

Credits: 3. Offered alternate years. Prereq., graduate standing. Broad overview of population and community ecology. Lectures and discussions, introducing theoretic foundations and exploring classic and more recent empirical tests of theory. Level: Graduate

BIOB 507 - OBE Core Course - Organismal Function

Credits: 3. Offered alternate years. Prereq., graduate standing. Exploration of the physical and chemical mechanisms that underlie the relationship between form and function in organisms. Lectures and discussions are pursued using a comparative, ecological and evolutionary framework. Level: Graduate

BIOB 513 - Community Ecology

Credits: 3. Offered alternate years. Prereq., BIOE 370 or equiv., consent of instr. Current concepts of species interactions, succession, food webs, temporal and spatial patterns and quantitative characterization of community structure. Level: Graduate

BIOB 517 - Adv Plant Ecology

Credits: 3. Prereq., upper-division course in ecology or consent of instr. Offered alternate years. Review and discussion of recent advances in plant ecology. Level: Graduate

BIOB 518 - Plant-Consumer Interactions

Credits: 3. Offered alternate years. Prereq. BIOE 370 or equiv. Ecology and evolution of plant-consumer interactions. Review of classic and contemporary literature on plant-consumer interactions. Level: Graduate

BIOB 522 - Rdgs Morph, Phys, and Zool

Credits: 1. (R-8) Prereq., graduate standing and consent of instr. Review and discussion of current literature in the fields of morphology, physiology, and ecology. Level: Graduate

BIOB 524 - Physiological Plant Ecology

Credits: 3. Offered alternate years. Prereq., BIOE 370 and BIOO 433. The physiological basis of plant adaptation and response to the environment. Level: Graduate

BIOB 526 - Trends in Plant Ecology

Credits: 2. (R-16) Prereq., graduate standing. Current concepts, theory, and experiments in plant ecology. Level: Graduate

BIOB 541 - Electron Microscopy Lab

Credits: 1 TO 6. (R-6) Prereq. or coreq., BIOB 440 or equiv. Practical laboratory experience in the preparation of various samples and hands-on operation of the transmission and/or scanning electron microscopes. Level: Graduate

BIOB 547 - Exptl Mol/Cell/Chem Biol

Credits: 1. (R-8) Offered every term. Prereq., graduate standing or consent of instr. Focus on experimental design, methods, and presentation of experimental results for graduate students in laboratories with a molecular, cellular or chemical biological focus. Level: Graduate

BIOB 551 - Environmental Field Study

Credits: 1 TO 3. (R-3) Prereq. or coreq., ENSC 540 or ENST 560. Same as ENSC 551. Designing, executing, and interpreting environmental studies. Project oriented. Level: Graduate

BIOB 561 - Population Genetics Seminar

Credits: 1 TO 2. (R-12) Prereq., consent of instr. or graduate standing. Current topics in population genetics, evolutionary biology, molecular evolution and related topics. Level: Graduate

BIOB 565 - Membrane Dynamics Res Sem

Credits: 1. (R-8) Offered every term. Prereq., graduate standing or consent of instr. Focus on experimental design, methods, and presentation of experimental results for students conducting research in membrane cell biology, including membrane trafficking and intracellular signaling. Level: Graduate

BIOB 594 - Seminar in Biology

Credits: 1. (R-6) Prereq., graduate standing or consent of instr. A review and discussion of current research in biology. Topics vary. Level: Graduate

BIOB 595 - Special Topics

Credits: 1 TO 4. (R-8) Prereq., graduate standing and consent of instr. Experimental offering of new courses by resident or visiting faculty. Level: Graduate Course Attributes: Internships/Practicums

BIOB 596 - Independent Study

Credits: 1 TO 8. (R-8) Prereq., consent of instr. Credit for independent research project unrelated to thesis or dissertation. Level: Graduate Course Attributes: Service Learning/Volunteer

BIOB 597 - Research

Credits: 1 TO 8. (R-12) Prereq., consent of instr. Library work involved with preparation of a thesis or dissertation proposal. Level: Graduate

BIOB 598 - Internship

Credits: 1 TO 8. (R-8) Prereq., consent of the Division, graduate standing. Extended classroom experience that provides practical application of learning during placement off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. Level: Graduate Course Attributes:

Internships/Practicums

BIOB 599 - Thesis

Credits: 1 TO 10. (R-10) Prereq., masters student in biology. Field and laboratory research on, and writing of, a student's master's thesis. Level: Graduate

BIOB 699 - Dissertation

Credits: 1 TO 10. (R-20) Prereq., doctoral student in biology. Credit for field and laboratory research on, and writing of, a student's doctoral dissertation. Level: Graduate

Biology - Ecological

BIOE 172N - Introductory Ecology

Credits: 3. Offered autumn. An introduction to ecological principles, stressing the structure and function of natural communities and examining human's role in these ecosystems. Course Attributes: Natural Science Course

BIOE 342 - Field Ecology

Credits: 5. Offered summers only at Flathead Lake Biological Station. Prereq., BIOB 272 and one year of college math, including statistics. The principles and practices of the study of animals and plants in their

natural environments, including human influences, with focus on the Crown of the Continent area of the Rock Mountains and taught entirely outdoors.

BIOE 370 - General Ecology

Credits: 3. Offered autumn. Prereq., BIOB 272. Analysis of the distribution and abundance of plants and animals. Includes individual, population and community-level processes (e.g., population growth and regulation, competition, predation, succession, nutrient cycling, energy flow and community organization).

BIOE 371 - Gen Ecology Lab (equiv to 271)

Credits: 2. Offered autumn. Prereq. or Coreq., BIOE 370 and either STAT 216 or WILD 240. Methods of describing and testing alternative explanations for patterns in nature. The use of scientific methodology in ecology.

BIOE 394 - Seminar/Workshop

Credits: 2. Offered autumn. Preparatory readings and attendance at seminars on a wide variety of ecological and wildlife management topics followed by critiques.

BIOE 403 - Vert Design & Evolution

Credits: 5. Offered spring. Prereq., BIOB 170N, 171N and 272 and PHSX 205N/206N or 215N/216N.

Evolutionary patterns of animal morphology and the importance of body size on life history patterns.

Phylogenetic study of major extant and extinct vertebrate groups. Laboratory includes systematic study of organ systems and workshops in experimental functional morphology.

BIOE 406 - Behavior & Evolution

Credits: 3. Offered autumn. Prereq., BIOB 272. Diversity of animal behavior in an evolutionary context including inheritance of behavior, diets, avoidance responses, mating systems and sexual selection, parental care, and evolution of animal groups and societies.

