BIOLOGY (BIOL)

BIOL 115 Human Biology 4.00
University Studies course investigating the structure and function of the human body as related to areas of health and disease. Designed to meet the University Studies requirement for laboratory science. Does not count toward the Biology major. Not open to those having taken BIOL 270, or 280. (Lecture three hours, laboratory two hours).
University Studies Requirements:
- UST: Natural Sciences - Lab

Typically Offered:
- On-campus: Spring
- Online: Fall & Summer

BIOL 123 Concepts In Biology 4.00
Introduction for non-Biology majors to important biological concepts including chemistry, cell biology, genetics, evolution, plant and animal form and function, and ecology. Laboratory exercises are integrated with lectures and designed to be experimental and inquiry driven. Fulfills the University Studies requirement for laboratory science. Does not count toward the Biology major. (Lecture three hours, laboratory two hours.)
University Studies Requirements:
- UST: Natural Sciences - Lab

Typically Offered:
- On-campus: Spring
- Online: Summer

BIOL 130 Principles of Biology I 4.00
Introduction to important principles of chemistry, cellular, molecular, and evolutionary biology, and the diversity of life. Laboratory experiments are inquiry driven. Intended as the first of a two-course sequence for biology majors, and students with a strong interest in the life sciences. Fulfills the University Studies laboratory science requirement. (Lecture three hours, laboratory two hours.)
University Studies Requirements:
- UST: Natural Sciences - Lab

Typically Offered:
- On-campus: Fall & Spring;

BIOL 132 Principles of Biology II 4.00
The second course in a two-course sequence intended for Biology majors or minors, and other students with a strong interest in the life sciences. Introduces students to the development, structure and function of both plants and animals and the basic principles of ecology. Laboratory exercises are integrated with lectures and designed to be experimental and inquiry driven. (Lecture three hours, laboratory two hours, recitation 1 hour).
Prerequisites:
BIOL 130 or permission of instructor.

Typically Offered:
- On-campus: Fall & Spring;

BIOL 170 Biological Inquiry for Teachers 2.00
This course uses inquiry-based science methods to answer open-ended biological questions that have environmental connections. This course is required of Elementary Education majors and satisfies environmental science requirements for the Wisconsin Teaching Licensure and the UW-Superior University Studies program. Lecture one hour, laboratory two hours.
University Studies Requirements:
- Natural Sciences - Environmental

Typically Offered:
- On-campus: Fall & Spring
- Online: Fall, Spring, & Summer

BIOL 181 Special Topics 1.00-4.00
In-depth study of specialized current topics in biology selected by the faculty on the basis of student/community interest. May include workshops, seminars, field trips, special problems, independent study, etc. Course may be repeated when topics are different. Instructor permission to enroll in this course.
Typically Offered:
- Occasional by Demand

BIOL 189 Biology Elective 1.00-99.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

BIOL 189ES Biology Elective Environmental Science 1.00-12.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

BIOL 189LS Biology Elective Lab Science 1.00-12.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

BIOL 270 Human Anatomy & Physiology I 4.00
First semester of a two-semester sequence investigating the structure and function of human body systems and mechanisms for maintaining homeostasis within and across each system. Examination of tissues and the integumentary, skeletal, muscular, nervous, and sensory systems. . (Lecture three hours, laboratory two hours.)
Prerequisites:
BIOL 130 or permission of instructor.

Typically Offered:
- On-Campus: Fall;

BIOL 280 Human Anatomy & Physiology II 4.00
Continuation of a two-semester sequence investigating the structure and function of human body systems and mechanisms for maintaining homeostasis within and across each system. Examination of the endocrine, digestive, cardiovascular, respiratory, urinary, and reproductive systems. (Lecture three hours, laboratory two hours.)
Prerequisites:
BIOL 270 or instructor consent.

