a workplace environment. Students will learn effective communication strategies that promote success in professional and personal relationships.

COMX 140L - Intro to Visual Rhetoric

Credits: 3. Offered autumn and spring. An introduction to the persuasive nature of visual symbols as texts. Readings will include historical to contemporary rhetorical criticisms on advertising, billboards, bodies, cartoons, memorials, and photography. Course Attributes: Literary & Artistic Stds Crse

COMX 191 - Special Topics

Credits: 1 TO 9. (R-9) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

COMX 192 - Independent Study

Credits: 1 TO 6. (R-6) Offered intermittently. Course material appropriate to the needs and objectives of the individual student.

COMX 198 - Internship

Credits: 1 TO 6. (R-6) Offered autumn and spring. Prerequisite, consent of instructor. Extended classroom experience that provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (398, 498) may count toward graduation.

COMX 212X - Intro to Intercultural Com

Credits: 3. Offered autumn and spring. This course provides students with an introduction to communicating across cultures. Local and global case studies and theories will be explored. Students will explore the influence of immediate communication and social media on large scale social issues. Course Attributes: Indigenous and Global

COMX 217A - Oral Interpretation of Lit

Credits: 3. Offered intermittently. Introduction to orally presenting literature to an audience. Focus is on analyzing and performing prose, drama, poetry, and children’s literature to express point of view. Course Attributes: Expressive Arts Course

COMX 219S - Survey of Children's Comm

Credits: 3. Offered autumn. Focus on communication processes and contemporary communication environments of children and adolescents. Topics include language development and the brain, nonverbal communication development, media, contracting, bullying, and gender. Course Attributes: Social Sciences Course

COMX 291 - Special Topics

Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

COMX 292 - Independent Study

Credits: 1 TO 6. (R-6) Offered intermittently. Course material appropriate to the needs and objectives of the individual student.

Creative Writing

CRWR 210A - Intro Fiction Workshop

Credits: 3. Offered intermittently. This beginning writing workshop emphasizes the reading, discussion, and revision of students' short fiction. Students will be introduced to the technical elements of writing fiction. No prior experience in writing short fiction required. Course Attributes: Expressive Arts Course

CRWR 211A - Intro Poetry Workshop

Credits: 3. Offered intermittently. This beginning writing workshop focuses on the reading, discussion, and revision of students' poems. Students will study and use models of poetic techniques. No prior experience in writing poetry required. Course Attributes: Expressive Arts Course

CRWR 240A - Intro Creative Writing Wrkshp

Credits: 3. Offered every term. Beginning writing workshop designed for students to explore genres of creative writing with opportunities for students to write, and revise using genre-specific writing techniques. Course Attributes: Expressive Arts Course

Environmental Studies

ENST 231H - Nature and Society
Credits: 3. Offered intermittently, autumn and spring. Prereq., WRIT 101. Explores the relationship between ideas about nature and the development of political and social ideas, institutions, and practices in primarily western (Euro-American) society. Course is an elective for students in the 2-uear AA and AAS degree programs. Course Attributes: Historical & Cultural Course Writing Course-Intermediate
Mathematics

M 065 - Prealgebra
Credits: 3. Offered every term. Prereq., ALEKS placement >= 1. Arithmetic and basic algebra skills needed for Introductory Algebra. Topics include integers and rational numbers, decimals and percentages with applications, ratios and proportions with applications, single variable linear equations with applications, introduction to graphing, exponents, factoring, and an introduction to polynomials. Credit does not count toward a certificate or degree. Credit does not count toward Associate of Arts, Associate of Applied Science, or Baccalaureate degrees. MC Course Attributes: Technical Course
M 090 - Introductory Algebra
Credits: 3. Offered every term. Prereq., M 065 or ALEKS placement >= 2. Review of arithmetic principles of integers and rational numbers, linear equations in one or two unknowns, systems of linear equations and operations with polynomials and rational expressions. Credit does not count toward an Associate of Arts, Associate of Applied Science, or Baccalaureate degree. MC
M 095 - Intermediate Algebra
Credits: 3. Offered autumn and spring. Prereq., M 090 or ALEKS placement >= 3. Topics include linear equations, inequalities, applications and graphing; polynomials; radicals, rational exponents and complex numbers; quadratic equations. Graphing calculator required. Credit does not count toward Associate of Arts or Baccalaureate degrees. MC
M 111 - Technical Mathematics
Credits: 3. Offered autumn and spring. Prereq., ALEKS placement >= 2. Designed to provide the mathematical background necessary for success in the industrial areas. Topics covered include percent, ratio proportion, formula evaluation, basic algebra and geometry concepts, trigonometry, measurement, statistics, and graphing. Markdowns, inventory turnover, and other basic formulas. Credit does not count toward Associate of Arts or Baccalaureate degrees. MC Course Attributes: Technical Course

Psychology

PSYX 161S - Fund of Organizational Psych
Credits: 3. Offered intermittently. Foundation in the psychological processes that influence behavior of people in organizational settings. Course Attributes: Social Sciences Course
PSYX 230 - Developmental Psychology
Credits: 3. Offered autumn, Spring, Summer. Prereq., PSYX 100S. The study of human physical, cognitive and psychosocial development throughout the life span. Content covers major theories, the influence of genetics, and the environment from a chronological aspect. Appropriate for Social work, Nursing, Addiction Studies, Education, and Psychology.
PSYX 238 - Adolescent Psychology

Credits: 3. Offered every term. PreReq., PSYX 100S or PSYX 230S. This course is designed to provide an introduction to the physical, social, emotional, and cognitive developmental changes that occur during adolescence, as well as their relationships and cultural influences. Appropriate for students in Addiction Studies, Psychology, Social Work, Education, and other disciplines where a study of the adolescent is desired.