BIOE 409 - Behavior & Evolution Discussion

Credits: 1. Offered autumn. Co-req., BIOE 406. Diversity of animal behavior in an evolutionary context including inheritance of behavior, diets, avoidance responses, mating systems and sexual selection, parental care, and evolution of animal groups and societies. This discussion course complements the lectures of BIOE 406 by examining both landmark and recent literature. It also includes a written component.

BIOE 416 - Alpine Ecology

Credits: 3. Offered summers only at Flathead Lake Biological Station. Prereq., BIOE 342 or BIOE 370/371.

Distribution, abundance and life cycles of plants and animals and their unique ecophysiological adaptations to life in the rigorous environments of the high mountains above the timberline, with emphasis on the Crown of the Continent area.

BIOE 428 - Freshwater Ecology

Credits: 5. Offered autumn. Prereq., BIOB 160N and either CHMY 123N or 143N. Physical and chemical dynamics of lakes and streams. Diversity, distribution and dynamics of freshwater organisms.

BIOE 439 - Stream Ecology

Credits: 3. Offered summers only at Flathead Lake Biological Station. Prereq., BIOE 342 or BIOE 370/371, CHMY 121N. The biota and biogeochemical processes of running waters with unifying principles and contemporary research approaches.

BIOE 440 - Conservation Ecology

Credits: 3. Offered summers only at Flathead Lake Biological Station. Prereq., BIOE 342 or BIOE 370/371. Concepts and approaches for sustaining biodiversity and other natural goods and services provided by terrestrial and aquatic systems.

BIOE 447 - Terrestrial Ecosystem Ecology

Credits: 3. Offered alternate years. Prereq., BIOB 160N and any ecology-themed course or consent of instr. Introduction to systems thinking and the ecosystem concept, review of water and energy balance, carbon cycling and production processes, nutrient cycling, trophic dynamics, and species effects on ecosystem functioning.

BIOE 448 - Terrestrial Plant Ecology

Credits: 4. Offered autumn. Prereq., an introductory college course in ecology. The interrelationships between plants and plant communities and their natural environment.

BIOE 449 - Plant Biogeography

Credits: 3. Prereq., consent of instr. Offered alternate years. Description of the distribution of plants and animals at global, continental and regional scales. Analysis of ecological and historical factors influencing distribution and association.

BIOE 451 - Landscape Ecology

Credits: 3. Offered summers only at Flathead Lake Biological Station. Prereq., BIOE 342 or BIOE 370/371. Biophysical processes that determine landscape and ecosystem structure and function using remote sensing tools, geographic information systems and dynamic models to demonstrate landscape change.

BIOE 453 - Ecology of Small & Large Lakes

Credits: 3. Offered summers only at Flathead Lake Biological Station. Prereq., BIOE 342 or BIOE 370/371, CHMY 121N and CHMY 123N. The physical, chemical and biological characteristics of lake ecosystems with an emphasis on nutrient cycling, food web interactions and water quality.

BIOE 458 - Forest and Grassland Ecol

Credits: 3. Offered summers only at Flathead Lake Biological Station. Prereq., BIOE 342 or BIOE 370/371. Patterns and processes of the forests and grasslands of the northern Rocky Mountains in the context of principles of population community and ecosystem ecology.

BIOE 490 - Adv Undergrad Research

Credits: 1 TO 10. (R-10) Offered every term. Prereq., junior or senior standing and consent of instr. Independent research under the direction of a faculty member. Graded credit/no credit.

BIOE 594 - Seminar

Credits: 1 TO 4. (R-12). Offered intermittently. Prereq. graduate standing. Presentations by student, faculty, and associates on issues and topics in their field. Level: Graduate

Biology-Human

BIOH 112 - Human Form and Function I

Credits: 3. Offered autumn. Explores the fundamentals of structure and function at basic cellular and tissue levels, in addition to the anatomy and physiology of the integumentary, musculoskeletal, and nervous systems.

BIOH 113 - Human Form and Function II

Credits: 3. Offered spring. Explores the fundamental structures and functions of the endocrine, cardiovascular, respiratory, digestive, urinary and reproductive systems.

BIOH 191 - Special Topics

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

BIOH 280 - From Molecules to Mind - Fundamentals of Neuroscience

Credits: 3. Course will focus on the molecular and cellular underpinnings of the functions of the brain and nervous system. The topics will range from the basis of electrical and chemical signaling to the organization of the sensory systems and mechanisms involved in learning, memory, and complex behaviors.

BIOH 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.

BIOH 365 - Human AP I for Health Profsns

Credits: 0 TO 4. Offered autumn and summer. Prereq., CHMY 121N or CHMY 141N; BIOB 160N or BIOH 112 or 113. Introduction to basic cellular structure and function. The fundamental facts and concepts of the anatomy and physiology of cells and tissues, the integumentary, musculoskeletal, nervous and special senses with an emphasis on clinical application for students preparing for careers in health care. Laboratory component includes presentation of cadaver prosections and models.

BIOH 370 - Human AP II for Health Profsns

Credits: 0 TO 4. Offered spring. Prereq., BIOH 365. The fundamental facts and concepts of the anatomy and physiology of the endocrine, circulatory, respiratory, digestive, urinary and reproductive systems with an emphasis on clinical application for students preparing for careers in health care. Laboratory component includes presentation of cadaver prosections and models.

BIOH 398 - Internship

Credits: 1 TO 6. Offered intermittently. Prereq., consent of the Division. Extended classroom experience that provides practical application of learning during placement off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation. Course Attributes: Internship graduation limit 6

BIOH 405 - Hematology

Credits: 3. Offered autumn. Prereq., junior level or consent of instr., BIOM 360. Study of blood and diseases of the circulatory system. Blood banking and serology.

BIOH 423 - TA: Form & Function I

Credits: 1 TO 3. (R-4) Offered autumn. Prereq., "A" or "B" in BIOH 112 and 113 and/or one year upper division anatomy and physiology coursework with cadaver lab. Consent of instr. This select group of students teaches regularly scheduled cadaver lab prosection experiences for students enrolled in BIOH 112; assists in

preparation and grading of lecture and laboratory visit teaching materials; and assists with proctoring and grading exams of undergraduate students enrolled in BIOH 112.

BIOH 424 - TA: Form & Function II

Credits: 1 TO 3. (R-4) Offered spring. Prereq., "A" or "B" in BIOH 112 and 113 and/or one year upper division anatomy and physiology coursework with cadaver lab. Consent of instr. This select group of students teaches regularly scheduled cadaver lab prosection experiences for students enrolled in BIOH 113; assists in preparation and grading of lecture and laboratory visit teaching materials; and assists with proctoring and grading exams of undergraduate students enrolled in BIOH 113.

