OREGON TECH Curricular Changes - Effective for Academic Year [2014-15]

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Effective Term	New (N) Modified (M) Deleted (D)	Prefix	Course#	Course Title	Credits	Course Description	Type of Change (for modified classes only)	Comments
201401	N	ABA	511	Foundations of ABA I	3-0-3	Basic principles, characteristics, and concepts of Applied Behavioral Analysis (ABA). Includes history of ABA, terminology, and applications.		
201401	N	ABA	512	Foundations of ABA II	3-0-3	Basic principles, characteristics, and concepts of Applied Behavioral Analysis (ABA).Foundational knowledge for practice of ABA; introduction to measurement and data analysis. Prerequisites: ABA 511		
201401	N	ABA	521	Ethics and Professional Issues I	3-0-3	Introduction to ethical and professional issues in Applied Behavior Analysis (ABA). Professional identity, certification and licensure, code of conduct, confidentiality and privacy.		
201401	N	ABA	522	Ethics and Professional Issues II	3-0-3	Examines ethical and professional issues in Applied Behavior Analysis (ABA) including ethical and professional conduct, ethical decision making, implementation, management and supervision, and professional practices. Prerequisite: ABA 521		
201401	N	ABA	525	Research Methods in ABA	3-0-3	Methods for conducting valid and reliable behavioral measurement and experimental evaluations of behavioral interventions, including data collection, data display, and data interpretation and designing and evaluating behavioral research designs.		
201401	N	ABA	526	Behavioral Assessment	3-0-3	Behavioral assessment including descriptive assessments and functional analysis; methods of assessment, data collection and interpretation; assessment based selection of intervention; ethical and practical issues.		
201401	N	ABA	531	Behavioral Change I	3-0-3	Fundamental elements of, and ethical and practical considerations related to behavior change, behavioral interventions, behavior change systems, and specific behavior change procedures. Prerequisite: ABA 512		

201401	N	ABA	532	Behavior Change II	3-0-3	Behavior analytic interventions. Fundamental elements of, and ethical and practical considerations related to behavior change, behavioral interventions, behavior change systems, and specific behavior change procedures. Prerequisite: ABA 531		
201401	N	ABA	535	Special Topics in ABA	3-0-3	Examination of systems, interventions, current issues, and/or advances in Applied Behavior Analysis; includes focus on strategies for managing program implementation and supervision of behavior change agents. Topics vary. Prerequisite: ABA 525		
201401	N	ART	205	Introduction to Watercolors	3-0-3	Introductory studio course in beginning watercolor painting. Students will learn a variety of watercolor techniques as well as elements of design and aesthetics.		
201401	M	ART	210	Beginning Scultpure	3-0-3	Introductory studio course in beginning sculpture, emphasizing basic materials and techniques.	Lecture hours, lab hours changes	
201401	M	ART	220	Basic Drawing	3-0-3	Designed for the student who has an interest in exploring the field of pictorial representation but has had, for a variety of reasons, little opportunity to do so.	Lecture hours, lab hours changes	
201401	M	ART	280	Introductory Painting	3-0-3	Offers an opportunity to study rendering in color by exposure to a study of color and color mixing, tones and values with an introduction to acrylics, watercolor and oils.	Lecture hours, lab hours changes	
201401	M	ART	282	Introduction to Acrylic Painting	3-0-3	Introductory studio course with emphasis on basic materials and techniques in acrylic painting.	Lecture hours, lab hours changes	
201401	M	BIO	101	Introduction to Cell Biology	3-3-4	Introduction to cell biology, genetics, basic chemistry of living organisms, and the scientific method.	Title and Description	
201401	M	BIO	102	Introduction to Organismal Biology	3-3-4	Evolution and phylogenetics among all major groups of living organisms, including bacteria, protists, fungi, plants and animals.	Title and Description	
201401	M	BIO	103	Introduction to Human Anatomy & Physiology	3-3-4	Basic human anatomy and physiology, including a survey of all major bodily systems. (Cannot be used for graduation credit by students who have taken BIO 231, BIO 232 and BIO 233)	Title and Description	
201401	D	BIO	261	Sophomore Project Proposal	1-0-1			
201401	D	BIO	262	Sophomore Project	1-9-4			
201401	D	BIO	471	Senior Project Proposal Research	1-0-1			
201401	D	BIO	472	Senior Project Proposal	1-0-1			

201401	D	BIO	473	Senior Project Data Collection	1-6-3			
201401	D	BIO	474	Senior Project Data Analysis and Presentation	0-5-2			
201401	D	BIO	112	Introduction to Data Analysis	1-0-1			
201401	N	CE	421	Seepage and Earth Structures	3-0-3	Covers material related to analyzing steady state and transient seepage conditions, erosion and piping, and the stability of earth slopes and embankments. Prerequisites: GEOL 201, CE 311, CE 312, all with grade “C” or better.		
201401	N	CE	422	Advanced Shear Strength of Soils	3-0-3	This course is designed to give students an advanced understanding of the shear strength of soils including drained and undrained strength of fine and coarse grained soils. Prerequisites: GEOL 201, CE 311, each with grade of “C” or better.		
201401	N	CE	423	Deep Foundations	3-0-3	This course covers the design of deep foundation systems including driven piles and drilled shafts. These systems are designed for both axial and lateral loading. Prerequisites: GEOL 201, CE 311, CE 312, all with grade “C” or better.		
201401	N	CE	433	Structural Matrix Analysis	3-0-3	Static analysis of determinate and indeterminate structures using the direct stiffness method with heavy emphasis on computer models and solutions. Students will design and develop their own structural analysis program. Prerequisites: CE 331 and MATH 341, each with grade "C" or better.		
201401	N	CE	439	Highway Bridge Rating	3-0-3	Introduction to bridge types, bridge design philosophies and bridge rating procedures. Load rating of short-span highway bridges using AASHTO provisions and ODOT procedures. Software applications. Prerequisites: CE 341 with grade “C” or better.		
201401	N	CE	449	Bridge Design	3-3-4	Design and analysis of short and medium-span highway bridge superstructures including reinforced concrete, slab bridges, steel deck girder bridges, and prestressed concrete bridges. Software applications. Prerequisites: CE 341 with grade “C” or better.		

201401	N	CE	450	Transportation Structures	2-3-3	Design and analysis of common transportation structures including culverts, sign structures, light poles, and railings according to current AASHTO provisions and ODOT procedures. Software applications. Prerequisites: CE 341 with grade “C” or better.		
201401	N	CE	458	Transportation Safety	4-0-4	Safety concepts in highway engineering including highway design, operation, and maintenance, as well as human factors, statistical analysis, traffic control and public policy. Design concepts of intersections, interchanges, signals, signs and pavement markings. Pre-requisite: CE 354 with grade "C" or better.		
201401	N	CE	468	Travel Demand Modeling	3-3-4	Introduction to travel demand analysis and forecasting. Models studied from a theoretical, applied and practical perspective. Students will become familiar with the traditional four-step travel forecasting process, including model development, application and interpretation of outputs. Pre-requisites: CE 351 with grade "C" or better.		
201401	N	CE	472	Hydrometry	2-3-3	Measurement of variables in the hydrologic cycle. Principles, methods, instruments, and equipment for obtaining surface and ground water quantity and quality data in nature to support design and water management efforts. Pre-requisite: CE 374 with grade "C" or better.		
201401	N	CE	476	Applied Hydraulic Design	2-3-3	Flow analysis for constructed channels; principles of hydraulic design of culverts, bridge waterway openings, highway inlets, rundowns, and appurtenant water control structures. Computer modeling of bridge and culvert hydraulics. Design of appropriate Best Management Practices (BMPs) for stormwater quality and erosion control. Design project. Prerequisite: CE 374 with grade “C” or better.		
201401	M	CE	539	Highway Bridge Rating	2-3-3	Introduction to bridge types, bridge design philosophies and bridge rating procedures. Load rating of short-span highway bridges using AASHTO provisions and ODOT procedures. Software applications. Prerequisites: CE 341 with grade “C” or better.	Prerequisite Change	