PSYX 240 - Fund of Abnormal Psychology

Credits: 3. Offered every term. Prereq., PSYX 100. This course provides a broad introduction to abnormal psychology, which includes defining abnormality, examining the history of abnormal psychology, identifying how abnormal psychology relates to other disciplines in psychology, exploring major research methods used in abnormal psychology, discussing various mental illnesses and their potential causes and possible treatments, and applying major abnormal psychological findings to practical problems.

Science (COT)

SCN 095T - Special Topics

Credits: 1 TO 6. Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

SCN 100N - Issues in Biology

Credits: 3. Offered autumn and spring. An introductory course for students with little science background. This course explores several issues relating to human biology such as cancer, drug abuse, population growth, and genetic engineering. Also includes discussions of fundamental biological concepts such as evolution, biodiversity, and basic cell and molecular biology. Course Attributes: Natural Science Course

SCN 105N - Montana Ecosystems

Credits: 3. Offered autumn and spring. An introduction to the landscapes and ecosystem diversity of Montana, with an emphasis on exploring the dominant habitats of western Montana. Required, integrated laboratory includes field trip investigations, classroom lab exercises, and presentations. Course Attributes: Natural Science Lab Course

SCN 120T - Technical Physics I

Credits: 4. Offered intermittently. Prereq., M 095. Introduction to models, measurements, vectors, motion in a straight line, motion in a plane, Newton's laws of motion, application of Newton's laws, and circular motion and gravitation. Course Attributes: Technical Course

SCN 175N - Integrated Physical Science I

Credits: 3. Offered every term. An introduction to the basic principles of physics, chemistry, and nuclear reactions with emphasis on the scientific method and process. A knowledge of basic algebraic functions, decimals, and scientific notation is recommended. Suitable for students with little science background. Course Attributes: Natural Science Course

SCN 176N - Integrated Phys. Science II

Credits: 3. Offered spring term. An introduction to the fundamental principles of environmental and earth sciences. Course emphasizes the scientific method and process of science. Course Attributes: Natural Science Lab Course Natural Science Course

SCN 195T - Special Topics

Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Course Attributes: Technical Course

SCN 196T - Independent Study

Credits: 1 TO 6. (R-6) Offered intermittently. Course material appropriate to the needs and objectives of the individual student. Course Attributes: Technical Course

SCN 260N - The Biology of Behavior

Credits: 3. Offered autumn and spring. Prereq., SCN 100N. An introduction to the biological basis of human behavior, including neuron function and the roles of hormones, heredity, and environmental influences. Behavioral topics include sensation, learning, emotion, and issues such as obesity, addiction, and stress. Intended for students to satisfy the science with a lab general education requirement. Course Attributes: Natural Science Lab Course

SCN 291 - Student Teaching

Credits: 1 TO 6. (R-6) Offered intermittently. Organized student teaching.

SCN 295T - Special Topics

Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Course Attributes: Technical Course

Writing

WRIT 090T - Critical Writing Skills

Credits: 3. Offered intermittently. Prereq., placement or referral by WRIT 101 instructor. Designed for students who need instruction and practice integrating critical thinking, reading, and writing before entering the required first-year writing course. Emphasis on drafting and revising. Grading by traditional letter system or NCR (no credit). Traditional letter grade only. Credit does not count toward a certificate or degree. Course Attributes: Technical Course

WRIT 095 - Developmental Writing

Credits: 3. Offered every term. Prereq., placement or referral by WRIT 101 instructor. Designed for students who need instruction and practice integrating critical thinking, reading and writing before entering the required first-year writing course. Emphasis on invention, drafting, and revision. Grading A-F or NC (no credit). Credit does not count toward Associate of Arts or Baccalaureate degrees.

WRIT 121 - Intro to Technical Writing

Credits: 3. Offered every term. Introduction to technical writing situations that integrate text, design, and graphics. Emphasis is on evidence-based, informative writing that uses design and graphics to visually represent logic and organization. Course focuses on writing as a process and includes student self-assessment. Major assignments include a pure technical document, exploration of credibility, and public science writing. Students are expected to write without major faults in grammar or usage and to have basic computer literacy. Course Attributes: Writing Course-Intermediate

WRIT 191T - Special Topics

Credits: 1 TO 9. (R-9) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Course Attributes: Technical Course

WRIT 192 - Independent Study

Credits: 1 TO 6. (R-6) Offered intermittently.

WRIT 221 - Intermediate Tech Writing

Credits: 3. Offered intermittently. Prereq., WRIT 121, WRIT 101, or consent of instr. Continuation of technical writing with emphasis on technical text including editing for technical content, graphic placement, and document design as seen through the eye of the audience. Current critical issues in technical writing are discussed. Course Attributes: Writing Course-Intermediate

WRIT 291T - Special Topics

Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Course Attributes: Technical Course
WRIT 292T - Independent Study
Credits: 1 TO 6. (R-6) Offered intermittently. Course material appropriate to the needs and objectives of the individual student. Course Attributes: Technical Course

Applied Computing and Engineering Technology

Penny Jakes, Chairperson

The Department of Applied Computing and Electronics collaborates with business and industry to prepare graduates to compete in and contribute to a diverse and dynamic global society. Students acquire the practical skills necessary to pursue entry-level careers in STEM-related (Science, Technology, Engineering, and Mathematics) occupations. Students engage in experiential learning, embracing technical education, effective communication, problem solving, professionalism, and specific workplace skills. The department promotes lifelong learning to empower students in an ever-changing world. More details on programs available through the department can be found at: http://ace.mc.umt.edu.

Preparation to Enter Programs

Students entering programs in Applied Computing & Electronics are expected to have basic computing skills and adequate preparation in mathematics. Completion of M90 Introductory Algebra or equivalent placement scores are required for the following first year courses: DDSN 114 (DDSN Intro to CAD), CSCI 110 Programming – VB I, CSCI 113 C++ Programming, CSCI 172 Intro to Computer Modeling, ITS 165 OS Commands and Scripts, ITS 150 CCNA I, NRGY 101 Intro to Sustainable Energy and ETEC 105 DC Circuit Analysis. Underprepared students should allocate an additional semester to the suggested four semester sequence in completing programs of study.

