

## Suggested Elective Courses : 2018/2019

<b>Biological Engineering Electives (minimum of 9 credits required)</b>			
Emphasis	Course #	Course Name	Prereqs
Biomedical	BE 361	Transport Processes in Biological Systems (3 cr)	ENGR 320, ENGR 335
Biomedical	BE 404	Special Topics (credit arranged)	See Instructor
Biomedical	BE 404	Biomechanics of Hard and Soft Tissues (3 cr)	Junior or Senior standing; or Instructor Permission
Biomedical	BE 404	Tissue Engineering and Regenerative Medicine (3 cr)	Junior or Senior standing; or Instructor Permission
Biomedical	BE 404	Medical Imaging: Techniques and Applications (3 cr)	Junior or Senior standing; or Instructor Permission
Biomedical	BE 404	Neural Engineering (3 cr)	Junior or Senior standing; or Instructor Permission
Biomedical	BE 421	Image Processing and Computer Vision (3 cr)	BE 242, MATH 275, or permission
Biomedical	BE 499	Directed Study (credits arranged)	See Instructor
Environmental	BE 404	Special Topics (credit arranged)	See Instructor
Environmental	BE 404	Plasma Technologies for Biosystems and Environment (2 cr)	see instructor
Environmental	BE 411	Energy and Environmental Auditing (3 cr)	ENGR 240, ENGR 320, or Permission
Environmental	BE 421	Image Processing and Computer Vision (3 cr)	BE 242, MATH 275
Environmental	BE 433	Bioremediation (3 cr)	BIOL 115, BIOL 115L, MATH 170, or Permission
Environmental	BE 453	Northwest Climate and Water Resources Change (3 cr)	STAT 301 or Permission
Environmental	BE 485	Fund. of Bioenergy & Bioproducts (3 cr)	CHEM 111, ENGR 320 or permission
Environmental	BE 492	Biofuels (3 cr)	CHEM 111, ENGR 320 or permission
Environmental	BE 494	Thermochem Tech for Biomass (3 cr)	CHEM 277/278, ENGR 320 or permission
Environmental	BE 499	Directed Study (credit arranged)	See instructor

<b>Engineering Electives</b>			
Emphasis	Course #	Course Name	Prereqs
Biomedical	CHE 404	Microtech Medical Diagnostics (3 cr)	See Instructor
Biomedical	CHE 404	Modeling and Control of Biochemical and Neuronal Systems (3 cr)	See Instructor
Biomedical	CHE 460	Biochemical Engineering (3 cr)	See Instructor
Biomedical	ECE 404	Deep Learning and Spiking Neural Networks (3 cr)	See Instructor
Biomedical	ENGR 220	Engineering Dynamics (3 cr)	ENGR 210
Biomedical	ENGR 428	Numerical Methods (3 cr)	MATH 310
Biomedical	ME 301	Computer Aided Design Methods (3 cr)	ME 223
Biomedical	ME 313	Dynamic Modeling of Engineering Systems (3 cr)	ME 223, ENGR 220, ENGR 240, MATH 310
Biomedical	ME 404	Assistive Robotic Technologies (3 cr)	See Instructor
Biomedical	ME 423	Human Factors and Ergonomics in Product Design (3 cr)	Senior Standing or permission
Biomedical	ME 450	Computational Fluid Dynamics (3 cr)	ENGR 335 and MATH 330
Biomedical	MSE 412	Mechanical Behavior of Materials (3 cr)	MSE 201 and Junior Standing, or permission
Environmental	CE 211	Engineering Surveying (3 cr)	MATH 170, ENGR 105
Environmental	CE 322	Hydraulics (3 cr)	CE 215, MATH 310, PHYS 211/lab, ENGR 220, 335
Environmental	CE 325	Funds of Hydrologic Engineering (3 cr)	MATH 310, STAT 301, and ENGR 335
Environmental	CE 330	Funds of Environmental Engineering (3 cr)	ENGR 335, CHEM 111, CE 215, and MATH 310
Environmental	CE 421	Engineering Hydrology (3 cr)	CE 325
Environmental	CE 422	Hydraulic Structures Analysis and Design (3 cr)	CE 322, ENGR 360, or Permission
Environmental	CE 428	Open Channel Hydraulics (3 cr)	Recommended Preparation: CE 322.
Environmental	CHE 460	Biochemical Engineering (3 cr)	
Environmental	CHE 490	Hydrogen Energy Systems	Senior standing
Environmental	ENGR 220	Engineering Dynamics (3 cr)	ENGR 210
Environmental	ENGR 428	Numerical Methods (3 cr)	MATH 310
Environmental	ME 301	Computer Aided Design Methods (3 cr)	ME 223
Environmental	ME 414	HVAC Systems (3 cr)	ME 345, 444
Environmental	ME 420	Fluid Dynamics (3 cr)	ENGR 335, MATH 310 or Permission
Environmental	ME 435	Thermal Energy Systems Design (3 cr)	ME 345
Environmental	ME 436	Sustainable Energy Sources and Systems (3 cr)	ME 345
Environmental	ME 438	Sustainability and Green Design (3 cr)	MATH 310
Environmental	ME 444	Air Conditioning Engineering (3 cr)	ME 345
Environmental	ME 450	Computational Fluid Dynamics (3 cr)	ENGR 335 and MATH 330