BIOH 456 - Cadaver Dissection I

Credits: 2. Offered autumn. Prereq., "A" or "B" in BIOH 365 and 370 or equivalent with cadaver experience. Consent of instr. This course is a practicum that provides the participant the ability to expand their anatomical knowledge base, professional growth, and public speaking skills. The participant will have the unique opportunity to dissect, within a small group, a region of a cadaver and present visible structures to their peers. The cadavers prepared by these students are used for teaching in DBS A&P offerings. Systems presented in autumn semester include integumentary, musculoskeletal and nervous systems.

BIOH 457 - Cadaver Dissection II

Credits: 2. Offered spring. Prereq., "A" or "B" in BIOH 365 and 370 or equivalent with cadaver experience, and a grade of "A" in BIOH 456. Consent of instr. This course is a practicum that provides the participant the ability to expand their anatomical knowledge base, professional growth, and public speaking skills. The participant will have the unique opportunity to dissect, within a small group, a region of a cadaver and present visible structures to their peers. The cadavers prepared by these students are used for teaching in DBS A&P offerings. Systems prepared and presented in spring semester include endocrine, cardiovascular, lymphatic, digestive, urinary and reproductive.

BIOH 458 - Neuroscience Research

Credits: 4. Prereq., senior standing in Neuroscience. Theory and practical experience in neuroscience experiment design, data collection, results analysis and report creation. Students will generally assist with ongoing research as well as attend formal classroom presentations and discussions. Students will be required to work with the course writing instructor to undertake the writing process and develop a primary literature review, an abstract and final report based on the experiments conducted and the data collected. Students with well-developed research ideas and skills may be allowed to undertake supplemental independent research.

Course Attributes: Writing Course-Advanced

BIOH 461 - Human Anat/Phys I Tutor/Honors

Credits: 3. Offered autumn. Prereq., "A" or "B" in BIOH 365 or equiv. and consent of instr. This select group of students performs tutoring for students enrolled in BIOH 365; assists in preparation and grading of lecture and laboratory course teaching materials to undergraduate students enrolled in BIOH 365. Students enrolled in BIOH 461 have the option of co-enrolling in the cadaver dissection course.

BIOH 462 - Principles Medical Physiology

Credits: 3. Offered spring. Prereq., C (2.00) or better in BIOH 365, 370, and either CHMY 123N or 143N or consent of instr. An advanced course in human physiology for students preparing for careers in health care.

Course Attributes: Writing Course-Advanced

BIOH 463 - Human Anat/Phys II Tutor/Honor

Credits: 3. Offered spring. Prereq., "A" or "B" in BIOH 370 or equiv. and consent of instr. This select group of students performs tutoring for students enrolled in BIOH370; assists in preparation and grading of lecture and laboratory course teaching materials to undergraduate students enrolled in BIOH 370. Students enrolled in BIOH 463 have the option of co-enrolling in the cadaver dissection course.

BIOH 470 - Summer Clinical Laboratory

Credits: 12. Offered summer. Prereq., successful completion of medical technology 3+1 on-campus curriculum, admittance into one of our affiliated clinical practicum programs, and consent of instructor. Professional training in clinical laboratory sciences (medical technology).

BIOH 471 - Professional Training I

Credits: 13. Offered autumn. Prereq., BIOH 470. Continuation of BIOH 470. Professional training at clinical site(s).

BIOH 472 - Professional Training II

Credits: 12. Offered spring. Prereq., BIOH 471. Continuation of BIOH 471. Professional training at clinical site(s).

BIOH 480 - Tchg Anatomy & Physiology I

Credits: 3 TO 4. Offered autumn. Prereq., "A" or "B" in BIOH 365 and 370 or equiv. and consent of instr. This select group of students assists in preparation and grading of demonstrations and laboratory teaching materials; and provides laboratory anatomy and physiology instruction to undergraduate students enrolled in BIOH 365. Students enrolling for the 4 credit option will also provide occasional comparable assistance for BIOH 112.

BIOH 481 - Tchg Anatomy & Physiology II

Credits: 3 TO 4. Offered spring. Prereq., "A" or "B" in BIOH 365 and 370 or equiv. and consent of instr. This select group of students assists in the preparation and grading of demonstrations and laboratory teaching materials; and provides laboratory anatomy and physiology instruction to undergraduate students enrolled in BIOH 370. Students enrolling for the 4 credit option will also provide occasional comparable assistance for BIOH 113.

BIOH 491 - Special Topics

Credits: 1 TO 10. (R-10) Offered intermittently. Prereq., consent of instr. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

Biology

BIOL 315 - Peer Advising Internship

Credits: 1. (R-6) Offered autumn and spring. Prereq., consent of instr. Supervised training and internship for peer advisors who will gain knowledge and ability to communicate degree requirements and relate the various

degree offerings to professional and career goals. No more than two credits are allowed toward upper-division major requirements.

BIOL 435 - Comparative Animal Physiology

Credits: 3. Offered spring. Prereq., BIOB 260 or equivalent. Animal physiology with emphasis on diversity of functional processes, with strong links to broader ecological and evolutionary contexts.

BIOL 484 - Plant Evolution

Credits: 3. Offered fall, alternate years. Prereq., BIOB 272. Lecture, reading and discussion on the evolutionary processes that shape major patterns of plant diversity. Topics include but are not restricted to: local adaptation, floral and mating system evolution, polyploidy, genome evolution, and speciation.

BIOL 492 - Seminars in Ecol & Res Man

Credits: 1. Offered summers only at Flathead Lake Biological Station. Prereq., BIOL 342 or BIOE 370/371 or taken concurrently with BIOL 342. Seminar course that meets weekly for 2 hours in the evening. Includes seminar speaker and discussion.

Biology-Microbiology

BIOM 135N - Hot Spring Micb: Yellowstone

Credits: 3. Offered autumn alternate years. A field and laboratory based exploration of the microbial diversity of the thermal features of our first national park. Topics to be discussed include how these communities are shaped by the physical and chemical conditions of the environment and how microorganisms can thrive at life's extremes. Includes a field trip to Yellowstone National Park. Course Attributes: Natural Science Course

BIOM 227 - Vectors and Parasites

Credits: 3. Offered spring. Prereq., college level general biology class is recommended but not required. An introduction to the major groups of parasites and arthropod-borne pathogens infecting humans worldwide. The class will stress the biology, transmission dynamics, prevention and control of these organisms.

BIOM 250N - Microbiology for Hlth Sciences

Credits: 3. Offered spring. Infectious diseases, including concepts of virulence, resistance, prevention and control of microbial diseases in the individual and in the community. If laboratory experience is desired, the student may enroll concurrently in BIOM 251. Credit not allowed toward a major in microbiology. Course Attributes: Natural Science Course

BIOM 251 - Microbiology Hlth Sciences Lab

Credits: 1. Offered spring. Prereq. or coreq., BIOM 250N. Observation of live microorganisms, their characteristics and activities. Experience with microbiological techniques. Credit not allowed toward a major in microbiology.