Typically Offered:
- On-campus: Spring;

BIOL 281 Special Topics 1.00-4.00
In-depth study of specialized current topics in biology selected by the faculty on the basis of student/community interest. May include workshops, seminars, field trips, special problems, independent study, etc. Course may be repeated when topics are different. Instructor permission to enroll in this course.
Typically Offered:
- Occasional by Demand

BIOL 289 Biology Elective 1.00-50.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

BIOL 289ES Biology Elective Environmental Science 1.00-12.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.
University Studies Requirements:
- Natural Sciences - Environmental

BIOL 289LS Biology Elective Lab Science 1.00-12.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

BIOL 312 Biogeography and Conservation 3.00
Study of geographical distributions of plants and animals in the context of spatial and temporal factors influencing species distributions, patterns of species richness, and endemism. Themes related to the conservation of biodiversity will be emphasized including island biogeography, landscape and metapopulation processes, phylogeography and conservation genetics. (Lecture three hours.) BIOL 340 and BIOL 305 recommended.
Prerequisites:
Successful completion of BIOL 330 or BIOL 340, or permission of instructor.

Typically Offered:
- On-campus: Spring, Odd Years;

BIOL 316 Medical Terminology 2.00
Study of basic medical terminology. Prefixes, suffixes, word roots, combining forms, special endings, plural forms, abbreviations, and symbols are emphasized. A programmed learning, word-building systems approach is used to learn, construct, and analyze new terms as they relate to the function and location of body systems. No prerequisite.
Typically Offered:
- On-campus: Spring;

BIOL 325 Plant Taxonomy 4.00
Provides the skills and background to identify flowering plants of northern Wisconsin and Minnesota. Lecture topics focus on floral structure, classification, and distribution of plant families of regional importance, while labs focus on identification of living plant materials using dichotomous keys. Each student will prepare a plant collection. (Lecture three hours, laboratory two hours.)
Prerequisites:
Successful completion of BIOL 330 or BIOL 340, or permission of instructor.

Typically Offered:
- On-campus: Spring, Odd Years;

BIOL 330 Genetics 4.00
Integrating the principles and techniques of Mendelian and molecular genetics to emphasize how biological information is inherited and expressed. Students will also investigate the primary research literature and receive instruction in scientific writing. (Lecture three hours, laboratory two hours.)
Prerequisites:
Successful completion of CHEM 105 and BIOL 130 and BIOL 132 or BIOL 270. (Note: pre-Health program students are not required to take BIOL 132)

Typically Offered:
- On-campus: Spring;

BIOL 340 Ecology and Evolutionary Biology 4.00
Introduction to foundational principles of ecology and evolutionary biology investigating adaptations of organisms to their environment, natural selection, population biology, life-history strategies and evolutions, ecological and evolutionary consequences of species interactions, and ecosystem processes. Lab activities emphasize using standard sampling methods to collect and analyze data from local ecosystems. Completion of CHEM 105 is recommended but not a prerequisite. (Lecture three hours, laboratory three hours).
Prerequisites:
Successful completion of BIOL 132 or permission from the instructor

Typically Offered:
- On-Campus: Fall;

BIOL 350 Limnology 4.00
Study of freshwater biology including the physical and chemical attributes of the environment as well as plants and animals found in lakes and streams. CHEM 105 and BIOL 340 is recommended. (Lecture three hours, laboratory two hours.)
Prerequisites:
Successful completion of BIOL 330 or BIOL 340, or permission of instructor.

Typically Offered:
- On-campus: Fall, Even Years;

BIOL 355 Microbiology 3.00
Exploring how the structure, function and genetics of microorganisms (bacteria, viruses, fungi and protozoa) influence our everyday world. This includes microbes relevant to human health and industry; and the biological and chemical defenses we use to regulate them. (Lecture three hours)
Prerequisites:
Prerequisite for enrolling in BIOL 355 is successful completion of BIOL 330 or BIOL 340

Typically Offered:
- On-campus: Spring;