Missoula College Catalog Year: 2015-2016

Degree Type: Certificate of Applied Science Level: Certificate Subject: **Computer Aided Design**
Total Credits: 34 Cumulative GPA Required: 2.0
The Computer Aided Design (CAD) program offers graduates a pathway into professional careers as technicians in civil, mechanical, and architectural drafting. Other career opportunities exist in geographic information systems, mapping, surveying, and technical design. This one-year program prepares students in mathematics, business, and writing, as well as the following skills: graphic communications; computer-aided design and modeling systems; geographic information systems; and surveying. Graduates emerge with an understanding of how to use computer aided design software to solve real-world graphic communications problems in a team-oriented environment.
Lower Division Core
Category Name: Computer Aided Design Core Certificate Courses Rule: All courses are required
Criterion: C-
Course Listing Number of Credits 34

BGEN 105S	Introduction to Business		3	
CSCI 105	Computer Fluency	3	F,S	
CSCI 172	Intro to Computer Modeling		3	F,S
DDSN 113	Technical Drafting	3	F	
DDSN 116	3D CAD	3	F	
DDSN 244	GIS Mapping	3	S	
DDSN 245	Civil Drafting	4	S	
M 121	College Algebra	3		
SRVY 230	Intro to Srvyg for Engineers		3	S
WRIT 101	College Writing I	3		

Commentary: WRIT 121 Technical Writing may be substituted for WRIT 101 at the discretion of the program advisor based on future career and educational goals.

Missoula College Catalog Year: 2015-2016

Degree Type: Certificate of Applied Science Level: Certificate Subject: **Computer Support Specialist**

Total Credits: 31 Cumulative GPA Required: 2.0

Computer Support is a 31-credit certificate program that prepares students for entry-level positions in the computing field. Required coursework includes programming, operating systems, networking, PC hardware, data modeling, and web technologies. Graduates pursue careers as help desk technicians, computer repair professionals, and computer support specialists. All students have the opportunity to complete the CompTIA A+ Computer Support Specialist industry certification. Coursework for the certificate program also leads to the A.A.S. degree in Information Technology.

Category Name: Computer Support Specialist Core Certificate Courses Rule: All courses are required

Criterion: C-

Course Listing Number of Credits 28

BGEN 105S	Introduction to Business		3	
CSCI 105	Computer Fluency	3	F,S	
CSCI 135	Fund of Computer Science I		3	
CSCI 172	Intro to Computer Modeling		3	F,S
ITS 150	CCNA 1: Exploration	3	F,S	
ITS 165	OS Commands and Scripts		3	S
ITS 210	Network OS - Desktop	3	F	
ITS 280	Computer Repair & Maint.		3	F
ITS 289	Professional Certification		1	F,S
WRIT 101	College Writing I	3		

Subcategory Name: Mathematics

Rule: Chose one course from the following or any Mathematics course having one of these as a prerequisite

Criterion: C- Number of Credits 3

Course Listing

M 115	Probability and Linear Math	3	
M 121	College Algebra	3	
M 151	Precalculus	4	

Missoula College Catalog Year: 2015-2016

Degree Type: Associate of Applied Science Level: Major Subject: **Electronics Technology**

Students in the Electronics Technology program learn to troubleshoot, calibrate, test, and repair electronic components and circuit boards used in a wide range of electronic equipment including computers and communication equipment. Training includes working knowledge of direct and alternating current theory, semiconductor circuits, instrumentation, automatic controls, data communications, computerized communication links, and operational amplifiers. Students become familiar with robotics, electronic communications theory, and modes of RF communications.

Students are awarded the Associate of Applied Science degree upon successful completion of the program.

Lower Division Core

Category Name: Electronics Technology core courses Rule: All courses are required

Criterion: C- Number of Credits 66

Course Listing

CSCI 105	Computer Fluency	3
CSCI 113	Programming with C++ I	3
ELCT 237	Intro to Prog Logic Controller	3
ETEC 105	DC Circuit Analysis	4
ETEC 106	AC Circuit Analysis	3
ETEC 113	Circuits Lab	1
ETEC 245	Digital Electronics	4
ETEC 250	Solid State Electronics I	4
ETEC 251	Solid State Electronics II	3
ETEC 260	Data and Network Communication	3
ETEC 265	Control Systems	4
ETEC 270	Wireless Communications	4
ETEC 275	Microprocessors	4
ETEC 299	Electronics Capstone	3
M 121	College Algebra	3
M 122	College Trigonometry	3
M 162	Applied Calculus	4
PSYX 100S	Intro to Psychology	4
SCN 175N	Integrated Physical Science I	3
WRIT 101	College Writing I	3

Commentary: CSCI 113 C++ Programming may be substituted for CSCI 110. WRIT 121 Technical Writing may be substituted for WRIT 101.

Missoula College Catalog Year: 2015-2016

Degree Type: Technical Certificate Level: Certificate Subject: **Energy Auditor**

Total Credits: 18 Cumulative GPA Required: 2.0

Lower Division Core

Category Name: Core Courses

Rule: Must complete all of the following courses:

Criterion: C- Number of Credits 18

Course Listing

BGEN 105S	Introduction to Business	3
ETEC 213	Power Systems Technology	3
M 121	College Algebra	3
NRGY 101	Intro to Sustainable Energy	3
NRGY 195	Practicum	2
NRGY 235	Building Energy Efficiency	4

Missoula College Catalog Year: 2015-2016

Degree Type: Associate of Applied Science Level: Major Subject: **Energy Technology**

Total Credits: 69 Cumulative GPA Required: 2.0

Students in the Energy Technology program are introduced to the full suite of energy sources and technologies. Graduates will be general practitioners that are equipped with skills in design, installation, and maintenance of diverse energy technologies and systems; sales, operations, and management; regulatory compliance; basic electricity and power systems; energy storage and distribution; site assessment; basic energy economics; efficiency and conservation strategies; and project management. Students may enter the program in either autumn or spring term. Further information can be found at http://ace.mc.umt.edu/nrg/.