BIOM 291 - Special Topics

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

BIOM 360 - General Microbiology

Credits: 3. Offered autumn. Prereq., CHMY 123N or 143N; Prereq. or coreq., BIOB 260. Microbial structure and function, growth and reproduction, physiology, ecology, genetics, environmental factors, control of microorganisms and sterility, antimicrobial agents, microbial diversity.

BIOM 361 - General Microbiology Lab

Credits: 2. Offered autumn. Prereq. or coreq., BIOM 360. Basic microbiology procedures and techniques.

BIOM 390 - Undergraduate Research

Credits: 1 TO 6. (R-10) Offered every term. Prereq., consent of instr. Independent research under the direction of a faculty member. Graded credit/no credit.

BIOM 400 - Medical Microbiology

Credits: 3. Offered autumn. Microbial structure and functions, pathogenic microorganisms, virology, immunology. Credit not allowed toward a major in microbiology.

BIOM 402 - Medical Bacteriology & Mycology

Credits: 3. Offered spring. Prereq., BIOM 360, 361. A study of the pathogenic bacteria and fungi and the diseases they produce.

BIOM 403 - Medical Bacteriology & Mycology Lab

Credits: 2. Offered spring. Prereq. or coreq., BIOM 402. Laboratory study of pathogenic bacteria and fungi.

BIOM 407 - Clinical Diagnosis

Credits: 2. Offered spring. Prereq., BIOM 360-361 or BIOH 365 or BIOM 402/403 (may concur). Principles of blood chemistry, urinalysis, blood banking, serology and other clinical parameters of disease and health.

BIOM 408 - Clinical Diagnosis Lab

Credits: 1. Offered spring. Prereq., or coreq., BIOM 407, and BIOM 360-361 or BIOH 365 or BIOM 402/403 (may concur). Clinical diagnostic methods.

BIOM 410 - Microbial Genetics

Credits: 3. Offered spring. Prereq., BIOM 360 and 361. The molecular genetics of prokaryotic organisms including: structure and replication of the prokaryotic chromosome; gene expression; mutagenesis and DNA repair; plasmids and other tools of genetic engineering; transmission of genetic material and recombination in prokaryotes; regulation of gene expression in prokaryotes; recombinant DNA and biotechnology.

BIOM 411 - Experimental Microbial Genetics Lab

Credits: 1. Offered spring. Prereq. or coreq., BIOM 410. Experiments in microbial genetics: Analysis of genes and genomes.

BIOM 415 - Microbial Diversity Ecology & Evolution

Credits: 3. Offered spring. Prereq., BIOB 260, 272, BIOM 360-361 or consent of instr. A broad overview of the physiological, phylogenetic and genomic diversity and ecology of microorganisms within a framework of general ecological principles. Focuses on microbial interactions with their environment at the level of the individual, population and community, including intimate associations with plants and animals. Surveys current methods for studying microbial ecology and diversity in the environment.

BIOM 427 - General Parasitology

Credits: 2. Offered autumn. Prereq., BIOB 272. Parasitism as a biological phenomenon, origin of parasitism, adaptations and life cycles, parasite morphology, fine structure, physiology, parasites and their environment.

BIOM 428 - General Parasitology Lab

Credits: 2. Offered autumn. Coreq., BIOM 427. Taxonomy, morphology and identification of parasitic protozoa, helminths and arthropods.

BIOM 435 - Virology

Credits: 3. Offered spring. Prereq., BIOB 260, and either BIOM 360 or BIOM 400. The general nature of viruses, with emphasis on the molecular biology of animal and human viruses. Co-convenes with BIOM 535.

Course Attributes: Co-Convened Course

BIOM 450 - Microbial Physiology

Credits: 3. Offered autumn. Prereq., BIOM 360-361. Microbial structure and function, physiological diversity, microbial metabolism, role of microbial activity in the environment.

BIOM 451 - Microbial Physiology Lab

Credits: 1. Offered autumn. Coreq., BIOM 450. Experimental approaches to analysis of microbial structure, composition and metabolism.

BIOM 490 - Adv Undergrad Research

Credits: 1 TO 10. (R-10) Offered every term. Prereq., BIOM 360, junior or senior standing and consent of instr. Independent research under the direction of a faculty member. Graded credit/no credit. Course Attributes:

Research & Creative Schlrshp

BIOM 491 - Special Topics

Credits: 1 TO 10. (R-10) Offered intermittently. Experimental offerings of new courses, experimental offerings of visiting professors, or one-time offerings of current topics.

BIOM 494 - Seminar

Credits: 1. (R-3) Offered intermittently. Prereq., senior standing in natural sciences. Recent topics in microbiology and related subjects.

BIOM 498 - Internship

Credits: 1 TO 6. (R-6) Offered every term. Prereq., consent of instr. Extended classroom experience which provides practical application of classroom learning during placements off campus. Course Attributes:

Internships/Practicums

BIOM 499 - Undergraduate Thesis

Credits: 3 TO 6. (R-6) Offered every term. Prereq., senior standing and consent of instr. Preparation of a thesis or manuscript based on undergraduate research for presentation and/or publication. Student must give an oral or poster presentation at the Biological Sciences Undergraduate Research Symposium or a scientific meeting. Graded credit/no credit.

BIOM 502 - Advanced Immunology

Credits: 3. Offered autumn even-numbered years. Advanced topics and immunological techniques used in modern immunology. Level: Graduate

BIOM 505 - Advanced Topics in Metagenomics

Credits: 1. (R-8) The course comprises a study group of four faculty 4-6 graduate students and select advanced undergraduates that meets weekly to consider and discuss advances in the areas of metagenomics and bioinformatics research based on recent publications in the primary literature or on their own research

findings. There are no specific course prerequisites, but the course is only appropriate for microbiology and computer science graduate and advanced undergraduate students and requires permission of the instructor for enrollment. Level: Graduate

BIOM 509 - Advanced Virology

Credits: 3. Offered spring add-numbered years. Prereq., BIOM 435 (MICB 420). Students are presented with research papers that have been pivotal to the understanding of important molecular or genetic concepts in virology. Level: Graduate

BIOM 535 - Advanced Virology

Credits: 3. Coreq., BIOB 596. A "principles-based" discussion of virology, focusing on the molecular processes and events that must be completed by all viruses for successful replication within an individual host, and spread through host populations. The molecular basis of alternative replication strategies, the interactions of viruses with hosts organisms, and how these interactions lead to disease will be presented with examples drawn from a representative set of more well-understood animal viruses. BIOM 535 emphasizes independent, creative, critical thought. Co-convenes with BIOM 435. Level: Graduate Course Attributes: Co-Convened Course