201401	M	CE	549	Bridge Design	3-3-4	Design and analysis of short and medium-span highway bridge superstructures including reinforced concrete slab bridges, steel deck girder bridges, and prestressed concrete girder bridges. Software applications. Prerequisites: CE 539 with grade of "C" or better.	Prerequisite Change	
201401	M	CE	556	Advanced Pavement Design	2-3-3	This course covers advanced topics in the design and analysis of pavement materials and structures. Prerequisite: CE 456 with a grade of “C” or better.	Prefix, Course number, Description, Prerequisite changes	
201401	N	CE	590	Civil Engineering Graduate Project	Vary from 1-9	Research and preparation pertaining to the master’s project. Prerequisite: Advisor consent.		
201401	M	CHE	101	Introduction to General Chemistry	3-0-3	A brief presentation of introductory chemical concepts including atomic structure, the chemical equation, the behavior of gases, the chemistry of solution and acid-base chemistry. For students with good knowledge of algebra. Pre- or corequisite: Math 100 Corequisite: CHE 104 (lab)	Title	
201401	M	CHE	102	Introduction to Organic Chemistry	3-0-3	A continuation of CHE 101 with emphasis on organic chemistry. The role of organic chemistry in life and industrial processes is discussed. Prerequisite: CHE 101 with grade "C" or better, or instructor consent. Corequisite: CHE 105 (lab)	Title, Prerequisite	
201401	M	CHE	103	Introduction to Biochemistry	3-0-3	A continuation of CHE 102 with emphasis on biochemistry. The organic chemistry of biochemicals including proteins, carbohydrates, fats, as well as nucleic acids is discussed. Basic elements of metabolism are also explored. Prerequisite: CHE 102 with grade "C" or better, or instructor consent. Corequisite: CHE 106 (lab)	Title, Prerequisite	
201401	M	CHE	104	Introduction to General Chemistry Laboratory	0-3-1	Lab accompanying class content in CHE 104. Corequisite: CHE 101.	Title	
201401	M	CHE	105	Introduction to Organic Chemistry Laboratory	0-3-1	Lab accompanying class content in CHE 102. Corequisite: CHE 102.	Title	
201401	M	CHE	106	Introduction to Biochemistry Laboratory	0-3-1	Lab accompanying class content in CHE 103. Corequisite: CHE 103.	Title	

201401	D	CHE	235	Streamwater Chemistry and Sampling	1-6-3			
201401	D	CLS	412	Pathophysiology	2-0-2	Lecture course reviewing processes that underlie many different disease states and health deviations. The study of the most common disease processes in humans and their correlation with laboratory findings are explored.		
201401	M	CLS	422	Molecular Diagnostic Methods	2-3-3	CLS 422 Molecular Diagnostic Methods (2-3-3) Coverage of molecular techniques used in the clinical laboratory to diagnose disease. Topics covered include principles of molecular biology, nucleic acid isolation, purification, amplification, quantitation, and discrimination. Specimen collection/handling, ethical issues and molecular lab operations are also covered. Prerequisites: CLS 415, CLS 420, CLS 447.	Title, lecture hours, credit hours changes	
201401	M	CLS	432	Foundations of Clinical Laboratory Science I	3-3-4	The first of two courses covering essential practices of clinical laboratory science. Emphasis on lab safety, blood-borne pathogens, specimen collection including phlebotomy, laboratory mathematics, quality control and statistical approaches related to data evaluation and reporting systems, and basic lab techniques in-cluding microscopy and pipetting.	Description, lecture hours, lab hours changes	
201401	M	CLS	444	Microbiology I	4-6-6	Lecture/lab coverage of human bacterial pathogens seen in the clinical laboratory including gram positive and gram negative cocci, and gram positive and gram negative bacilli. Principles and methods of clinical microbiology laboratory diagnosis of bacterial diseases are studied.	Description Changes	
201401	M	CLS	445	Microbiology II	3-3-4	Lecture/lab coverage of human microbial pathogens seen in the clinical laboratory including anaerobes, spirochetes, mycobacteria, chlamydia, rickettsia, fungi, and viruses. Principles and methods of clinical microbiology laboratory diagnosis of diseases caused by these microbes are studied.	Description Changes	

201401	M	CLS	447	Clinical Chemistry Laboratory	4-6-6	Principles of chemical analysis, quality control, laboratory utilization, and safety. Hands-on exercises, demonstrations, and computer tutorials illustrating chemical analysis and data evaluation in a clinical chemistry laboratory. Discussion of case studies using problem-solving methods to analyze and interpret relevant chemical analysis data. Corequisite: CLS 415	Lecture hours, lab hours changes	
201401	M	CLS	449	Prinicples of Urinalysis	2-3-3	Lecture and laboratory coverage of renal function, urine formation, and methods used to analyze urine in the medical laboratory. Students perform physical, chemical, and microscopic analyses on clinical samples and correlate results with states of health and disease in man.	Title, Description, lecture hours, credit hours changes	
201401	M	CLS	457	Advanced Chemistry/Immunology Concepts	2-0-2	Directed study, review, and class discussion of clinical laboratory assay methodology and data interpreta-tion, and medical research methods including data analysis, regulatory requirements, and ethical issues. Relevant medical case studies and contemporary scientific research papers are presented and critiqued by students. Prerequisites: CLS 415, CLS 416, CLS 420, and CLS 447	Title, description, prerequisites, corequisites changes	
201401	M	CLS	462	Foundations of Clinical Laboratory Science II	1-3-2	The second of two courses covering essential practices of clinical laboratory science. Emphasis on labora-tory operations and management issues including employment and career development, laboratory finance and marketing, quality assurance, interpersonal and public relations, professionalism, ethics, leadership and compliance issues. Prerequisite: CLS 432	Description Changes	
201401	N	COM	109	Introduction to Communication Technology	2-3-3	Introduction to the use of communication technology. Emphasis on the use of various communication technologies including social media, instant messaging, and visual communication technologies. Features projects using technology to effectively communication to various audiences.		

201401	N	COM	309	Communication Technology in Use	2-3-3	COM 309 Communication Technology in Use (2-3-3) Advanced use of communication technology. Emphasis on the use of communication technology to achieve specific communication goals. Features a large project using multiple communication technologies to reach specific audiences. Prerequisites: COM 109, MIS 101, MIS 102, MIS 103		
201401	N	COM	325	Gender and Communication	3-0-3	Introduces basic theories and concepts of culturally-derived gendered communication patterns and behaviors. Builds understanding and skills enabling students to analyze those patterns and behaviors in order to develop and practice effective communication strategies. Pre-Requisite: COM 205		
201401	N	COM	424	Capstone Course	3-0-3	Communication Studies majors complete a significant research project that bridges education with future profession or graduate school. Students collaboratively produce a project or portfolio reflecting strong critical thinking and application of communication theory and practice. Project topics vary by instructor. Prerequisites: Senior standing in the major, WRI 227		
201401	N	CSH	201	Human Development and Behavioral Health	3-0-3	Normal sleep architecture over the lifespan. Behavioral, physiological, and environmental patterns that contribute to healthy sleep.		
201401	N	CSH	220	Sleep Disorders and Co-Morbidities	3-0-3	Pathophysiology, epidemiology, and clinical presentation of abnormal sleep. Understanding and recognition of major co-morbidities associated with sleep disorders		
201401	N	CSH	225	Impact of Neurologic Disorders on Sleep	3-0-3	Effect and management of chronic neurological disorders on sleep quality and therapy outcomes.		
201401	N	CSH	233	Sleep Therapies and Coimpliance	3-0-3	Non prescription sleep therapies, PAP, CBT, Light Therapy, Chronotherapy and other treatment modalities. Patient compliance issues, predictors of outcomes, and psychological theories.		
201401	N	CSH	236	Pharmacology of Sleep	3-0-3	Different classes of medication, dependency, addiction, long term effect on sleep, and prognosis for other sleep therapies.		
201401	N	CSH	242	Evaluation and Measurement Tools	3-0-3	Physiological, psychological, and psychomotor evaluation and measurement tools to assess severity of sleep disorders and patient response to therapy.		