Technical/Science Electives			
Emphasis	Course #	Course Name	Prereqs
Biomedical	AVS 567	Advanced Physiology (4 cr)	Senior standing, GPA over 3.0; Recommended prep: undergraduate physiology, biology, cell biology, and/or biochemistry
Biomedical	BIOL 114	Organisms and Environments (4 cr)	N/A
Biomedical	BIOL 120	Human Anatomy (4 cr)	N/A
Biomedical	BIOL 121	Human Physiology (4 cr)	BIOL 120
Biomedical	BIOL 213	Biological Structure and Function (4 cr)	BIOL 115, BIOL 115L
Biomedical	BIOL 310	Genetics (4 cr)	BIOL 115 and BIOL 115L or BIOL 250
Biomedical	BIOL 312	Molecular and Cellular Biology (3 cr)	BIOL 115, BIOL 115L
Biomedical	BIOL 324	Comparative Vertebrate Anatomy (4 cr)	BIOL 114 and BIOL 115, BIOL 115L and BIOL 213; or Permission
Biomedical	BIOL 428	Microscopic Anatomy (4 cr)	BIOL 213 or BIOL 312
Biomedical	BIOL 432	Immunology (3 cr)	BIOL 300 or BIOL 380
Biomedical	BIOL 433	Pathogenic Microbiology (3 cr)	BIOL 250
Biomedical	BIOL 444	Genomics (3 cr)	BIOL 114 and BIOL 310; or BIOL 250
Biomedical	BIOL 447	Virology (3 cr)	BIOL 312 or Permission
Biomedical	BIOL 454	Biochemistry II	CHEM 372; BIOL 380 or CHEM 302 or 306; or Permission
Biomedical	BIOL 461	Neurobiology (3 cr)	BIOL 213, BIOL 310, BIOL 312, GENE 314, BIOL 300, or BIOL 380
Biomedical	BIOL 474	Principles of Developmental Biology (3 cr)	BIOL 114 and BIOL 115, BIOL 115L; or BIOL 312
Biomedical	BIOL 482	Protein Structure and Function (3 cr)	BIOL 380
Biomedical	BIOL 487	Eukaryotic Molecular Genetics	BIOL 380; and BIOL 310 or GENE 314
Biomedical	CHEM 372/4	Organic Chem II/ Lab (3+1cr)	CHEM 277/CHEM 278
Biomedical	CHEM 472	Medicinal Chemistry (3 cr)	CHEM 473, CHEM 476 or Permission
Biomedical	GENE 314	General Genetics (3 cr)	BIOL 115 or BIOL 154 or Permission
Biomedical	GENE 440	Advanced Laboratory Techniques (4 cr)	BIOL 250
Biomedical	GENE 488	Genetic Engineering (3 cr)	GENE 314 or BIOL 310
Biomedical	MATH 330	Linear Algebra (3 cr)	MATH 160 or MATH 170
Biomedical	MATH 430	Advanced Linear Algebra (3 cr)	MATH 215 and MATH 330 or Permission
Biomedical	MATH 437	Mathematical Biology (3 cr)	MATH 310 or permission
Biomedical	MATH 480	Partial Differential Equations (3 cr)	MATH 310 or permission
Biomedical	PEP 300	Appl. Hum. Anat. & Biomechanics (3 cr)	BIOL 120 or permission
Biomedical	PEP 360	Motor Behavior (3 cr)	BIOL 120
Biomedical	PHYS 438	Biological Physics (3 cr)	PHYS 212 or PHYS 213; Junior or Senior standing
Biomedical	PSYC 372	Physiological Psychology (3 cr)	PSYC 101
Biomedical	PSYC 425	Psychology of Action (3 cr)	PSYC 101 and PSYC 218
Biomedical	PSYC 444	Sensation and Perception (3 cr)	PSYC 101 and PSYC 218
Biomedical	PSYC 446	Engineering Psychology (3 cr)	PSYC 101; and PSYC 218 or STAT 301 or Permission
Biomedical	PSYC 452	Ergonomics & Biomechanics (3 cr)	PSYC 101
Biomedical	PSYC 461	Human-Computer Interaction (3 cr)	PSYC 101
Biomedical	STAT 419	Introduction to SAS/R Programming (3 cr)	STAT 251 or STAT 301 or STAT 416
Environmental	ASM 202	Agricultural Shop Practices (2 cr)	Permission required
Environmental	ASM 305	GPS and Precision Agriculture (3 cr)	
Environmental	ASM 315	Irrigation Systems and Water Management (3 cr)	SOIL 205, MATH 108, MATH 143, MATH 160, MATH 170, or Permission
Environmental	ASM 407	Advanced Welding (1 cr)	ASM 107 or Permission
Environmental	ASM 412	Agricultural Safety and Health (2 cr)	
Environmental	CHEM 372/4	Organic Chem II/ Lab (3+1)	CHEM 277
Environmental	ENVS 409	Principles of Environmental Toxicology (3 cr)	Recommended: BIOL 102 or BIOL 115, CHEM 111, CHEM 112, CHEM 275, and STAT 251
Environmental	ENVS 415	Environmental Lifecycle Assessment (3 cr)	
Environmental	ENVS 428	Pollution Prevention (3 cr)	
Environmental	ENVS 429	Environmental Audit (3 cr)	
Environmental	ENVS 436	Principles of Sustainability (3 cr)	Junior or higher standing
Environmental	ENVS 446	Drinking Water and Human Health (3 cr)	
Environmental	ENVS 479	Introduction to Environmental Regulations (3 cr)	
Environmental	ENVS 484	History of Energy (3 cr)	
Environmental	ENVS 485	Energy Efficiency and Conservation (3 cr)	
Environmental	GEOG 385	GIS Primer (3 cr)	
Environmental	GEOG 401	Climatology (3 cr)	
Environmental	GEOG 405	Climate and Water Resources Change (3 cr)	GEOG 401, Stat 251 or Permission
Environmental	GEOG 407	Spatial Statistics and Modeling (3 cr)	STAT 431 or Permission