Lower Division Core

Category Name: Energy Technology Core Requirements Rule: All courses are required

BGEN 105S	Introduction to Business	3	
BGEN 160S	Issues in Sustainability	3	
CSCI 172	Intro to Computer Modeling	3	F,S
ETEC 105	DC Circuit Analysis	4	
ETEC 106	AC Circuit Analysis	3	
ETEC 113	Circuits Lab	1	
ITS 221	Project Management	3	F
M 121	College Algebra	3	
M 122	College Trigonometry	3	
NRGY 101	Intro to Sustainable Energy	3	F,S
NRGY 102	Intro to Sustainable Energy II	3	F,S
NRGY 195	Practicum	2	SU
NRGY 213	Power Systems Technology	3	S
NRGY 214	Energy Storage and Dist.	3	S
NRGY 235	Building Energy Efficiency	3	S
NRGY 298	Internship	2	F,S
SCN 175N	Integrated Physical Science I	3	
WRIT 101	College Writing I	3	

Commentary: WRIT 121 Technical Writing may be substituted for WRIT 101 at the discretion of the program director based on future career and educational goals.

Commentary: Lower Division Core

Category Name: Energy Technology Science Requirements Rule: Take 3 credits

Criterion: C- Number of Credits 3

Course Listing

ENSC 105N Environmental Science 3
SCN 176N Integrated Phys. Science II 3
Commentary: Major Electives
Category Name: Energy Electives Rule: Take 15 credits
Criterion: C- Number of Credits 15
GEO 151 Introduction to Fossil Fuels 3
NRGY 241 Alternative Fuels 3 F
NRGY 242 Solar Thermal & Wind Systems 3 F
NRGY 243 Fundmtl PV Design & Install 3 S
NRGY 244 Bioenergy 3 S
NRGY 245 Fuel Cells 3 S
NRGY 246 Geothermal Energy Technology 3 F
NRGY 250 Energy Finance 3 SU
NRGY 290 Undergraduate Research 1 To 10F,S
NRGY 291 Special Topics 1 To 4 I
NRGY 292 Independent Study 1 To 9 F,S
NRGY 299 Energy Technology Capstone 3 S
Commentary: 3 credits of a general elective may be substituted in place of 3 credits of energy electives. This substitution must be approved by the program director.

Missoula College Catalog Year: 2015-2016

Degree Type: Certificate of Applied Science Level: Certificate Subject: **Energy Technology**
Total Credits: 30 Cumulative GPA Required: 2.0
The Energy Technology program offers a 30-credit certificate preparing students for entry-level positions in the energy technology field. Required coursework includes mathematics; writing; energy technologies and systems; and energy storage and distribution. Coursework for the certificate program also leads to the A.A.S. degree in Energy Technology.
Lower Division Core
Category Name: Energy Technology Core Requirements Rule: All courses are required
Criterion: C- Number of Credits 27
Course Listing
BGEN 105S Introduction to Business 3
ETEC 105 DC Circuit Analysis 4
ETEC 106 AC Circuit Analysis 3
ETEC 113 Circuits Lab 1
NRGY 101 Intro to Sustainable Energy 3 F,S
NRGY 195 Practicum 2 SU
NRGY 214 Energy Storage and Dist. 3 S
NRGY 298 Internship 2 F,S
WRIT 101 College Writing I 3
Commentary: WRIT 121 Technical Writing may be substituted for WRIT 101 at the discretion of the program director based on future career and educational goals.
Commentary: Major Electives

Category Name: Energy Electives Rule: Take 3 credits

Criterion: C- Number of Credits 3

Course Listing

GEO 151	Introduction to Fossil Fuels	3		
NRGY 241	Alternative Fuels	3	F	
NRGY 242	Solar Thermal & Wind Systems		3	F
NRGY 243	Fundmtl PV Design & Install	3	S	
NRGY 244	Bioenergy	3	S	
NRGY 245	Fuel Cells	3	S	
NRGY 246	Geothermal Energy Technology		3	F
NRGY 250	Energy Finance	3	SU	
NRGY 290	Undergraduate Research	1 To 10	F,S	
NRGY 291	Special Topics	1 To 4	I	
NRGY 292	Independent Study	1 To 9	F,S	
NRGY 299	Energy Technology Capstone	3	S	

Missoula College Catalog Year: 2015-2016

Degree Type: Professional Certificate Level: Certificate Subject: **Health Information Technology: Computing**

Total Credits: 13 Cumulative GPA Required: 2.0

The Information Systems Management option emphasizes application development and business processes. Students learn to write software using an object-oriented programming paradigm for deployment to the web and the desktop. Relational database design, structured query language (SQL), and the ability to create applications which push and pull information from databases are highlighted. Graduates seek careers as computer support specialists, help desk technicians, web developers, software developers, and database administrators.

Lower Division Core

Category Name: Health Information Courses Rule: All courses are required

Criterion: C- Number of Credits 13

Course Listing

AHMS 144	Medical Terminology	3
AHMS 156	Medical Billing Fundamentals	3
HIT 101	Intro to Healthcare Informatic	3
HIT 265	Electronic Health Records	3
NRSG 100	Introduction to Nursing	1

Degree Commentary

This certificate requires both the courses listed below and the successful completion of a degree in a computing-related field, i.e. Information Technology.