BIOL 356 Microbiology Laboratory 1.00
Students learn aseptic techniques, culturing techniques, and basic microbial handling techniques useful in medical, ecological, and industrial fields. The laboratory involves the isolation and biochemical identification of soil bacteria and determination of antimicrobial properties. While it is recommended that students take the laboratory and lecture sections concurrently, it is not required. (Laboratory 2 hours).
Prerequisites:
Prerequisite for enrolling in BIOL 356 is successful completion of CHEM 105 and BIOL 330 OR BIOL 340

Typically Offered:
- On-campus: Spring;

BIOL 364 Invertebrate Biology 4.00
A survey of adaptations and classification of invertebrate animals. Characteristics of various taxonomic groups are emphasized within an ecological and evolutionary context. Laboratory activities focus on the functional morphology, comparative anatomy, and identification of representatives of major phyla and classes of invertebrates. field-based lab exercises emphasize sampling and identification of orders and families of arthropods and mollusks in local ecosystems. (lecture three hours, laboratory two hours)
Prerequisites:
Requirement: successful completion of BIOL 330 or BIOL 340, or consent of instructor.

Typically Offered:
- On-campus: Fall, Even Years;

BIOL 380 Vertebrate Biology 4.00
Life histories, habits, habitats, distribution, classification, and recognition of common vertebrates of the north central United States. (Lecture three hours, laboratory two hours.)
Prerequisites:
Successful completion of BIOL 330 or BIOL 340, or permission of instructor.

Typically Offered:
- On-campus: Fall, Even Years;

BIOL 382 Ichthyology 4.00
An introduction to the classification, structure, physiology, distribution, and life histories of fishes. (Lecture three hours, laboratory two hours.)
Prerequisites:
BIOL 330 or 340 or Permission of Instructor

Typically Offered:
- On-campus: Fall, Odd Years;

BIOL 389 Biology Elective 1.00-12.00
Transfer Credits ONLY from another accredited institution not equivalen to a UW-Superior course.

BIOL 399 Cancer Biology 3.00
Investigating the cellular, molecular and genetic origins of the human diseases classified together as cancer. Utilizing both scientific and popular literature, historical context will be provided and current research aimed at improving both diagnostic and therapeutic options will be explored. Topics include carcinogenesis, oncogenes, tumor suppressors, microenvironment influence, migration, invasion and metastasis.
Prerequisites:
BIOL 330 or permission of instructor

Typically Offered:
- On-campus: Fall, Even Years;

BIOL 405 Neurobiology 3.00
Introduction to the structure and function of the nervous system, including neuroanatomy, neurophysiology, and systems neurobiology. Topics include the properties of neurons, glia, and the mechanisms and organization underlying neural signaling; the reward pathway and addiction, sleep, memory; and diseases and disorders of the nervous system. Discussions of neurobiological methods and reading of current neurobiological literature will be included.
Prerequisites:
Successful completion of one course from each of the following bracketed groups: [PSYC 350 or BIOL 330] and [PSYC 275 or BIOL 330 or BIOL 340] or permission of instructor.

Typically Offered:
- On-campus: Spring, Even Years;

BIOL 411 Neurobiology Lab 1.00
This is a curricular undergraduate research experience (CURE) course where students will further their understanding of BIOL 405 course content through engagement with the scientific process. Students will develop a hypothesis, based on a literature review, conduct an experiment, conduct data analysis, and present their research project and findings to their peers. This is a companion course to BIOL 405 and requires concurrent enrollment. Students may sign up for BIOL 491 concurrently, increasing the research component of this course to satisfy the research requirements of the degree. Students interested in enrolling in BIOL 491 credit should work with the instructor to complete a research contract.
Prerequisites:
Prerequisite for BIOL 411 is completion of BIOL 330 or BIOL 340 and Co-requisite BIOL 405 or instructor consent.