201401	N	CSH	268	Learning, Health Literacy, and Community Education	3-0-3	Adult education theories, appropriate communication strategies for health literacy, development of programming for patients, families, allied health providers, and community groups.		
201401	N	CSH	276	Capstone Project	3-0-3	Students develop, plan and implement a project for community sleep education. Instructor functions as a consultant. Prerequisite: CSH 268		
201401	N	CSH	277	Clinical Sleep Health Externship	0-40-13	Clinical skills essential for the practice of sleep case management. Patient assessment, creation of individualized care plans, long term compliance monitoring, and identification of changes in the status of other chronic diseases. Students must be employed in a clinical facility that treats sleep disordered patients. (400 contact hours) Prerequisites: CSH 268		
201301	**M**	CST	133	Digital Electronics II - Sequential Logis with HDL		Introduction to Sequential Logic, Latches, Flip/Flops, Timers, Counters/Registers, HDL Implementation, PLD HW Implementation, Finite State Machine Design/Analysis, Logic Testing, MPU System, Memory Devices, DC Parameters and Timing Analysis. Laboratory integral to the class. Students must register for a laboratory section. Prerequisite EE 131 or CST 162, both with grade "C" or better.	Prerequisite Change	
201401	M	CST	162	Introduction to Digital Logic	3-3-4	Introduction to combinational logic. Includes introduction to number systems, Boolean algebra, logic gates, Muxes, Decoders, Adders, Subtracters. Logic design using a hardware description language. Laboratory integral to the class. Pre or Corequisite: MATH 100	Description change	
201401	M	CST	412	Senior Development Project	2-3-3	First in a three-term sequence giving the student major responsibility for planning and carrying out a computer-oriented project. Individual creativity will be encouraged by allowing the student to select an appropriate project. Prerequisite: CST 334; CST 336 or CST 373.	Lab hour change from 5 to 3	

201401	M	CST	422	Senior Development Project	2-3-3	Second in a three-term sequence giving the student major responsibility for planning and carrying out a computer-oriented project. Individual creativity will be encouraged by allowing the student to select an appropriate project. Prerequisite: CST 412.	Lab hour change from 5 to 3	
201301	**M**	CST	134	Instrumentation		Lecture/laboratory course that provides students experience in measuring, calibrating, and testing digital and analog systems. Uses various test equipment for test and measurement of digital and analog components. Pre or Co-requisite: CST 133	Corequisite change	
201401	M	DH	223	Dental Hygiene Clinical Practice III	1-6-3	Sequential courses designed to provide clinical skills essential for the practice of dental hygiene. Skill development of patient appraisal, basic instrumentation, and individualized preventive care emphasized. Special emphasis on children up to 12 years old. Prerequisite: For DH 221–Admission to Dental Hygiene Program. Prerequisite: For DH 222–DH 221. Prerequisite: For DH 223–DH 222, CHE 360 and DH 252.	Prerequisite change	
201401	M	DH	253	Oral Radiology II	2-0-2	Specialized techniques for children, special needs patients, extra-oral procedures, occlusal projections, localization techniques, radiographic detection and interpretation of potential pathology. Prerequisite: DH 244 and DH 252.	Prerequisite Change	
201401	M	DH	401	Overview of Advanced Dental Hygiene	3-0-3	Introduction to the online degree completion program. Career opportunities, roles of the dental hygienists, and the different emphases within the program are explored. Prerequisite: Admission to BDHO program.	Prerequisite Change	
201401	M	DH	480	Community Health racticum	0-9-3	Students gain practical experience in public health by working in a public health setting. Individual goals and objectives are set by the student in consultation with the instructor. Prerequisite: AHED 450, DH 471, and admission to BDHO program.	Description and Prerequisite Change	

201401	M	DH	461, 462, 463	Restorative Dentistry I, II, III	(1-3-2) (1-3-2) (0-12-4)	Emphasis on dental restoration placement technique. Practical experience using restorative dental materials. Placement and finishing of amalgam and composite restorations on typodonts in Restorative dentistry I and on patients in Restorative Dentistry II and III. Prerequisite: for DH 461-DH 363 Prerequisite for DH 462 - 461 Prerequisite for DH 463 - 462	Description Change 461, 462 Description, lab hours, credit hours change 463	
201401	M	DH	363	Dental Materials	2-6-4	General properties, composition and manipulation of common dental and restorative materials. Expanded functions including denture relines and amalgam polishing are practiced.	Description, lab hours, credit hours changes	
201401	M	DHE	222	Dental Hygiene Clinical Practice II	0-12-4	Sequential course providing theoretical background for the clinical practice of dental hygiene. Problem solving and critical thinking related to patient assessment and management. Communication skills emphasized. Prerequisite: DHE 221 and CHE 360	Prerequisite Change	
201401	M	DHE	320	Dental Materials	2-6-4	General properties, composition and manipulation of common dental and restorative materials. Expanded functions including denture relines and amalgam polishing are practiced. Prerequisite: DHE 282	Title, Description, Prerequisite, Lab hours, Credit hours changes	
201401	M	DHE	351	Dental Analgesia	2-3-3	This course explores pain control methods, including local anesthesia and nitrous oxide/oxygen analgesia. Health information evaluation, local and systemic complications, anesthetic solutions, and vasoconstrictors and drug interactions are discussed. Techniques of local anesthesia, including block and infiltration injections are practiced. Administration of nitrous oxide is also practiced. Prerequisites: DHE 225, DHE 282	Prerequisite Change	
201401	N	DHE	461	Restorative Dentistry I	1-3-2	Emphasis on restoration placement techniques. Practical experience using restorative dental materials. Placement and finishing of amalgam and composite restorations on typodonts. Prerequisite: DHE 366		

201401	N	DHE	462	Restorative Dentistry II	1-3-2	Emphasis on restoration placement techniques. Practical experience using restorative dental materials. Placement and finishing of amalgam and composite restorations on typodonts and patients. Prerequisite: DHE 461		
201401	N	DHE	463	Restorative Dentistry III	0-12-4	Emphasis on restoration placement techniques. Practical experience using restorative dental materials. Placement and finishing of amalgam and composite restorations on patients. Prerequisite: DHE 462		
201401	D	DMS	315	Sonographic Superficial Structures	3-0-3	Survey of superficial imaging applications with emphasis on normal and abnormal musculoskeletal and breast sonography. Prerequisite: DMS 234 with grade “C” or better.		
201401	N	DMS	337	Breast Sonography	3-0-3	Breast sonographic scanning procedures with an emphasis on sonographic applications. Correlation with other imaging modalities. Prerequisite: DMS 225 with grade "C" or better.		
201401	N	DMS	346	Musculoskeletal Sonography	3-0-3	Survey of sonographic musculoskeletal imaging with emphasis on normal and abnormal findings. Prerequisite: DMS 225 with grade “C” or better.		
201401	M	DMS	352	Junior Lab I	0-3-1	DMS 352 Junior Lab I (0-3-1) Topics to include the male/female pelvis, first trimester, musculoskeletal, and breast stressing sonographic anatomy, standard imaging planes, and image quality. Prerequisite: DMS 254 with grade “C” or better.	Description Change	
201401	M	DMS	353	Junior Lab II	0-3-1	Topics to include normal first, second, third trimester, and cardiovascular stressing anatomy, standard imaging planes, and image quality. Prerequisite: DMS 352 with grade "C" or better.	Description Change, removal of corequisite	
201401	M	DMS	354	Junior Lab III	0-3-1	Applied sonographic laboratory procedures and techniques. Emphasis on protocols and case reviews. Prerequisite: DMS 353 with grade “C” or better.	Description Change, removal of corequisite	
201401	N	DMS	370	Obstetrical Sonography	3-0-3	Orientation to obstetrical scanning procedures and techniques. Emphasis on normal obstetrical anatomy and fetal development. Prerequisites: DMS 224, DMS 225 and DMS 234 with grade “C” or better.		