Missoula College Catalog Year: 2015-2016

Degree Type: Professional Certificate Level: Certificate Subject: **Health Information Technology: Health Professions**

Total Credits: 18 Cumulative GPA Required: 2.0

Network Administrator has become a common job title across all career fields. The Network Management option provides students with a background in network administration for supporting users and computing in a networked

environment. Coursework in network operating systems, server administration, routers, switches, security, and IP telephony are all embedded in the Network Management option.
The University of Montana is a Cisco Networking Academy, IBM Academic Alliance, & a CompTIA Authorized Academy, and a member of the Microsoft Developers Network Academic Alliance. Opportunities exist for professional certification from Cisco (CCNA, CCENT, CCVA), Microsoft and Comp TIA (A+, Network+ and Security+).
Students entering the program should be prepared with basic computing skills (keyboarding, word processing, file management, and Internet applications) and adequate preparation in mathematics (completion of M 090 or equivalent placement scores). Underprepared students should allocate an additional semester to the suggested four semester sequence.
Lower Division Core
Category Name: Computing courses Rule: All courses are required
Criterion: C- Number of Credits 18
Course Listing

CSCI 172	Intro to Computer Modeling	3
CSCI 240	Databases and SQL	3
HIT 101	Intro to Healthcare Informatic	3
HIT 265	Electronic Health Records	3
ITS 150	CCNA 1: Exploration	3
ITS 210	Network OS - Desktop	3

Commentary: Degree Commentary
This certificate requires the courses below in addition to the successful completion of a degree in a clinical health profession-related field, i.e. nursing.

Missoula College Catalog Year: 2015-2016

Degree Type: Associate of Applied Science Level: Major Subject: **Information Technology**
Option: **Information Systems Management**
Total Credits: 60 Cumulative GPA Required: 2.0
The Information Systems Management option emphasizes application development and business processes. Students learn to write software using an object-oriented programming paradigm for deployment to the web and the desktop. Relational database design, structured query language (SQL), and the ability to create applications which push and pull information from databases are highlighted. Graduates seek careers as computer support specialists, help desk technicians, web developers, software developers, and database administrators.
Lower Division Core
Category Name: Information Technology Core Courses Rule: All courses are required
Criterion: C- Number of Credits 28
Course Listing

BGEN 105S	Introduction to Business	3	
CSCI 135	Fund of Computer Science I	3	
CSCI 172	Intro to Computer Modeling	3	F,S
ITS 150	CCNA 1: Exploration	3	F,S
ITS 165	OS Commands and Scripts	3	S
ITS 210	Network OS - Desktop	3	F

ITS 280	Computer Repair & Maint.	3	F
ITS 289	Professional Certification	1	F,S
WRIT 101	College Writing I	3	

Commentary: Completion of IT core courses fulfills requirements for CAS in computer support.
Subcategory Name: Mathematics
Rule: Any Mathematics course level 115 or higher
Criterion: C- Number of Credits 3
Course Listing Commentary:
Commentary: Option Requirements
Category Name: Information Systems Option Requirements Rule: All courses are required
Criterion: C- Number of Credits 23
Course Listing

COMX 111A	Intro to Public Speaking	3	
CSCI 113	Programming with C++ I	3	
CSCI 136	Fund of Computer Science II	3	
CSCI 215E	Social & Ethical Issues in CS	3	
CSCI 221	System Analysis and Design	3	S
CSCI 240	Databases and SQL	3	F
ITS 298	Internship/Cooperative Educati	2	
MART 232	Interactive Web II	3	

Commentary: Option Requirements
Category Name: Information Systems Directed Electives Rule: Required; take a minimum of 6 credits
Commentary: Student must select at least two directed elective courses (minimum of 6 credits). Directed electives must be approved by student's advisor. Examples of directed electives may include courses from the ACTG, BGEN, COMX, CSCI, DDSN, ITS, or WRIT rubrics. A student may request substitution of other courses to fulfill the directed elective requirement provided a clear connection can be made between a course, a student’s career objective, and the degree program. All substitution requests require departmental approval.

Missoula College Catalog Year: 2015-2016

Degree Type: Associate of Applied Science Level: Major Subject: **Information Technology**
Option: **Network Management**
Total Credits: 60 Cumulative GPA Required: 2.0
Network Administrator has become a common job title across all career fields. The Network Management option provides students with a background in network administration for supporting users and computing in a networked environment. Coursework in network operating systems, server administration, routers, switches, security, and IP telephony are all embedded in the Network Management option.
The University of Montana is a Cisco Networking Academy, IBM Academic Alliance, & a CompTIA Authorized Academy, and a member of the Microsoft Developers Network Academic Alliance. Opportunities exist for professional certification from Cisco (CCNA, CCENT, CCVA), Microsoft and Comp TIA (A+, Network+ and Security+).
Students entering the program should be prepared with basic computing skills (keyboarding, word processing, file management, and Internet applications) and adequate preparation in mathematics (completion of M 090 or

equivalent placement scores). Underprepared students should allocate an additional semester to the suggested four semester sequence.

Lower Division Core

Category Name: Information Technology Core Courses Rule: All courses are required

Criterion: C- Number of Credits 28

Course Listing

BGEN 105S	Introduction to Business		3	
CSCI 105	Computer Fluency	3	F,S	
CSCI 110	Programming - VB I	3	F,S	
ITS 150	CCNA 1: Exploration	3	F,S	
ITS 165	OS Commands and Scripts		3	S
ITS 210	Network OS - Desktop	3	F	
ITS 280	Computer Repair & Maint.		3	F
ITS 289	Professional Certification		1	F,S
WRIT 101	College Writing I	3		

Commentary: Completion of IT core courses fulfills requirements for CAS in computer support.