BIOM 540 - Microbial Pathogenesis

Credits: 3. Offered fall. Prereq., graduate standing. Current concepts in pathogenesis at the molecular and cellular levels. Focus is on microbial (viral, bacterial) and genetic factors leading to disease and the host's involvement in the process. Level: Graduate

BIOM 545 - Adv Topics in Microb Ecol

Credits: 1. (R-4) Offered every term. Prereq., graduate standing or consent of instr. Discussion of selected themes of the ecology of microorganisms with a focus on the recent primary literature. Level: Graduate

BIOM 546 - Experimental Microb Ecol

Credits: 1. Offered every term. Prereq., graduate standing or consent of instr. Focus on experimental design, methods, and presentation of experimental results in the area of microbial ecology. Level: Graduate

BIOM 570 - Intro to Research

Credits: 1. (R-2) Offered autumn and spring. Prereq., graduate standing. Required course for biochemistry and microbiology graduate students. Instruction in basic research techniques, research equipment and reading in the relevant scientific literature. Students conduct research projects under faculty mentors of their choosing. Level: Graduate

BIOM 594 - Seminar

Credits: 1. (R-4) Offered autumn and spring. Prereq., graduate standing or consent of instr. Same as BCH 594. Presentation of current research in biochemistry and molecular biology by senior graduate students, faculty, and invited outside speakers. Level: Graduate

BIOM 595 - Special Topics

Credits: 1 TO 3. (R-6) Offered intermittently. Prereq., graduate standing. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Level: Graduate Course Attributes: Internships/Practicums

BIOM 596 - Independent Study

Credits: 1 TO 6. (R-6) Prereq., consent of instr. Credit for independent research project unrelated to thesis or dissertation. Level: Graduate

BIOM 597 - Research

Credits: 1 TO 18. (R-18) Offered intermittently. Prereq., graduate standing, one semester residence. Level: Graduate

BIOM 599 - Thesis

Credits: 1 TO 10. (R-10) Offered intermittently. Prereq., master's student in microbiology. Laboratory research for and preparation of a master's thesis. Level: Graduate

BIOM 699 - Dissertation

Credits: 1 TO 20. (R-20) Offered intermittently. Prereq., doctoral student in microbiology. Laboratory research for and preparation of a doctoral dissertation. Level: Graduate

Biology - Organismal

BIOO 101N - Survey MT Wildlife & Habitats

Credits: 3. Offered autumn. Prereq., one course in biology. Interpreting biological patterns associated with selected Montana wildlife species, including mammals, birds, reptiles and amphibians. Course Attributes: Natural Science Course

BIOO 105N - Introduction to Botany

Credits: 3. Offered spring. Introduction to the plant kingdom including anatomy, physiology and ecology. Course Attributes: Natural Science Lab Course

BIOO 320 - General Botany

Credits: 5. Offered autumn. Prereq., BIOB 170N-171N, 260. Prereq. or coreq., BIOB 272. Anatomy, morphology, ecology and physiology of photosynthetic organisms.

BIOO 335 - Rocky Mountain Flora

Credits: 3. Offered spring. Prereq., one college-level course in Biology or consent of instr. Elements of the evolution, geography and natural affinities of flowering plants. Identification using a manual of native plants of Montana.

BIOO 340 - Biology and Mgmt of Fishes

Credits: 4. Offered autumn. Prereq., BIOB 272 and either STAT 216 or WILD 240. Diversity, adaptations and ecology of fishes. Analysis and management of fish populations and communities.

BIOO 433 - Plant Physiology

Credits: 3. Offered spring. Prereq., BIOB 260 or consent of the instructor. The molecular, biochemical and biophysical basis of plant function, from the subcellular to the whole organism level.

BIOO 434 - Plant Physiology Lab

Credits: 1. Offered spring. Prereq or coreq., BIOO 433. Laboratory exercises designed to familiarize students with concepts and techniques in plant physiology.

BIOO 462 - Entomology

Credits: 4. Offered alternate springs. Prereq. or Coreq., BIOB 272. The classification, morphology, anatomy, development, life-history, behavior and ecology of insects. Labs include identification of major insect groups, internal and external anatomy and student collections.

BIOO 470 - Ornithology

Credits: 4. Offered spring. Prereq. or Coreq., BIOB 272; major of biology, Pre-Wildlife Biology, or Wildlife Biology, and must be of junior or senior standing. The classification, structure, evolution, behavior and ecology of birds.

BIOO 475 - Mammalogy

Credits: 4. Offered autumn. Prereq., BIOB 272. The evolution, systematics, anatomy, physiology and ecology of mammals.

BIOO 486 - Field Techniq in Mammalogy

Credits: 2. Offered intermittently. Prereq., BIOO 475 or equiv. and consent of instr. A "hands-on" approach to lab and field techniques employed for the study of mammals. Includes mark/recapture live trapping methods, remote cameras, and tracking plates of non-invasive censusing.

BIOO 490 - Adv Undergrad Research

Credits: 1 TO 10. (R-10) Offered every term. Prereq., junior or senior standing and consent of instr. Independent research under the direction of a faculty member.

Biology - Systems Ecology

BIOS 532 - Ecosystem Ecology

Credits: 3. Offered autumn every other year. Prereq. CHMY 141N or the equivalent. Coreq. CHMY 143N and BCH 111. This course includes the fundamentals of an ecosystem approach to ecological research by emphasizing relationships among physical, chemical, and biotic elements of interactive systems. It will provide a fundamental basis for more advanced Systems Ecology courses (e.g., Limnology, Integrated Systems Ecology, Landscape Genetics, etc.). Level: Graduate

BIOS 534 - Integrated Systems Ecology

Credits: 3. Offered spring semester alternate years. Principles, theories and empirical studies that describe the complex attributes and processes of coupled natural and human systems. Landscape, climate, economic and social change dynamics and processes emphasized. Flagship course of the UM-DBS Systems Ecology Program. Students strongly advised but not required to take BIOS 532 Fundamentals of Ecosystem Ecology prior to this course. Level: Graduate

BIOS 599 - Thesis

Credits: 1 TO 10. R-10

Microbiology

MICB 699 - Dissertation

Credits: 1 TO 20. (R-20) Offered intermittently. Prereq., doctoral student in microbiology. Laboratory research for and preparation of a doctoral dissertation. Level: Graduate

Central and Southwest Asian Studies

Dr. Ardi Kia, Advisor

The University of Montana has emerged as a national and international leader in recognizing the significance of Central and Southwest Asia, and translating that awareness into a major academic program. The program builds on significant faculty experience and expertise in the region, and includes scholars from a variety of academic disciplines. The program has also organized intensive summer language training programs at UM, as well as summer study tours for K-12 teachers to Central Asia, and also hosts an annual conference that brings leading scholars, diplomats, analysts, and journalists to the UM campus.