201401	D	DMS	371	Obstetrical Sonography First Trimester	3-0-3	Introduction to first trimester obstetrical ultrasound procedures and techniques. Emphasis on normal and abnormal sonographic first trimester presentation. Prerequisites: DMS 224, DMS 225 and DMS 234 with grade “C” or better.		
201401	D	DMS	372	Obstetrical Sonography Second/Third Trimester	3-0-3	Orientation to obstetrical scanning procedures and techniques. Emphasis on normal second and third trimester obstetrical anatomy. Prerequisite: DMS 371 with grade “C” or better.		
201401	M	ECHO	320	Cardiographic Methods	3-0-3	Recognition of ECG tracing with normal and abnormal arrhythmias, treadmill testing, holter monitoring, phonocardiography, and heart auscultation. Review of case examples for analysis and synthesis. Integration of cardiographic monitoring methods with cardiac ultrasound imagin. Review of cardiac anatomy. Prerequisite: ECHO 232	Prerequisite Change	
201401	M	ECHO	321	Echocardiography I	3-3-4	An introduction to scanning techniques and tomographic views according to the American Society of Echocardiography standards. B-mode image, pulsed and continuous wave Doppler, and color-flow imaging. Prerequisite: Admission into MIT Echocardiography Program	Prerequisite Change	
201401	M	EE	419	Power Electronics	3--3--4	Power electronic device characterization. Rectifiers, DC-DC converters and Inverters design, modeling, and build. Prerequisite: EE 321	Description and Prerequisite Change	
201401	M	EE	448	Geometric Optics	3-3-4	Reflection and refraction at plane and curved surfaces; imaging properties of lenses; first-order Gaussian optics and thin-lens system layout; matrix optics; ray-tracing software; spherical and chromatic aberrations. Prerequisite: PHY 223	number change from EE 352 to EE 448	Cross listed with PHY 448
201401	M	EE	449	Waveguides and Fiber Optics	3-3-4	Fundamentals of radiometry and photometry; detection of light using thermal and photon (photoemissive, photoconductive, and photovoltaic) methods; noise processes; blackbodies; charge transfer devices; spectroradiometry. Prerequisite: PHY 223, EE 223	Prerequisite Change and number change from EE 351 to EE 449	Cross listed with PHY 449

201401	M	EE	450	Physical Optics	3-3-4	Spherical and planar waves; scalar diffraction theory; Fresnel and Fraunhofer diffraction and application to measurement; interference and interferometers; optical transfer functions; coherent optical systems and holography. Prerequisite: PHY 223	Number change from EE 353 to EE 450	Cross listed with PHY 450
201401	M	EE	451	Lasers	3-3-4	Laser radiation properties, laser cavities, coherence, atomic spectra, pumping rate, power gain, threshold conditions, beam shape, mode structure; ion, molecular, solid-state, dye, semiconductor, and fiber lasers. Prerequisites: EE 450 or PHY 450	Prerequisite Change	Cross listed with PHY 451
201401	M	EE	452	Waveguides and Fiber Optics	3-3-4	Light propagation in fibers and waveguides; termination, coupling, and splicing of fibers; fiber optic communication; optical time domain reflectometry, fiber amplifiers, and fiber sensors. Prerequisites: EE 450 or PHY 450	Prerequisite Change	Cross listed with PHY 452
201401	M	EE	453	Optical Metrology	3-3-4	Modern optical metrology with emphasis on non-destructive testing; Fourier optics; Moiré and polarization methods; classic and holographic interferometry; speckle techniques; fringe analysis. Prerequisites: EE 450 or PHY 450	Prerequisite Change	Cross listed with PHY 453
201401	N	EE	471	Machine Learning I	4-0-4	Theory and practice of Genetic Algorithms, Evolution Strategies, Backprop, Kernel Methods, Naïve Bayes, Bayesian Belief Nets, Fuzzy Inference; brief discussion of Genetic Programming, Swarm Intelligence, Reinforcement Learning, Bayes Optimal Pre- or corequisite: Math 251		
201401	N	EE	471	Machine Learning I	4-0-4	Theory and practice of Genetic Algorithms, Evolution Strategies, Backprop, Kernel Methods, Naïve Bayes, Bayesian Belief Nets, Fuzzy Inference; brief discussion of Genetic Programming, Swarm Intelligence, Reinforcement Learning, Bayes Optimal Prerequisite: EE 430; or MATH 327 and CST116		
201401	N	EE	473	Machine Learning II	3-3-4	Integration of Information Theory and Statistical Learning into a generalized framework including Support-Vector Machines, Adaptive Resonance, and Adaptive Critics, plus project. Prerequisite: EE 471; CST 126 or ENGR 267; Math 341 or instructor approval		

201401	N	EE	473	Machine Learning II	3-3-4	Integration of Information Theory and Statistical Learning into a generalized framework including Support-Vector Machines, Adaptive Resonance, and Adaptive Critics, plus project. Prerequisite: EE 471		
201402	N	EMS	331	Critical Care Transport I	4-0-4	The first of 2 courses is designed to prepare paramedics to provide advanced critical care during interfacility transports, including performing advanced clinical patient assessments and providing invasive care beyond the standard scope of advanced pre-hospital care. Prerequisite: Paramedic Credentials or instructor permission		
201403	N	EMS	332	Critical Care Transport II	4-0-4	The second of 2 courses is designed to prepare paramedics to provide advanced critical care during interfacility transports, including performing advanced clinical patient assessments and providing invasive care beyond the standard scope of advanced pre-hosptial care. Prerequisites: EMS 331, EMS 381		
201402	N	EMS	381	Critical Care Clnical Practicum I	0-6-2	Students in the Critical Care Transport I course integrate didactic learning with clinical care of critical patients. Students work under the supervision of critical care providers in the critical care setting. Prerequisite: EMS 331		
201403	N	EMS	382	Clinical Care Clinical Practicum II	0-6-2	The continuation of clinical experiences where students integrate didactic learning with clinical care of critical patients. Students work under the supervision of critical care providers in the critical care setting. Prerequisites: EMS 331, EMS 381		
201401	N	EMS	444	EMS Systems Leadership and Management	3-0-3	Explores the fundamental skills of managing and leading in EMS: concepts, prinicples and practices of leaders in the EMS industry. Case study discussions and analysis. Examines EMS systems, operations, resources and regulation of EMS. Industry leaders provide guest lectures. Prerequisites: PSY 347, BUS 317		

201402	N	EMS	456	Research Methods in EMS	2-0-2	An introductory course in EMS research covering hypothesis formulation, design and use of data-gathering instruments, data collection, and methods of data analysis and presentation. Research and technical reports appearing in professional publications and archives are examined. Prequisite: MATH 361		
201402	N	EMS	496	Capstone Project I	1--6--3	Students formulate a detailed plan for a project or independent research studey within the EMS industry. Project plan will include topic outline and goals, timeline, industry contacts. Faculty advisor will be assigned. Prerequisites: WRI 227, MATH 361		
201403	N	EMS	497	Capstone Project II	1--6--3	Implementation and completion of student project planned in EMS 496. Project results to be delivered in a report presented to an audience of EMS peers. Students will have scheduled meetings with a faculty advisor to track progress and determine readiness for presentation. Prequisite: EMS 496		
201401	M	ENG	254	20th Century American Literature	3-0-3	Survey of American Literature from 1900-1970. Genres include short stories, novels, poetry, nonfiction narratives, and drama. Topics include Urban Gothic literature, Modernism, World Wars 1 and 2, and Environmentalism.	Title and Description	
201401	M	ENG	255	Contemporary American Literature	3-0-3	Survey of American Literature from 1970-present. Genres include short stories, novels, poetry, nonfiction narratives, graphic novels, and drama. Topics include Postmodernism, the Cold War, Cyberpunk Literature, Postapocalyptic Literature, and Environmentalism.	Title and Description	
201401	N	ENG	305	Ecological Issues in Nature Writing	3-0-3	Study of nature writers and the role of the environment in Western culture. Texts and authors will be studied from a literary studies perspective and a social justice perspective. Prerequisites: WRI 121 or WRI 122		

201401	N	ENG	315	Science Fiction Literature and Film	3-0-3	Study of science fiction literature and film as expressions of the relationship between technology and culture(s). Approach will primarily be from a literary analysis perspective, with elements of film studies included. Prerequisites: WRI 121 or WRI 122		
201401	N	ENG	335	Travel Literature: Fiction and Nonfiction	3-0-3	Study of travel narratives in Western Culture from the British Empire to today. Focus will be on narratives' depictions of wilderness vs. civilization and traveling as a transformative experience. Prerequisites: WRI 121 or WRI 122		
201401	N	ENG	345	Postapocalyptic Literature and Film	3-0-3	Inquiry into the recent popularity of postapocalyptic-themed literature and films. Study of postapocalyptic subgenres including natural disasters, rogue artificial intelligence, zombies, etc. and the historiocultural context from which they each have emerged. Prerequisites: WRI 121 or WRI 122		
201401	M	ENG	253	19th Century American Literature	3-0-3	Survey of American Literature from 1800-1900. Genres include short stories, novels, poetry, nonfiction narratives, and drama. Topics include Romanticism, Gothic literature, Transcendentalism, Colonialism, Emancipation, and Women's Rights.	Title and Description	
201401	N	ENG	325	The Metropolis	3-0-3	Study of the history of the modern city in Western culture from a cultural studies perspective. Students discuss works of literature, film, and new media dealing with our understanding of urban space over time. Prerequisites: WRI 121 or WRI 122		
201401	M	ENGR	266	Engineering Computation	2-3-3	Programming and problem solving using current computer software. General programming techniques using conditional statements, looping, subroutines, and data input/output will be stressed. Consideration of features specific to the software being used will also be presented. Prerequisite: MATH 111.	Title	
201401	N	ENGR	420	Engineering Modeling	3-3-4	Development of linear and nonlinear models of engineering systems. Modeling of mechanical, electrical, electromechanical, fluid, and thermal systems. System identification from data. Prerequisites: ENGR 266 or 267, MATH 341, EE 225 or MECH 490, PHY 223		