Environmental	GEOG 424	Hydrologic Application of GIS and Remote Sensing	GEOG 385 or equivalent work experience
Environmental	MATH 330	Linear Algebra (3 cr)	MATH 160 or MATH 170
Environmental	MATH 430	Advanced Linear Algebra (3 cr)	MATH 215 and MATH 330 or Permission
Environmental	MATH 437	Mathematical Biology (3 cr)	MATH 310 or permission
Environmental	MATH 480	Partial Differential Equations (3 cr)	MATH 310 or permission
Environmental	PLSC 300	Plant Propagation(3 cr)	PISC 102, 201, or BIOL 115
Environmental	PLSC 338	Weed Control (3 cr)	PISC 102 or equivalent
Environmental	PLSC 401	Plant Physiology (3 cr)	PLSC 205, Biol 115, Biol 115L, or Permission
Environmental	PLSC 407	Field Crop Production (3 cr)	
Environmental	PLSC 446	Plant Breeding (3 cr)	GENE 314 or equivalent
Environmental	PLSC 476	Cell Biology (3 cr)	BIOL 115 and either BIOL 300 or BIOL 380
Environmental	PLSC 486	Plant Biochemistry (3 cr)	BIOL 300 or BIOL 380
Environmental	PLSC 488	Genetic Engineering (3 cr)	BIOL 380
Environmental	RMAT 321	Properties of Renewable Materials (3 cr)	
Environmental	RMAT 438	Introduction to Lignocellulosic Chemistry (1 cr)	CHEM 101 or 111, and CHEM 275 or 277
Environmental	RMAT 538	Lignocellulosic Biomass Chemistry (3 cr)	Senior standing, GPA over 3.0; CHEM 101 and RMAT 321, and CHEM 275 or 277
Environmental	SOIL 205	The Soil Ecosystem (3 cr)	CHEM 101/ 111
Environmental	SOIL 415	Soil and Environmental Physics (3 cr)	Recommended Prep : Soil 205, 206, and Phys 111
Environmental	SOIL 422	Environmental Soil Chemistry (3 cr)	Recommended Prep : Soil 205, 206, and Chem 112
Environmental	SOIL 425	Microbial Ecology (3 cr)	BIOL 154 or 250
Environmental	SOIL 427	Sustainable Food Systems	For 221, REM 221, or Soil 210; or Permission
Environmental	SOIL 438/PLSC	Pesticides in the Environment (3 cr)	CHEM 275
Environmental	SOIL 450/ENVS	Environmental Hydrology (3 cr)	MATH 170
Environmental	STAT 431	Statistical Analysis (3 cr)	STAT 251, STAT 301 or STAT 416