Subcategory Name: Mathematics

Rule: Any Mathematics course level 115 or higher

Criterion: C- Number of Credits 3

Course Listing Commentary:

Commentary: Option Requirements

Category Name: Network Management Option Requirements Rule: All courses are required

Criterion: C- Number of Credits 29

Course Listing

COMX 111A	Intro to Public Speaking		3	
CSCI 215E	Social & Ethical Issues in CS		3	
ITS 152	CCNA 2: Exploration	3	F	
ITS 212	Network OS - Server Admin		3	F
ITS 214	Network OS - Infrastructure		3	S
ITS 222	Enterprise Security	3	S	
ITS 250	CCNA 3: Exploration	3	S	
ITS 252	CCNA 4: Exploration	3	S	
ITS 255	IP Telephony	3	S	
ITS 298	Internship/Cooperative Educati	2		

Missoula College Catalog Year: 2015-2016

Degree Type: Professional Certificate Level: Certificate Subject: **Network & Info Security Prof**

Total Credits: 16 Cumulative GPA Required: 2.0

Lower Division Core

Category Name: Core Certificate Courses Rule: All courses are required

Criterion: C- Number of Credits 16

Course Listing

ITS 271	Securing Desktop/Mobile Dev.		4	

ITS 273 Securing Networks 4
ITS 275 Border/Perimeter Network Sec 4
ITS 277 Software Assurance and File Sy 4
Commentary: Degree Commentary
Prerequisite skills needed to succeed in this proposed NIS certificate program are met with a degree in Network Management or related field or equivalent work experience. It would be helpful for incoming students to have industry certifications such as A+, CCNA, Security+, Microsoft Servers, or Net+ to establish an appropriate baseline skill set.

Missoula College Catalog Year: 2015-2016
Degree Type: Technical Certificate Level: Certificate Subject: **Recycling Technology**
Total Credits: 16 Cumulative GPA Required: 2.0
Lower Division Core
Category Name: Core Courses
Rule: Must complete all of the following courses:
Criterion: C- Number of Credits 16
Course Listing
BGEN 160S Issues in Sustainability 3
ITS 221 Project Management 3
NRGY 102 Intro to Sustainable Energy II 3
NRGY 241 Alternative Fuels 3
NRGY 270 Recycling Technology 4

Department Faculty

Professors

- Thomas Gallagher, IT Program Director/Professor
- Dennis Labonty, Ph.D.

Associate Professors

- Bradley Layton, Energy Technology Program Director/Associate Professor

Assistant Professors

- Xueying Shen, Department Chair/Electronics Technology Program Director
- Steven Stiff, Assistant Professor

Adjunct Faculty

- Jonathan Bowe, Adjunct Instructor
- Dianne Burke, Cybersecurity Program Director/Adjunct Instructor
- Conor Darby
- Alan Fraser

- Corryn Greenawalt
- Matt Grimes, FabLab Director
- Wally Higgins, Adjunct Instructor
- Eric Iverson
- Brian Kerns
- Kari McLean, Adjunct professor
- Krista Milligan
- Marc Olson, Adjunct Instructor
- Zachary Rossmiller
- Troy Savage, Adjunct Instructor
- Craig Schaeffer
- Alexander Sievers, Adjunct Instructor
- John Taber
- Lagan Todd, Adjunct Instructor

Course Descriptions

Computer Technology (COT)

CRT 188T - Computers and Law
Credits: 3. Offered autumn. Prereq., CAPP 120 and LEG 185T. Intermediate concepts of computer systems, operating systems, graphical environments, electronic mail, Internet, and file management. A variety of applications including word processing, spreadsheet, database, presentation, and law-related software are included. Course Attributes: Technical Course
CRT 205T - Food Serv Mgmt Comp App
Credits: 2. Offered spring. Prereq., CAPP 120. Introduction to computerized applications relevant to the food service industry. Includes spreadsheet, recipe management and word processing software; appropriate industry reports, create menus and fliers; import, export and scale recipes; analyze nutrition; and calculate food cost. Course Attributes: Technical Course

Computer Science/Programming

CSCI 110 - Programming - VB I
Credits: 3. Offered autumn and spring. M 090 or ALEKS score >2 recommended prior to taking course. An introduction to object-oriented programming using an even-driven paradigm. Basic concepts of control structures, data handling, documentation, and error control. Fundamentals of algorithm design and structured software development.
CSCI 113 - Programming with C++ I
Credits: 3. Offered intermittently. M 090 or ALEKS score >2 recommended prior to taking course. Object oriented programming using C++. Implementation of structured programming concepts along with construction of classes to create data types for defining objects.
CSCI 120 - Programming - VB II

Credits: 3. Offered autumn. Prereq., CSCI 110. Design and implementation of software using object-oriented programming practices. The class framework is used to apply the object-oriented techniques of encapsulation, polymorphism, and inheritance.

CSCI 215E - Social & Ethical Issues in CS

Credits: 3. Offered autumn and spring. Prereq., WRIT 101. Exploration of ethical issues in the field of computing. Skills needed to identify and analyze various ethical concerns. Standard ethical concepts and theories, methods of ethical analysis. Strong emphasis on practical application of the ethical process. Course Attributes: Ethical & Human Values Course Writing Course-Intermediate

CSCI 221 - System Analysis and Design

Credits: 3. Offered spring. Prereq., CSCI 240. Analysis of the system development life cycle. Emphasis on planning, analyzing, designing, implementing and supporting information systems to meet business requirements. Covers feasibility studies, time and cost estimates, modeling tools, design tools, implementation and support strategies. A simulated business design project will be developed.

CSCI 240 - Databases and SQL

Credits: 3. Offered autumn. Prereq., CSCI 172 or consent of instr. Relational database design including: requirements analysis, data structure, entity relationships, normalization, relational algebra and integrity. Physical implementation focusing on data storage; retrieval and modification; concurrency; optimization; security; SQL; and XML.

Drafting Design

DDSN 113 - Technical Drafting

Credits: 3. Offered autumn. An introduction to the techniques and standard practices of communicating technical graphics. The class studies and practices drawing skills and learns the drawing standards that support the needs of the design team in advancing ideas. It also provides the foundation for successful drawing communication in the CAD environment. Topics covered include; drawing media and tools, hand drawing skills, perspectives, views, sketching, standard scales, geometric construction, sections, dimensioning, and tolerances.

DDSN 114 - Introduction to CAD

Credits: 3. Offered autumn. M 090 or ALEKS score >2 recommended prior to taking course. An introduction to computer aided design and drafting software for production of drawings and plans for architecture and engineering systems. Fundamentals of two dimensional drafting and drawing management for professional design.