201401	N	ENGR	421	Automation Systems	3-3-4	Design of industrial automation systems. Industrial networking and data handling. Industrial controller and operator interface configuration and programming. Design of SCADA systems. Prerequisites: EE 355 or MECH 436, REE 463 or MECH 363, ENGR 420		
201401	N	ENGR	422	Process Control	3-3-4	Design of continuous and batch process control systems. Advanced control schemes, including model-based methods. Prerequisite: ENGR 421		
201401	N	ENGR	423	Motion Control and Robotics	3-3-4	Motion control components, including power supplies, controllers, instrumentation, and actuators. Robot kinematics and servo control. Design of motion control systems. Prerequisites: ENGR 421, ENGR 212, REE 253 or MET 326		
201401	N	ENV	214	Watershed Science & Technology	2-3-3	Science and technology of watershed processes, monitoring, and assessment. Applications and case studies focused on sustainable management and restoration of water resources and their associated aquatic, riparian, and upland ecosystems. Local and regional sites of interest are highlighted. Prerequisite(s): BIO 111 or GEOG 105, or instructor consent		
201401	N	ENV	224	Scientific Reasoning and Methodology	3-0-3	Fundamental principles and practices of scientific reasoning and methodology, including contrasts with other ways of making knowledge, the power of questions, theories versus hypotheses, understanding experiments, supporting claims, drawing inferences, reproducibility, and coping with uncertainty in typical uncontrolled natural experiments. Prerequisite(s): BIO 111 or GEOG 105, or instructor consent		
201401	D	ENV	225	Ecological Assessment of Riparian Ecosystems	1-3-2			

201401	N	ENV	226	Environmental Data Analysis	2-3-3	Introduction to compilation, manipulation, and analysis of datasets common to environmental analysis. Includes measures of central tendency and spread; characterizing data distribution; linear regression; exceedance probability and cumulative frequency functions; understanding time series; and basic principles of graphical data displays. Prerequisites: BIO 111 or GEOG 105, or instructor consent		
201401	N	ENV	261	Sophomore Project Proposal	2-0-2	Application of scientific reasoning and methodology, including literature survey and review; identification of topics, questions, and hypotheses; and experimental design and methodology. Requires preparation and presentation of a research proposal. Prerequisite: BIO 213 or instructor consent.		
201401	N	ENV	262	Sophomore Project	1-6-3	ENV 262 Sophomore Project (1-6-3) Completion of field, laboratory, or investigative project with agencies, faculty members, or industry. Includes data collection, analysis and presentation of a scientific paper. Prerequisite: BIO 261 or instructor consent		
201401	N	ENV	472	Senior Project Proposal	2-0-2	Application of scientific reasoning and methodology, including literature survey and review; identification of topics, questions, and hypotheses; and experimental design and methodology. Requires preparation and presentation of a research proposal. Prerequisite: ENV 262 or instructor consent.		
201401	N	ENV	473	Senior Project Data Collection	1-6-3	Application of scientific reasoning and methodology, including collection and development of field, laboratory, and/or geospatial data in collaboration with faculty and industry professionals. Required data reporting. Prerequisite: ENV 472.		
201401	N	ENV	474	Senior Project Data Analysis and Presentation	1-6-3	Analysis and presentation of project data, including statistical, graphical, geospatial, and/or other scientific methods. Review, presentation, and manuscript development are required. Prerequisite: ENV 473; BIO 434 or MATH 362; or instructor consent		

201401	M	GEOG	105	Physical Geography	3-3-4	Comprehensive introduction to physical geography, including maps and representation of the earth's surface, the climate system and weather phenomena, plate tectonics, landform evolution and interpretation, and human-landscape interactions. Satisfies lab science.	Title, Description, Lab hours, Credit hours	Satisfies lab science for general education
201401	D	GEOG	115	Physical Geography: Climatology	3-3-4			
201401	M	GIS	103	The Digital Earth	1-3-2	Introduction to digital representation of the features and attributes of our natural world and how these systems portray and solve geospatial problems. Concepts, vocabulary, and use of GIS. Introduction to the use of various 'free-ware' software applications used for geospatial analysis. Prerequisite: none	Description	
201401	M	GIS	205	Data Integration	1-3-2	Construction and use of a data dictionary. Principles of Differential Correction. Importing feature and nonfeature data into a GIS. Data Conversion. Use of hand-held GPS/GIS units. Use of ArcPad™ software. Extensive use and creation of web-based GIS applications and services. Prerequisites: GIS 105 and GME 134.	Description	
201401	M	GIS	306	Geospatial Raster Analysis	3-3-4	Geoprocessing task automation. Manipulation and storage of raster data. Measurement scales. Map algebra. Georeferencing raster datasets. Introduction to 3D, least-cost path and corridor modeling. Distance, surface and density mapping techniques. Local, focal, block, and zonal statistical functions. Viewshed and hydrologic analyses. Prerequisite: GME 134.	Description	
201401	M	GIS	316	Geospatial Vector Analysis I	3-3-4	Coordinates, datums, projections. Advanced editing and annotation techniques. Use of subtypes and domains. Map and geodatabase topology. Advanced overlay and proximity analysis. Linear referencing and dynamic segmentation. Geocoding. Professional map creation skills. GIS project design fundamentals. Creation and use of online GIS resources and applications. Prerequisite: GME 134.	Description	

201401	M	GIS	332	Customizing the GIS Environment I	3-3-4	Customizing geoprocessing workflows with Python. Working with lists, and dictionaries. String manipulation. Branching. Error handling. Working with geometries. Use of cursors to access spatial and non-spatial data. Tool creation. Prerequisites: GIS 316 and MIS 118	Description and Prerequisite Change	
201401	M	GIS	426	Geospatial Vector Analysis II	3-3-4	Geocoding. Advanced geospatial analysis. Spatial adjustment techniques. Extensive use of subtypes, domains, validation rules, and cardinalities. Use and creation of directed and undirected networks for geospatial analysis. Routing. Conflation. Quantitative assessment of geographic patterns and distributions. Use of automated geoprocessing techniques. Prerequisite: GIS 316	Description	
201401	M	GIS	432	Customizing the GIS Environment II	3-3-4	Creation and management of Add-Ins. Building and deploying stand-alone GIS applications. Introduction to the server environment. Extensive use of JavaScript for creating web applications and services. Prerequisite: GIS 332	Description	
201401	M	GIS	446	GIS Database Development	3-3-4	Advanced geodatabase design. Import and export of XML. Extensive use and creation of relationship classes. Study, use, design, and creation of data models. Prerequisites: GIS 426 and MIS 275	Description	
201401	M	GIS	456	GIS Web Services and Management	3-0-3	Implementation of a GIS. Definition of information products. Discussion of the server-client relationship. Server site configuration and administration. Sharing GIS content on the web. Building web applications and services. Prerequisites:GIS 446 and GIS 432	Title, Description, and Prerequisite Change	
201401	M	GME	134	Geographic Information System	1-6-3	Coordinate systems. Creating, editing, and querying feature and attribute data. Symbolizing, classifying, and labeling features. Creating and using tabular relationships. Use of raster data, analyzing raster surfaces. Data conversion. Use of web-based GIS applications and services. Extensive use of ArcGIS™ software. Prerequisite: CE 203 or GIS 103.	Description	