The University of Montana offers an undergraduate major as well as a Minor in Central and Southwest Asian Studies. Arabic, Chinese, Persian, Russian and Turkish language instruction are also offered. Faculty exchanges have been organized with universities in China, Egypt, Georgia, Kazakhstan, Kyrgyzstan, Morocco, Russia and Tajikistan.

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Arts Level: Major Subject: **Central & Southwest Asian Stds**

Total Credits: 42 Cumulative GPA Required: 2.0

Lower Division Core

Category Name: Lower Division Core Courses Rule: Must complete all of the following courses

Criterion: C- Number of Credits 12

Course Listing

ANTY 141H	The Silk Road	3
ANTY 241H	Central Asian Culture and Civ	3
CSWA 262H	Islamic Civil: Classical Age	3
CSWA 264	Islamic Civ: Modrn Era	3

Commentary: null

Commentary: Upper Division Core

Category Name: Upper-Division Core Courses

Rule: Must complete 3 of the following courses

Criterion: C- Number of Credits 9

Course Listing

ANTY 347	Central Asia and Its Neighbors	3
ANTY 444	Artistic Tradtns Central Asia	3
HSTR 368	Iran Betw Two Revol	3

HSTR 386 Nationalism in Mod Middle East 3

HSTR 442 Cities/Landscps Central Asia 3

Upper Division Electives

Category Name: Language Electives

Rule: Must complete 1 of the following subcategories

Criterion: Number of Credits 18-20

Course Listing Commentary:

Subcategory Name: Arabic

Rule: May choose to complete the following courses

Criterion: C- Number of Credits 18

Course Listing

ARAB 101 Elementary Modern Arabic I 5

ARAB 102 Elementary Modern Arabic II 5

ARAB 201 Intermediate Modern Arabic I 4

ARAB 202 Intermediate Modern Arabic II 4

Commentary:

Subcategory Name: Chinese

Rule: May choose to complete the following courses

Criterion: C- Number of Credits 20

Course Listing

CHIN 101 Elementary Chinese I 5

CHIN 102 Elementary Chinese II 5

CHIN 201 Intermediate Chinese I 5

CHIN 202 Intermediate Chinese II 5

Subcategory Name: Russian

Rule: May choose to complete the following courses

Criterion: C-

Course Listing Number of Credits 18

RUSS 101 Elementary Russian I 5

RUSS 102 Elementary Russian II 5

RUSS 201 Intermediate Russian I 4

RUSS 202 Intermediate Russian II 4

Commentary: Capstone

Category Name: Capstone Requirement

Rule: Must complete 1 of the following courses

Criterion: C- Number of Credits 3

Course Listing

ANTY 494 Seminar: Central Asia 3

HSTR 496 Independent Study 1 To 12

Commentary: If taking HSTR 496, student is required to take the course for 3 credits and complete a 25 page research paper. Either course fulfills the Upper-Division Writing Requirement for the Major.

Degree Commentary: Students are required to complete 12 credits of Lower-Division core courses, 9 credits of Upper-Division core courses, in addition to completing the Capstone requirement. Students also must complete the second year sequence (8-10 credits) of either Arabic OR Chinese OR Russian, for a combined total of 42-44 credits. Students are strongly recommended to take a third or fourth year of language study.

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Minor Level: Minor Subject: **Central & Southwest Asian Stds**

Total Credits: 18 Cumulative GPA Required: 2.0

The Central and Southwest Asian Studies Minor is available to all students. It consists of eighteen credits. Students selecting the minor are required to successfully complete HSTR 146 (HIST106)/ANTH 106H/AS 106H and six credits in foundational Central and Southwest Asian Studies courses (200-level courses). Students must then complete nine credits of additional course work at the 300- or 400- level. No language courses are required; however, students pursuing the minor are strongly encouraged to meet the University-wide general education foreign language competency requirement by completing at least the second semester of one of the following languages (100 level or higher): Chinese, Persian, Arabic, Turkish or Russian. Participation in a study-abroad program is strongly recommended.

Lower Division Core

Category Name: Lower Division Core Courses

Rule: Complete the following subcategories of courses

Criterion: Number of Credits 9

Course Listing Commentary:

Subcategory Name: Introductory Course Rule: Must complete the following course

Criterion: C- Number of Credits 3

Course Listing

ANTY 141H The Silk Road 3

Subcategory Name: Foundational Courses Rule: Must complete 2 of the following courses

Criterion: C- Number of Credits 6

Course Listing

CSWA 262H Islamic Civil: Classical Age 3

CSWA 264 Islamic Civ: Modrn Era 3

HSTR 241H Central Asian Cult & Civ 3

Upper Division Core

Category Name: Upper Division Core Courses Rule: Must complete 3 courses

Criterion: C Number of Credits 9

Course Listing

ANTY 347 Central Asia and Its Neighbors 3

ANTY 442 Cities/Landscapes Central Asia 3

ANTY 492	Independent Study	1 To 6
CSWA 441	Seminar: Central Asia	3
CSWA 457	Artistic Trad Cent & SW Asia	3
HSTR 368	Iran Betw Two Revol	3
HSTR 386	Nationalism in Mod Middle East	3
HSTR 492	Independent Study	1 To 12

Commentary: If an independent study course is selected it must be taken for 3 credits.

Commentary: Degree Commentary

The Central and Southwest Asian Studies minor is available to all students. No language courses are required.

Participation in a study-abroad program is strongly recommended.

Degree Commentary

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Arts Level: Major Subject: **Geography**

Total Credits: 36 Cumulative GPA Required: 2.5

Lower Division Core

Category Name: Introduction to Geography Rule: Must complete all of the following courses:

Criterion: C- Number of Credits 7

Course Listing

GPHY 111N	Intro to Physical Geography	3
GPHY 112N	Intro to Phys Geography Lab	1
GPHY 121S	Human Geography	3

Commentary: Lower Division Core

Category Name: Regional Geography Course

Rule: Must complete at least 1 of the following courses

Criterion: C- Number of Credits 3

Course Listing

GPHY 141S	Geography of World Regions	3
GPHY 144	Montana's Mountains	3
GPHY 241	Montana	3
GPHY 243X	Africa	3
GPHY 245X	The Middle East	3
GPHY 342	North America	3
GPHY 344	Crown of the Continent	3
GPHY 347	Regional Geography (Mult Reg)	3
GPHY 348	Field Studies in Geography	3
GPHY 442	Regionalism & Rocky Mtn West	3
GPHY 444	High Asia	3
GPHY 445	Regional Geography	3