DDSN 116 - 3D CAD

Credits: 3. Offered autumn. Prereq. or Co-req., DDSN 114. CAD II provides a project-based, in-depth study of the skills and concepts involved in Computer Aided Design and Drafting. Topics covered include object grouping and sharing; three dimensional modeling; animation; and interoperability with other software. This course is the second in a two-part series covering the core AutoCAD application.

DDSN 191 - Special Topics

Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Course Attributes: Technical Course

DDSN 192 - Independent Study

Credits: 1 TO 6. (R-6) Offered intermittently. Prereq., consent of instr. Independent research in geography or planning.

DDSN 244 - GIS Mapping

Credits: 3. Offered Spring. Basics of geospatial technologies; remotely sensed imagery, GIS, and GPS and how each of the individual areas can be used together to analyze spatial datasets. Students will explore a wide range of spatial data and will learn to apply these data sets to real-world solutions.

DDSN 245 - Civil Drafting

Credits: 4. Offered spring. Prereq. DDSN 114. Introduces students to computer aided design software for common survey and engineering design and drafting applications. Topics include collection of survey data; the coordinate geometry system; surfaces; subdivision and land planning; road design and corridor modeling; utilities; site grading and drainage; mapping; and 3D visualization.

Electronics Technology

ETEC 105 - DC Circuit Analysis

Credits: 4. Offered autumn and spring. M 090 or ALEKS score >2 recommended prior to taking course. An introduction to direct current (DC) and analysis of series, parallel, and series-parallel circuits. Topics include electrical quantities, units of measurement, measurement instruments, resistors, current, voltage, power, energy, network theorems, equivalent circuits, magnetism, and electromagnetism. Laboratory experiments include circuit analysis; the proper use of measurement equipment and techniques; and troubleshooting.

ETEC 106 - AC Circuit Analysis

Credits: 3. Offered autumn and spring. Analysis of alternating current (AC) circuits and the behavior of capacitors, inductors, reactance, impedance, transformers, and signal filters. Laboratory experiments include circuit analysis, the use of proper measurement equipment, and troubleshooting.

ETEC 113 - Circuits Lab

Credits: 1. Offered autumn. Prereq/Co-req., ETEC 105. Covers proper techniques of soldering and tool usage. Electronic technical language, hands on troubleshooting skills and basic electronic measurements are involved.

ETEC 120 - Electrician Fundamentals NCCER Level I with NCCER Core Curriculum

Credits: 4. Students will learn the fundamentals of installing electrical systems in structures. These systems will include wiring, circuit breaker panels, switches, and light fixtures. Students will also learn to read and follow blueprints in accordance with the National Electrical Code® as well as state and local codes. The course largely follows the first level of NCCER’s 4-level Electrical curriculum that complies with DOL time-based standards for apprenticeship.

ETEC 191 - Special Topics

Credits: 1 TO 6. (R-6) Offered Intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

ETEC 213 - Power Systems Technology

Credits: 3. Offered spring. Prereq., ETEC 106, M 121, Prereq/Co-req., M 122. A review of the principles of electricity, magnetism, and transformer action; the application of these principles in the operation of single-phase and three-phase ac/de motors, alternators, and generators; and the control methods for these electrical devices.

ETEC 214 - Energy Storage and Dist.

Credits: 3. Offered spring. Prereq. ETEC 106, NRGY 101, and M 121 or consent of instructor. Studies storage and transport methods of different types of energy. Explores emergent technologies and mechanisms designed to enhance efficiency and safety, including ‘smart grid’ technologies; assesses relative social, ec\onomic and environmental merits of each type of energy system in terms of its storage and distribution.

ETEC 240 - Robotics

Credits: 3. Offered spring. Prereq. or Co-req., ETEC 250. Explores physical and operating characteristics of a robot. Topics include robot configurations, power supplies, control systems, end effectors, sensors, stepper motors and stepper controls. Robot programming also is covered and a typical robot is programmed to perform repetitive actions. Includes hands-on labs.

ETEC 245 - Digital Electronics

Credits: 4. Offered autumn. Prereq., ETEC 250. Explores digital electronic circuits and devices that make up a computer system. Topics include binary and hexadecimal number systems, Boolean algebra and digital logic theory, simple logic circuits, combinational logic, and sequential logic. Also covered is the analog-to-digital and digital-to-analog interfaces between a digital system and the real (analog) world. Includes hands-on labs.

ETEC 250 - Solid State Electronics I

Credits: 4. Offered spring. Prereq. ETEC 105. An introduction to semiconductor technologies used in solid state electronics with an emphasis on diodes and transistors. Classroom concepts are reinforced through lab-based experiments.

ETEC 251 - Solid State Electronics II

Credits: 3. Offered autumn. Prereq. ETEC 250. An introduction to semiconductor technologies used in solid state electronics with an emphasis on amplifier circuits, field effect transistors, thyristors, and operational amplifiers. Classroom concepts are reinforced through lab-based experiments.

ETEC 260 - Data and Network Communication

Credits: 3. Offered autumn. Prereq., ETEC 250. Explores the principles, applications, and theory of data communication systems. Topics include communication concepts and terminology, analog and digital channel characteristics, signaling techniques for analog and digital data, communication codes, transmission media, and standards and protocols for various data communication systems including computer networks, and the public switched telephone network. Includes hands-on labs.

ETEC 265 - Control Systems

Credits: 4. Offered autumn. Prereq., ETEC 250. The course provides a comprehensive coverage of components, circuits, instruments, and control techniques used in continuous and discrete automatic control systems, and focuses on basic principles, operation and applications. Programming, interfacing, and applications of programmable logic controllers are emphasized, including PLC hardware components, ladder logic diagram, fundamentals of PLC programming, and PLC interfacing and troubleshooting. Laboratory experiments and course projects are included in the course.

ETEC 270 - Wireless Communications

Credits: 4. Offered autumn. Prereq., ETEC 250. Explores audio and radio frequency (RF) circuits. Topics include AM and FM signal modulation and demodulation, RF transmitters, RF receivers, RF amplifiers, audio amplifiers, oscillators, mixers, and antennas. Includes hands-on labs.