201401	M	GME	468	Geomatics Practicum	1-9-4	Students design and complete a Geomatics project. Students demonstrate ability to work independently. Projects are under the supervision of faculty members and comply with any related state statutes and local ordinances. Prerequisites: GME 452 and GME 454 or GME 455.	Description and Prerequisite Change	
201401	N	HIST	275	Introduction to the History of Medicine	3-0-3	Introduction to the history of medicine, with a focus on American medicine in the 19th and 20th centuries. Topics include medical professionalization, the social, technological and economic structure of the medical industry, and medicine in popular culture.		
201401	N	HUM	105	Introduction to Cultural Studies	3-0-3	Course serves as an introduction to the methods of literary analysis and cultural studies. Methods will be applied to various media, including literature, visual art, film, the graphic novel, and video games.		
201401	M	HUM	147	Western Culture in the Classical Age	3-0-3	Study of the ideas and values from the classical period which have profoundly influenced Western culture. Readings and discussion will focus on arts, literature, and philosophy.	Title and Description	
201401	M	HUM	149	Western Culture in the Modern Age	3-0-3	Study of the ideas and values from the Age of Enlightenment to today which have profoundly influenced Western Culture. Readings and discussion will focus on arts, literature, and philosophy.	Title and Description	
201401	M	HUM	225	Contemporary Theater: Ashland Plays	3-0-3	Contemporary live drama viewed at Ashland Shakespearean Festival Theater. Review and analysis of original script prior to play experience. Post review and analysis of play performance, content: plot, character, diction, melody, spectacle.	Description Change	
201401	N	HUM	245	Digital Diversity	3-0-3	A cultural studies approach to internet culture, this course considers online identity construction, the worldwide technological access gap, social media as a mechanism for political revolution, and race/class/gender bias in virtual communities.		
201401	N	HUM	335	Video Game Studies	3-0-3	Students will read essays and criticism about video games, including traditional console and PC games, “serious games,” and social-media-powered games. If possible, some assignments will also involve playing the games we discuss. Prerequisites: WRI 121 or WRI 122		

201401	M	HUM	148	Western Culture in the Medieval Age	3-0-3	Study of the ideas and values from the early Medieval to the Renaissance period which have profoundly influenced Western culture. Readings and discussion will focus on arts, literature, and philosophy.	Title and Description	
201401	D	MATH	102	Accelerated Algebra/Trigonometry	4-0-4	The study of vectors and matrices in Euclidian space, their geometric interpretations and application to systems of equations. Includes linear independence of vectors, basis and dimension, introduction to linear transformations, eigenvalues and eigenvectors, diagonalization, determinants.		
201401	M	MATH	362	Statistical Methods II	4-0-4	Review of inferential statistics, analysis of variance one factor and two factor, simple and multiple regression, analysis of categorical data using tests and confidence intervals for proportions and chi-square tests, correlation, goodness of fit, non-parametric tests. Data sets used will come from various fields including: business, psychology, biology, environmental science, engineering, manufacturing and communication. Prerequisite: MATH 361 or instructor consent.	Description Change	removal of logistic regression
201401	N	MATH	411	Topics in Complex Analysis	4-0-4	Complex numbers and functions, differentiation and integration, Cauchy's theorem and integral formula, Taylor and Laurent series, Residue theorem. Prerequisite: Math 254N		
201401	D	MATH	425	Vector Analysis	3-0-3			
201401	M	MECH	436	Classical Control Systems	2-3-3	An introduction to control systems. Both classic control theory and programmable logic controllers are considered. Topics include block diagrams, mathematical models, transfer functions, LaPlace transforms, frequency responses along with control components and PLC programming. Prerequisites: MECH 318, MECH 480.	Title	

201401	M	MECH	480	Mechanical Vibrations	2-3-3	An introduction to mechanical vibration. Topics include the equations of motion, resonant frequencies, mode shapes, damping and applications. The laboratory will introduce vibration instrumentation. Prerequisites: ENGR 212, ENGR 266, MATH 321, MECH 315, MECH 363.	Title	
201401	M	MGT	335	Project Management	3-0-3	Advanced application of the Critical Path Method to organization and control of project implementation. Applications software will be used to create and evaluate project networks and to develop management. Prerequisite BUS 215 or BUS 304 or BUS 317 or MET 112	Prerequisite, lecture hours, lab hours, number change	
201401	N	MGT	421	Quality Management	3-0-3	Qualitative and quantitative methods of quality assurance in manufacturing and service industries. Assessing quality systems using the ISO 9000 series of standards. Application of basic statistical techniques including control charts, samling procedures, and graphical analysis to assess quality performance. Use of computing systems in establishing quality assurance. Prerequisite MATH 361		
201401	N	MGT	422	Materials Management	3-0-3	Approaches to materials management common to production and service industries. Demand forecasting, inventory management, scheduling, requirements planning and capacity planning using qualitative and quantitative methods. Application of computing systems in materials management processes. Prerequisite: MGT 321		
201401	N	MGT	423	Logistics Management	3-0-3	Approaches to warehousing practices and distribution of goods and services across the supply chain. Warehouse justification and decisions. Procurement, packaging, handling, transport and ownership arrangements. Relationship management, sustainability and risk assessment. Prerequisite: MGT 322		

201401	M	MGT	463	Lean/Six Sigma Management III	3-0-3	Overview course of Six Sigma management roles, responsibilities and terminology. Students will understand the tools and the phases of the DMAIC model and explore business cases to understand how Six Sigma techniques are applied to business. Prerequisite: MATH 361.	Description Change	
201301	**M**	**MIS**	**341**	**Relational Database Design I**	3-3-4	A comprehensive study of SQL and TSQL using the SQL Server relational database management system. Hands-on training will include the use of TSQL, SQL Server Management Studeio, database creation, CLR, data queries, view definitions and use, operators and functions, triggers, calculations, indexing, cursors and data manipulation. Prerequisites: CST 311 or MIS 275, and MATH 111 with grade "C" or better.	**Prerequisite Change**	
201401	M	MIS	341	Relational Database I	3-3-4	A comprehensive study of SQL and TSQL using the SQL Server relational database management system. Hands-on training will include the use of TSQL, SQL Server Management Studeio, database creation, CLR, data queries, view definitions and use, operators and functions, triggers, calculations, indexing, cursors and data manipulation. Prerequisites: MIS 118 with a "C" or better and MIS 275 with a "C" or better	Prerequisite	
201401	N	MIS	446	Data Mining	2--3--3	Defining the project cycle of data mining through data collection, analysis and assessment. Classification, Clustering, Association, Regression, Forecasting, Sequence Analysis and Deviation Analysis are applied to the project life cycle of data mining applications. Prerequisites: MIS 344 and MIS 334 both with a "C" or better		

201401	M	MIS	496	Senior Project Management	2--2--3	Focuses on project management. Includes best- known industry practices, as well as planning, organizing and managing resources to bring about successful completion of specific project goals and objectives. Produces formal proposal for Senior Project. Prerequisite MIS 495 with grade "C" or better.	Credit hour reduction and change in prerequisites	
201401	N	MIS	334	Business Analytics	4-0-4	Understanding of Descriptive, Predictive and Prescriptive Analytics. Regression, Forecasting, Simulation, Sampling and Optimization in relation to business application. Introduction to Data Mining Algorithms are also covered. Prerequisite MATH 362		
201401	N	MIS	495	Senior Project Selection	1-0-1	Selection of the senior project capstone project concept that meets industry demands and stakeholders re-quirement. Prerequisite: MIS 322 with a "C" or better or advisor's consent.		
201301	N	MIT	209	PACS I: Intro to Picture Archiving Communications System	3-0-3	An introduction to Picture Archiving Communications System (PACS). PACS Workflow within the department and interdepartmentally, PARCA and CIIP certification, procurement, and PACS system administration.		
201301	N	MIT	219	PACS II: PACS Communication and Administration	3-0-3	Study of policies and procedures for PACS. Observation of the healthcare organizatio and PACS role within the organization. Overview of PACS components, image acquisition, viewing of images, and image archiving.		
201301	N	MIT	229	PACS III: PACS Technical Requirementsand Image Quality	3-0-3	Overview of computer basics, technical requirements, and Operating System basics. An introduction to HIPAA and PACS image quality.		