Commentary: Lower Division Core

Category Name: Geographic Methods

Rule: Must complete all of the following courses

Course Listing

GPHY 284 Intro to GIS and Cartography 3

GPHY 385 Field Techniques 3

Commentary: Upper Division Core

Category Name: Upper Division Systematic Geography Rule: Must complete the following subcategories of courses

Criterion: C- Number of Credits 9

Course Listing Commentary:

Subcategory Name: Physical Geography

Rule: Must complete at least 1 of the following courses

Criterion: C- Number of Credits 3

Course Listing

ERTH 303N Weather and Climate 3

GPHY 311N Biogeography 3

GPHY 314 Global Mountain Environments 3

GPHY 317 Geomorphology 3

GPHY 438 Mountain Field Study 3

GPHY 525 Adv Physical Geography 3

Commentary:

Subcategory Name: Geography and Society Rule: Must complete at least 1 of the following:

Criterion: C- Number of Credits 3

Course Listing

GPHY 323S Econ. Geog. of Rural Areas 3

GPHY 421 Sustainable Cities 3

GPHY 434 Food and Famine 3

GPHY 443 Cultural & Global Competence 3

GPHY 515 Adv Human Geography 3

Commentary:

Subcategory Name: Human Environment Interaction Rule: Must complete at least 1 of the following:

Criterion: C- Number of Credits 3

GPHY 335 Water Policy 3

GPHY 336 Exploration & Discovery 3

GPHY 338 Mountains and Society 3

GPHY 432 Human Role Environ Change 3

GPHY 433 Cultural Ecology 3

Commentary: Major Electives

Category Name: Degree Electives

Rule: Must complete 10 credits of GPHY electives to fulfill the 36 degree credit total Criterion: C- Number of Credits 10

Course Listing

Commentary: Students must fulfill the degree credit total of 36 credits plus the university requirement for 39 upper division credits.

Commentary: Capstone

Category Name: Capstone

Rule: Seniors must complete the following course

Criterion: C- Number of Credits 1

Course Listing

GPHY 400 Geography Capstone 1

Commentary: Seniors must enroll in GPHY 400 in fall, attend GPHY 500 in fall, and complete course requirements in spring.

Commentary:

Upper Division Writing

Category Name: Upper Division Writing

Rule: Must complete 1 of the following courses

Criterion: C- Number of Credits 3

Course Listing

GPHY 335 Water Policy 3

GPHY 433 Cultural Ecology 3

GPHY 499 senior thesis / capstone 3

Commentary: GPHY 335 or GPHY 433 will also count toward the upper division core requirements GPHY 499 will also count toward upper division elective credits.

Degree Specific Symbolic Systems

Category Name: General Ed Symbolic Systems

Rule: Must complete either 1 year of a foreign language or STAT 216 Introduction to Statistics

Criterion: C- Number of Credits 3-10

Course Listing

Commentary: Gen Ed credits do not count towards degree credits.

Chemistry and Biochemistry Department

Christopher P. Palmer, Chair

Chemistry is the central science that involves the study of molecules, their structures, their combinations, their interactions, and the energy changes accompanying chemical processes.

The Department offers the following degrees: B.S., B.A., M.S., M.A., and Ph.D.

Prospective students desiring further information on any program of the Department of Chemistry and Biochemistry should visit the [Department of Chemistry and Biochemistry](#) and [Biochemistry Program](#) websites.

High School Preparation: In addition to the general University admission requirements, it is strongly recommended that a student take four years of mathematics, four (or more) years of science (earth and space science, biology, chemistry, and physics), four years of a foreign language, and four years of English. Refer to graduation requirements listed previously in the catalog. See index.

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Arts Level: Major Subject: **Chemistry**

Total Credits: 89 Cumulative GPA Required: 2.0

The courses required for the B.A. degree provide a less extensive training in chemistry than do the courses required for the American Chemical Society certified B.S. degree. This is to allow the student to supplement his or her program with courses that meet his or her specific needs. Thus this degree provides the core of traditional preparation in chemistry together with latitude for combination with an interdisciplinary field or the Teacher Preparation program. It is strongly advised that students using this degree obtain faculty advice in planning their program.

Lower Division Core

Category Name: Lower Core Courses Rule: All subcategories must be completed

Criterion: Number of Credits

Course Listing Commentary:

Subcategory Name: General Chemistry Rule: Complete both courses

Criterion: C- Number of Credits 10

Course Listing

CHMY 141N College Chemistry I 5

CHMY 143N College Chemistry II 5

Subcategory Name: Organic Chemistry Rule: Complete all courses

Criterion: C- Number of Credits 10

Course Listing

CHMY 221 Organic Chem I 3

CHMY 222 Org Chm I Lab 2

CHMY 223 Organic Chm II 3

CHMY 224 Org Chm II Lab2

Subcategory Name: Physics

Rule: Complete either PHSX 205N-206N and 207N-208N or PHSX 215N-216N and 217N-218N

Criterion: C-

Course Listing Number of Credits 10

PHSX 205N College Physics I 4

PHSX 206N College Physics I Laboratory 1

PHSX 207N College Physics II 4

PHSX 208N College Physics II Laboratory 1

PHSX 215N Fund of Physics w/Calc I 4

PHSX 216N Physics Laboratory I w/Calc 1

PHSX 217N Fund of Physics w/Calc II 4

PHSX 218N Physics Laboratory II w/Calc 1

Subcategory Name: Mathematics Rule: Complete all courses

Criterion: C- Number of Credits 12

Course Listing

M 171 Calculus I 4

M 172 Calculus II 4

M 273 Multivariable Calculus 4

Subcategory Name: Computer Science Rule: Complete course

Criterion: C- Number of Credits 3

Course Listing

CSCI 250 Computer Mdlng/Science Majors 3

Commentary: Upper Division Core

Category Name: Upper Core Courses Rule: All subcategories must be completed

Criterion: Number of Credits

Course Listing Commentary:

Subcategory Name: Analytical Chemistry Rule: Complete all of the following courses

Criterion: C- Number of Credits 8

Course Listing

CHMY 311 Analytical Chem-Quant Analysis 4

CHMY 421 Advanced Instrument Analysis 4

Subcategory Name: Physical Chemistry Rule: Complete all of the following courses

Criterion: C- Number of Credits 8

Course Listing

CHMY 371 Phys Chem-Qntm Chm & Spctrscopy 4

CHMY 373 Phys Chem-Kntcs & Thrmdynmcs 4

Commentary: Major Electives

Category Name: Advanced Electives

Rule: Complete 15 credits of advanced electives

Criterion: C- Number of Credits 15

Course Listing

Commentary: Complete 15 credits of advanced electives approved by Chemistry Adviser

Degree Specific Modern & Classical Languages Category Name: Modern Foreign Language

Rule: Complete 10 credits of modern foreign language

Criterion: Pass Number of Credits 10

Course Listing Commentary:

Degree Specific Ethical & Human Values Category Name: Ethics

Rule: Complete the following course

Criterion: C- Number of Credits 3

Course Listing

CHMY 302E Chem Lit and Science Writing 3

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Science Level: **Major** Subject: **Chemistry**

Total Credits: 94 Cumulative GPA Required: 2.0

The courses required for the B.S. degree provide a solid education in chemistry for the professional chemist and in preparation for graduate work in most areas of chemistry. These requirements meet the latest certification standards of the American Chemical Society.