ETEC 275 - Microprocessors and Microcontrollers

Credits: 4. Offered spring. Prereq., ETEC 250 and prereq., or Co-req., CSCI 113. The course introduces the fundamental concepts, basic principles of the architecture, organization, operation and applications of microprocessors and microcontrollers. Programming in assembly language and in C, and interfacing of microprocessor systems are emphasized. Laboratory experiments and course projects are included in the course to increase the hands-on skills of the students.

ETEC 291 - Special Topics

Credits: 1 TO 6. (R-6) Offered Intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

ETEC 295 - Special Topics
Credits: 1 TO 6. (R-6) Offered Intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.
ETEC 298 - Internship
Credits: 2. Offered intermittently. Consent of instructor required. Extended classroom experience providing practical application of classroom learning through on the job training in a student's field of study. This experience increases student skills, prepares them for initial employment, and increases occupational awareness and professionalism.
ETEC 299 - Electronics Capstone
Credits: 3. Offered spring. Prereq., ETEC 275. Completion of project prototypes. Includes comprehensive final project from conception to market.

Health Information Technology

HIT 101 - Intro to Healthcare Informatic
Credits: 3. Introduces the discipline of healthcare information technology. An overview of the subject including history, basic knowledge of healthcare informatics and tools as applied in support of healthcare delivery. Students will gain an introductory level about the complexities of health care and how informatics fits within the US Healthcare System.
HIT 265 - Electronic Health Records
Credits: 3. Prereq., HIT 101. An introduction to the electronic health record (EHR). Students will study the use of the EHR in improving healthcare quality, accessibility, and cost-effectiveness. EHR implementation and its use within the internal clinical office will be examined. The EHR will be studied in the context of a comprehensive Health Information System (HIS) supporting our society’s interdisciplinary clinical healthcare system.

Information Technology Systems

ITS 150 - CCNA 1: Exploration
Credits: 3. Offered autumn and spring. M 090 or ALEKS score >2 recommended prior to taking course. Introduction to networking field including terminology; protocols; local-area and wide-area networks; the OSI model; topologies; IP addressing; cabling and cabling tools; routers and router programming. Ethernet and network standards; and wireless technologies.
ITS 152 - CCNA 2: Exploration
Credits: 3. Offered fall. Prereq., ITS 150. Covers router theory and technologies including configurations, IOS software management, routine protocol configuration, TCP/IP, access-lists and introduction to LAN switching.
Course Attributes: Technical Course
ITS 165 - OS Commands and Scripts
Credits: 3. Offered spring. Introduction to operating system concepts through the use of contemporary software. Emphasizes file system management, networking, installation, maintenance, management, and disaster recovery practices using both the command interpreter and graphical user interface.
ITS 191 - Special Topics
Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.
ITS 210 - Network OS - Desktop

Credits: 3. Offered autumn. Prereq., ITS 150. In-depth study of a secure, multi-user, client-based network operating system. Topics include installation, administration of resources, performance, network services, and security. Course Attributes: Technical Course

ITS 212 - Network OS - Server Admin

Credits: 3. Offered autumn. Prereq./Co-req, ITS 210. Server technologies commonly used in local area networking. Topics include installation, administration, storage, application services, network services, security, reliability, and availability. Course Attributes: Technical Course

ITS 214 - Network OS - Infrastructure

Credits: 3. Offered fall. Prereq., ITS 212. Principles and implementation of enterprise networking services. Topics include Protocol Binding, DNS, DHCP, WINS, Remote Access, IP Routing, IP Security, Network Address Translation, and Certificate Services. Course Attributes: Technical Course

ITS 221 - Project Management

Credits: 3. Offered autumn. Prereq., CSCI 172. Investigation of topics in project management including scope, definition, risk, procurement and the RFP. Management of time, cost, quality, and human resources. Concepts are reinforced with PM software.

ITS 222 - Enterprise Security

Credits: 3. Offered spring. Prereq./Co-req, ITS 214. Examination of general information technology security concepts. Topics include access control, authentication, attack methods, remote access, web security, wireless networks, cryptography, internal infrastructure security, and external attacks. Security procedures, organizational policies, risk management and disaster recovery addressed. Course Attributes: Technical Course

ITS 250 - CCNA 3: Exploration

Credits: 3. Offered spring (first half). Prereq., ITS 152. Covers router configurations including advanced IP addressing techniques, variable length subnet masking, intermediate routing protocols, Ethernet switching, virtual LANs, spanning-tree protocol, and VLAN trucking protocol. Course Attributes: Technical Course

ITS 252 - CCNA 4: Exploration

Credits: 3. Offered (second half). Prereq., ITS 152. Project-based course in wide-area networking including advanced IP addressing techniques, network address translation, port address translation, DHCP, WAN technology and terminology, PPP, ISDN, DDR, Frame Relay, network management, and introduction to optical networking.

ITS 255 - IP Telephony

Credits: 3. Offered autumn. Prereq./Co-req. ITS 150. Provides an introduction to converged voice and data networks as well as challenges faced by the various technologies. Presents solutions and implementation considerations for signaling, quality of service, security, call control, dial plans, gateway protocols, messaging, congestion, and connecting to a PSTN network. Course Attributes: Technical Course

ITS 271 - Securing Desktop/Mobile Dev.

Credits: 4. Course provides advanced technical information and relevant skills to successfully secure end-user devices, including desktop and laptop systems, tablets, cellular phones, and other portable computing equipment. Building on existing knowledge and skills in the areas of server management, network management, and security, students will gain mastery-level knowledge of security issues and best practices. Course content covers client/server exposures and protections (authentication options, packet signing and encryption of network traffic, appropriate implementation of permissions and rights); malware threats and treatments; transmission choices and precautions (wired, wireless, remote desktop access, virtual private networking (VPN)); cloud computing considerations; and corporate mobile device best practices. Hardening of the operating system and application software is also covered. Course content will focus on business-focused security practices to prepare students for