201301	N	MIT	239	PACS IV: PACS Implementation and System Management	3-0-3	Overview of implementingt PACS. Starting from procurement to the Return of Investment (ROI). This will include the proposal, approval process, integration, a post install. Class will include the study of DICOM and HL7		
201301	N	MIT	249	PACS V: DICOM	3-0-3	Study of DICOM standard and how it allows for modalities to communicate inside and outside of a facility		
201301	N	MIT	259	PACS VI: PACS Security	3-0-3	Overview of Information Technology, IHE, security, structured reporting and networking fundamentals.		
201301	D	MIT	260	Introduction to PACS				
201301	D	MIT	333	HIPAA for PACS/HI				
201301	D	MIT	361	Advanced PACS				
201301	D	MIT	362	PACS Networking				
201301	D	MIT	363	PACS DBMS				
201301	D	MIT	374	Quality Assurance of Medical Images				
201401	N	PHIL	105	Introduction to Ethics	3-0-3	Students will become familiar with Kant's moral theory and Utilitarianism and use them to examine the morality of abortion, factory farming, and famine relief, among others. Students will learn how to make rational moral judgments. Prerequisite: WRI 122 or WRI 227		
201401	N	PHIL	205	Introduction to Logic	3-0-3	This course prepares students to critique and assess arguments according to the rules of logic. Students will learn formal and informal methods for assessing deductive, inductive, abductive arguments. Logic is useful for all majors because everything you learn at OIT is based on arguments.		
201401	N	PHIL	215	Ethical Theory	3-0-3	Students will become familiar with some plausible moral theories: Kant's moral theory, Aristotle's moral theory, Utilitarianism, The Social Contract, Feminist Ethics and with some more controversial moral theories: Cultural Relativism, Divine Command Theory, Natural Law Theory, Emotivism. Prerequisite: WRI 122 or WRI 227		

201401	N	PHIL	305	Medical Ethics	3-0-3	Students will become familiar with Kant's moral theory and Utilitarianism and use them to examine the morality of abortion, paternalism, allocation of medical resources, and the right to die, among others. Students will learn how to make rational moral judgments. Pre-requisites: WRI 122 and junior standing.		
201401	N	PHIL	315	The Ethics of Emerging Technology	3-0-3	In this course we will become familiar with genetic engineering, geoengineering and cognitive enhancement and examine the moral status of each. This course will provide you with the critical thinking skills to make rational ethical decisions concerning emerging technologies. Prerequisite: WRI 122 or WRI 227		
201401	N	PHIL	325	Environmental Ethics	3-0-3	Students will become familiar with influential moral theories, including those of Kant and Aristotle and Utilitarianism. Possible topics include: What is nature? Do we have a moral obligation to restore ecosystems? If we have moral obligations to nature, on what grounds? Prerequisite: WRI 122 or WRI 227		
201401	N	PHIL	335	Philosophy of Science	3-0-3	What is the difference between science and pseudoscience? What is a scientific explanation? What is a law of nature? Is science objective or value-laden? In this course, students will engage with these and other fundamental topics in philosophy of science. Prerequisite: WRI 122 or WRI 227		
201401	N	PHIL	405	Advanced Logic	3-0-3	This course will build off the foundation of Phil 205. Students will deepen their understanding of sentential logic and will learn about predicate logic. We will also prove that both formal systems are sound and complete. Prerequisite: Phil 205.		
201401	N	PHY	448	Geometric Optics	3-3-4	Reflection and refraction at plane and curved surfaces; imaging properties of lenses; first-order Gaussian optics and thin-lens system layout; matrix optics; ray-tracing software; spherical and chromatic aberrations. Prerequisite: PHY 223		cross listed with EE 448

201401	N	PHY	449	Waveguides and Fiber Optics	3-3-4	Fundamentals of radiometry and photometry; detection of light using thermal and photon (photoemissive, photoconductive, and photovoltaic) methods; noise processes; blackbodies; charge transfer devices; spectroradiometry. Prerequisite: PHY 223, EE 223		cross listed with EE 449
201401	N	PHY	450	Physical Optics	3-3-4	Spherical and planar waves; scalar diffraction theory; Fresnel and Fraunhofer diffraction and application to measurement; interference and interferometers; optical transfer functions; coherent optical systems and holography. Prerequisite: PHY 223		cross listed with EE 450
201401	N	PHY	451	Lasers	3-3-4	Laser radiation properties, laser cavities, coherence, atomic spectra, pumping rate, power gain, threshold conditions, beam shape, mode structure; ion, molecular, solid-state, dye, semiconductor, and fiber lasers. Prerequisites: EE 450 or PHY 450		cross listed with EE 451
201401	N	PHY	452	Waveguides and Fiber Optics	3-3-4	Light propagation in fibers and waveguides; termination, coupling, and splicing of fibers; fiber optic communication; optical time domain reflectometry, fiber amplifiers, and fiber sensors. Prerequisites: EE 450 or PHY 450		cross listed with EE 452
201401	N	PHY	453	Optical Metrology	3-3-4	Modern optical metrology with emphasis on non-destructive testing; Fourier optics; Moiré and polarization methods; classic and holographic interferometry; speckle techniques; fringe analysis. Prerequisites: EE 450 or PHY 450		cross listed with EE 453
201401	N	PSY	441	Youth Mentorship I	2-3-3	Applied learning experience working with youth. Enrolled students are engaged as mentors for youth, utilizing skills in guiding social, academic, emotional, and cognitive development. May be repeated for credit. Prerequisite: Instructor approval required		

201401	N	PSY	442	Youth Mentorship II	2-3-3	Applied learning experience working with youth; continuation from PSY 441. Enrolled students are engaged as mentors for youth, utilizing skills in guiding social, academic, emotional, and cognitive development. May be repeated for credit. Prerequisites: PSY 441 and Instructor approval required		
201401	N	PSY	443	Youth Mentorship III	2-3-3	Applied learning experience working with youth; continuation from PSY 442. Enrolled students are engaged as mentors for youth, utilizing skills in guiding social, academic, emotional, and cognitive development. May be repeated for credit. Prerequisites: PSY 442 and Instructor approval required		
201401	N	PSY	500	Lifespan Development	3-0-3	Study of priniciples of human development with emphasis on the contributions of biological, social, psychological, and multicultural influences as applied to an understanding of cognitive, emotional, social, and physical development across the lifespan.		
201401	N	PSY	505	Law, Ethics & Professional Development	3-0-3	Examines all aspects of therapy that involve statutes, regulations, principles, values and ethics of Marriage and Family Therapists with a special emphasis o the legal and ethical considerations of marriage and family therapy.		
201401	N	PSY	512	Systems Theory	3-0-3	In-depth analysis of Systems Theory in family dynamics. Emphasis placed on structural, strategic, and solution focused applications to counseling.		
201401	N	PSY	513	Couples Theory	3-0-3	Overview of the fundamental theoretical foundations of couples therapy, including systemic, communication, interactional theories of behavior as it relates to couples. Prerequisie: PSY 512		
201401	N	PSY	521	Individual Counseling Techniques	3-0-3	Evidence-based counseling interventions including theory and application from the primary schools of psychotherapy including cognitive-behavioral, systems theory, and humanistic. Prerequisite: PSY 505		
201401	N	PSY	522	Individual Counseling Techniques II	3-0-3	Advanced evidence-based counseling interventions including application of interventions from the primary schools of psychotherapy including cognitive-behavioral, systems theory, and humanistic. Prerequisite: PSY 521		

201401	N	PSY	525	Family Therapy I	3-0-3	Examines theories and techniques of family therapy including various models of family therapy. This course will offer opportunities for practice of the techniques through role playing and review of therapy sessions. Prerequisite: PSY 512		
201401	N	PSY	526	Couples Therapy	3-0-3	Examines issues related to therapeutic theories and treatment strategies with couples, including marriage, partnership, divorce, parenting and remarriage. Prerequisite: PSY 513		
201401	N	PSY	530	Research Methods	3-0-3	Fundamentals of methods for conducting research including experimental designs and non-experimental designs. Includes program evaluation, clinical studies, ethics, and statistical analysis. Emphasis on ability to critically evakluate research studies and provide a foundation for conducting research. Prerequisite: Undergraduate statistics class with a C or better		
201401	N	PSY	535	Treating Diverse Populations	3-0-3	Examines the cultural context of relationships, issues, trends in a diverse society, including culture, ethnicity, nationality, age, gender, sexual orientation, spirituality, religion, larger system and social context. Strengths and limitations of models of treatment as they relate to a different cultural, economic and ethnic groups. Prerequisite: PSY 505		
201401	N	PSY	565	Group Counseling	3-0-3	Theoretical understanding of group dynamics and group process. Evidenced based group interventions for psychoeducational and process groups. Prerequisite: PSY 522		
201401	N	PSY	566	Child & Adolescent Therapy	3-0-3	Specific emphasis on treatment of children and adolescents. Course materials will cover a variety of childhood disorders and evidence-based interventions including individual and family interventions. Prerequisites: PSY 500, PSY 521		
201401	N	PSY	575	Treatment of Substance Abuse	3-0-3	Overview of assessment and treatment of substance disorders including cognitive be-havioral, group and family interventions. Prerequisite: PSY 521		
201401	N	PSY	598	Practicum	4-0-4	Supervised practical experience across one practicum experience utilizing role playing, co-therapy and videotaping. Prerequisite: Approval of internship coordinator		