Lower Division Core

Criterion: Number of Credits 45

Course Listing Commentary:

Subcategory Name: General Chemistry Rule:

Criterion: C- Number of Credits 10

Course Listing

CHMY 141N College Chemistry I 5

CHMY 143N College Chemistry II 5

Subcategory Name: Organic Chemistry Rule:

Criterion: C- Number of Credits 10

Course Listing

CHMY 221 Organic Chem I 3

CHMY 222 Org Chm I Lab 2

CHMY 223 Organic Chm II 3

CHMY 224 Org Chm II Lab 2

Subcategory Name: Physics Rule:

Criterion: C- Number of Credits 10

Course Listing

PHSX 215N Fund of Physics w/Calc I 4

PHSX 216N Physics Laboratory I w/Calc 1

PHSX 217N Fund of Physics w/Calc II 4

PHSX 218N Physics Laboratory II w/Calc 1

Subcategory Name: Mathematics Rule:

Criterion: C- Number of Credits 12

Course Listing

M 171 Calculus I 4

M 172 Calculus II 4

M 273 Multivariable Calculus 4

Criterion: Number of Credits 3

Course Listing

CSCI 250 Computer Mdlng/Science Majors 3

Commentary: Upper Division Core

Category Name: Upper Division Core Courses

Rule: All courses in all subcategories listed are required

Criterion: Number of Credits 33

Course Listing Commentary:

Subcategory Name: Analytical Chemistry Rule:

Criterion: C- Number of Credits 8

Course Listing

CHMY 311 Analytical Chem-Quant Analysis 4

CHMY 421 Advanced Instrument Analysis 4

Subcategory Name: Physical Chemistry Rule:

Criterion: C- Number of Credits 8

Course Listing

CHMY 371 Phys Chem-Qntm Chm & Spctrscopy 4

CHMY 373 Phys Chem-Kntcs & Thrmdynmcs 4

Subcategory Name: Inorganic Chemistry Rule:

Criterion: C- Number of Credits 8

Course Listing

CHMY 401 Advanced Inorganic Chemistry 3

CHMY 402 Advanced Inorganic Chem Lab 2

CHMY 403 Descriptive Inorganic Chem 3

Commentary:

Criterion: C- Number of Credits 6

Course Listing

BCH 480 Advanced Biochemistry I 3

BCH 486 Biochemistry Research Lab 3

Commentary:

Subcategory Name: Mathematics Rule:

Criterion: C- Number of Credits 3

Course Listing

M 311 Ordinary Diff Equations/System 3

Commentary:

Commentary: Major Electives

Category Name: Advanced Electives

Rule: Choose 3 to 9 credits from the listed courses.

Criterion: C- Number of Credits 3

Course Listing

CHMY 391 Special Topics/Expmntl Crse 1 To 9
CHMY 442 Aquatic Chemistry 3
CHMY 445 Indstrl Chm & Its Impct on Soc 3
CHMY 465 Organic Spectroscopy 3
CHMY 491 Special Topics/Expmntl Crse 1 To 9
CHMY 492 Independent Study 1 To 9
CHMY 499 Senior Thesis/capstone 3

Commentary: 3 credits maximum of CHMY 492 or CHMY 499 may be applied toward degree requirements.

Other classes in chemistry, physics, geology, biochemistry, or mathematics may be used to meet the Advanced Electives requirement with approval of the Chemistry Adviser.

2 additional Advanced Electives of at least 3 credits each may be substituted for the Modern Language requirement with approval of the Chemistry Adviser.

Commentary:

Degree Specific Modern & Classical Languages Category Name: Modern Foreign Language

Rule: Complete 2 semesters (10 credits) of a modern language or 2 additional advanced elective courses Criterion:

Pass Number of Credits 10

Course Listing

Commentary:

Degree Specific Ethical & Human Values Category Name: Ethics

Rule: Complete the following course

Criterion: C- Number of Credits 3

Course Listing

CHMY 302E Chem Lit and Science Writing 3

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Science Level: Major Subject: **Chemistry** Option: **Environmental Chemistry**

Total Credits: 89 Cumulative GPA Required: 2.0

Lower Division Core

Category Name: Lower Core Courses

Rule: All courses in all subcategories listed are required

Criterion: Number of Credits

Course Listing Commentary:

Subcategory Name: General Chemistry Rule:

Criterion: C- Number of Credits 10

Course Listing

CHMY 141N College Chemistry I 5

CHMY 143N College Chemistry II 5

Subcategory Name: Organic Chemistry Rule:

Criterion: C- Number of Credits 10

Course Listing

CHMY 221 Organic Chem I 3
CHMY 222 Org Chm I Lab 2
CHMY 223 Organic Chm II 3
CHMY 224 Org Chm II Lab2

Subcategory Name: Physics Rule:

Criterion: C- Number of Credits 10

Course Listing

PHSX 215N Fund of Physics w/Calc I 4
PHSX 216N Physics Laboratory I w/Calc 1
PHSX 217N Fund of Physics w/Calc II 4
PHSX 218N Physics Laboratory II w/Calc 1

Subcategory Name: Mathematics Rule:

Criterion: C- Number of Credits 8

Course Listing

M 171 Calculus I 4
M 172 Calculus II 4

Subcategory Name: Geology Rule:

Criterion: C- Number of Credits 4

Course Listing

GEO 101N Intro to Physical Geology 3
GEO 102N Intro to Physical Geology Lab 1

Subcategory Name: Biochemistry and Biology Rule:

Criterion: C- Number of Credits 12

Course Listing

BCH 110 Intro Biology for Biochemists 3
BCH 111 Intro Biol for Biochemists Lab 1
BIOB 260 Cellular and Molecular Biology 4
BIOB 272 Genetics and Evolution4

Commentary: Upper Division Core

Category Name: Upper Division Core Courses Rule: All subcategories must be completed

Criterion: Number of Credits

Course Listing Commentary:

Subcategory Name: Analytical Chemistry Rule: Complete all of the following courses

Criterion: C- Number of Credits 8

Course Listing

CHMY 311 Analytical Chem-Quant Analysis 4
CHMY 421 Advanced Instrument Analysis 4

Subcategory Name: Physical Chemistry Rule: Choose 1 of the listed courses