201401	N	PSY	599	Internship	8	Supervised practical experience across 3 terms for a total of 700 hours in preparation for supervised practice, 280 of direct client contact and the remaining hours in supervisory and training activities and administrative duties related to the profession. Prerequisite: Approval of internship coordinator		
201401	M	REE	243	Electrical Power	3--3--4	Fundamentals of electrical power; three-phase power systems, power factor, harmonics, resonance, PF correction. Electrical power systems: power transformers; transmission lines, distribution and transmission, HVAC and HVDC. Power systems representation: single-line diagrams, per-unit representation. Symmetric and asymmetric faults. Power flow analysis. Prerequisites: EE 223; MATH 252; PHY222	Prerequisite Change	Added PHY requirement
201401	M	REE	253	Electromechanical Energy Conversion	2--3--3	Motoring and generating principles for Direct Current, Synchronous, and Induction Machines. Magnetic Circuits Review. EE 223; MATH 252; PHY 222	Title, Description, and Prerequisite Change	
201401	M	REE	347	Hydroelectric Power	3-0-3	Introduction to hydro-resource power production. Hydro-power in history. Physics of hydrology. Power, head, flow-rate. Turbine hydrodynamics; Francis, Kaplan, Pelton, Turgo, cross-flow. System components: generators, governors, penstocks, spillways, valves, gates, trashracks. Large-scale and microhydroelectric systems. Pumped storage. Economic, environmental considerations. Prerequisites: MECH 318.	Prerequisite Change	Removed MECH 326 and REE 253 as a prerequisite.
201401	M	REE	413	Elecetric Conversion Systems	2--3--3	Power electronics devices in renewable energy applications, including converters and controls. Project integral to class. Prerequisite: EE 419	Description Change	
201401	N	REE	425	Electricity Markets and Modeling	3-0-3	Introduction to restructured electricity markets. Students gain knowledge of theory, structures, successes and failures of markets, market participant behavior, risk, and uncertainty, and basic simulation and optimization modeling for market analyses. MATH 111 and ECO 201 or ECO 202		

201401	N	REE	431	Geothermal Heat Pump Design	3-0-3	Theory/design of geothermal heat pump applications, emphasis ground heat exchanger simulation and design. Closed-loop, open-loop, and hybrid geothermal heat pump systems will be examined. Exposure to the development and use of geothermal design and simulation tools. Prerequisite: MECH 323		
201401	M	REE	451	Geothermal Energy and Direct Use Applications	3-0-3	Introduction to basic geothermal energy sources and generation. Basic geothermal energy applications including direct use, heat pumps and power generation. Geothermal reservoir, site analysis, exploration and drilling. Direct use application system design (HVAC) and equipment. Prerequisite: ENGR 355 Thermodynamics	Title, Description, Prerequisite changes	
201401	N	REE	471	Geothermal Power Plant Design	3-0-3	Introduction to geothermal reservoir pressure, temperature and flow models and analysis. Basic geothermal power plant equipment and design for dry steam, single/double flash and binary cycle power plants. Plant thermodynamic analysis/efficiency using Rankine/Kalina cycles. Plant environmental, economic and social impacts. Prerequisite: MECH 323 Heat Transfer.		
201401	N	REE	581	Energy Storage Fundamentals				
201401	N	REE	581	Energy Storage Fundamentals	3-0-3	The survey course will examine energy storage fundamentals; applications and trends for pumped hydro, compressed air, flywheels, superconducting magnetic energy storage, gravitational mass, super-capacitors, batteries, fuel cells, and thermal systems.		
201401	N	REE	582	Introduction to Batteries	3-0-3	The course provides introduction to field of batteries and discusses electrochemical fundamentals and general properties of batteries such as energy density, specific power, charging and discharging, temperature effects, aging, and self-discharge.		

201401	N	REE	583	Introduction to Fuel Cells	3-0-3	This overview course will introduce students to fundamental fuel cell principles, history, classification, thermodynamics, efficiency and causes of voltage losses, reaction kinetics, electrode performance and catalyst design, and fuel cell components and their impact on performance.		
201401	N	REE	591	Hydrogen Production and Storage	3-0-3	The course will discuss the basics of hydrogen production and storage, the concept of hydrogen economy, conventional hydrogen generation, electrochemical and photochemical technologies, principles of hydrogen storage and novel storage materials.		
201401	N	REE	592	Advanced Batteries	3-0-3	This course will examine technology and trends in battery chemistry, manufacturing, pack assembly, characterization, safety, economics and applications for battery systems including lead acid, nickel-based, lithium ion, lithium polymer, metal air and flow batteries.		
201401	N	REE	593	Advanced Fuel Cells	3-0-3	This course provides an in-depth analysis of the current trends, fuel processing, novel materials, applications, safety, and characterization for polymer electrolyte membrane, alkaline, phosphoric acid, molten carbonate, solid oxide, and direct methanol fuel cells.		
201401	N	SOC	201	Classical Sociological Theory	3-0-3	Introduction to the early development of sociological theory. Works by Marx, Weber, Durkheim, Parsons and Goffman will be discussed in terms of their contribution to the discipline of sociology.		
201401	N	SOC	202	Contemporary Sociological Theory	3-0-3	Theories on the social construction of self, social and population structures, gender inequality, global capitalism and deviance are explored in the context of contemporary social issues. Prerequisite: SOC 201		
201401	N	SOC	205	Current Health Issues	3-0-3	An introduction to the most pressing health issues in contemporary society, including aging, healthcare reform, cost of healthcare, and amenable mortality.		
201401	N	SOC	206	Social Problems	3-0-3	A sociological exploration of contemporary social problems, including crime, illness, poverty, unemployment, immigration, gender inequality, LGBT issues, and the environment. Prerequisite: SOC 204.		

201401	N	SOC	301	Social Science Research Methods	3-3-4	Introduction to theory and methods of research in the social sciences, and interpretation of social science research. Prerequisites: SOC 204, SOC 225		
201401	N	SOC	302	Social Science Research Methods II	3-3-4	Continuation of SOC 301 Social Science Research Methods: data collection, analysis, and development of social science research papers. Prerequisite: SOC 301		
201401	N	SOC	315	Juvenile Delinquency	3-0-3	Introduction to trends and sociological theories of juvenile delinquency. Prerequisite: SOC 204.		
201401	N	SOC	405	Program Planning and Evaluation	3-0-3	In this course, health behavior and behavior change theories are introduced, critiqued, and utilized to provide theory-based examples of population health interventions. Prerequisites: SOC 204, SOC 225		
201401	N	SOC	421	Senior Project Preparation	2-0-2	Selection of senior capstone research project and/or selection of externship site and goals for externship experience that meets industry needs. Prerequisite: Population Health Management majors with senior status only.		
201401	M	VAS	337	Survey of Echocariography	2-3-3	A survey of basic echocardiography with emphasis on normal cardiac anatomy and abnormal disease states. Standard sonographic imaging techniques of adult echocardiography, including instrumentation and protocols. Prerequisite: BIO 220.	Prerequisite, lecture hours, and lab hours change	
201401	M	VAS	375	Survey of Abdominal Sonography	3-0-3	A survey of basic abdominal sonography with emphasis on normal abdominal anatomy and abnormal disease states. Standard sonographic imaging techniques of general abdomen, instrumentation, and abdominal protocols. Corequisite: VAS 365.	Prerequisite Change	
201401	N	WRI	521	Writing at the Graduate Level	3-0-3	Focuses on developing professional-level writing skills to produce a master's thesis/project documentation. Includes structure, methodology, and emphasizes adherence to OIT manual and appropriate reference style. By end of term, students will have written a detailed prospectus and literature review.		