Typically Offered:
- On-campus: Spring, Odd Years;

BIOL 412 Developmental Biology 4.00
A comparative analysis of animal embryonic development. Classical embryology will be integrated with genetic regulation of development. Lecture 3 hours, Laboratory 2 hours
Prerequisites:
Prerequisite for BIOL 412 is successful completion of BIOL 330 or consent of instructor

Typically Offered:
- On-Campus: Fall;

BIOL 414 Molecular Pharmacology 3.00
Exploring the scientific study of drug interactions on biological systems and the chemical properties, biological effects, and therapeutic uses of drugs. Includes the study of pharmacodynamics, pharmacokinetics, and pharmacogenomics, drug therapeutics, drug action, and bodily responses to drug events, through studies of specific drugs and drug interactions. This class is designed to meet the requirements for entry in to nursing, physician assistant, or other health related professional programs.
Prerequisites:
Prerequisite for BIOL 414 is completion of BIOL 330 or BIOL 340 or instructor consent.

Typically Offered:
- On-campus: Spring, Even Years;

BIOL 415 Ecology and Management of Forest Ecosystems 4.00
Overview of major factors affecting forest ecosystems including disturbance, species interactions, succession, climate change, timber harvesting/resource extraction practices, and ecosystem management strategies. Emphasis on forests of the western Great Lakes Region. Field activities develop identification and data collection skills and are integrated with a semester-long research project designed to evaluate predictions of a specific ecological hypothesis. The research project may be coupled with the BIOL 491 or ENSC 491 Senior Research course to fulfill the capstone experience requirement for Biology or Environmental Science majors, respectively. (Lecture three hours, laboratory three hours).
Prerequisites:
Successful completion of BIOL 330 or BIOL 340, or permission of instructor.

Typically Offered:
- On-campus: Select Semesters;

BIOL 420 Field Biology 1.00
Study of plants and animals in nature through field trips and observation. Topics change each semester. (Laboratory two hours.)
Prerequisites:
Successful completion of BIOL 330 or BIOL 340, or permission of instructor.

Typically Offered:
- On-campus: Spring, Even Years;

BIOL 440 Cell Biology 4.00
Study of the subcellular structures, protein synthesis & processing, signal transduction, cell cycle, and cell death pathways. Emphasis is place on research techniques, data analysis and modern application of cellular and molecular biology. There is a heavy emphasis on critical thinking scientific literacy and writing of lab reports in this course. (Lecture three hours, laboratory two hours.)
Prerequisites:
Successful completion of BIOL 330 and CHEM 106 or permission instructor

Typically Offered:
- On-campus: Select Semesters;

BIOL 465 Laboratory Techniques in Biochemistry and Cell/Molecular Biology 1.00-2.00
Principles and practices of techniques used in biochemistry and in cell and molecular biology. Includes protein isolation and analysis, enzyme kinetics, carbohydrate analysis, immunological techniques for analysis, and techniques of gene cloning and manipulation. Recommended: CHEM 462, BIOL 355 AND BIOL 440 or concurrent enrollment. (Lecture one hour, laboratory three hours) Cross-listed as: BIOL/CHEM 465.
Prerequisites:
BIOL 330 and CHEM 360 or instructor consent are pre-requisites for this class

Typically Offered:
- On-campus: Spring, Even Years;

BIOL 481 Special Topics 1.00-4.00
In-depth study of specialized current topics in biology selected by the faculty on the basis of student/community interest. May include workshops, seminars, field trips, special problems, independent study, etc. Course may be repeated when topics are different. Instructor permission to enroll in this course.
Prerequisites:
Prerequisite for taking this course is Junior standing or Instructor consent.

Typically Offered:
- On-campus: Select Semesters;

BIOL 489 Biology Elective 9.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

BIOL 489ES Biology Elective Environmental Science 1.00-12.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

BIOL 489LS Biology Elective Lab Science 1.00-12.00
Transfer credits ONLY from another accredited institution not equivalent to a UW-Superior course.

BIOL 491 Senior Research 1.00-4.00
A course developed in cooperation with faculty or area research laboratories designed to provide students with practical experience in experimental biology. Candidates for this course must outline a research problem and complete a Contract for Independent Learning prior to registration. (May be repeated for a total of four credits.) Instructor consent required. May be used to satisfy Senior Experience requirement for Biology major.
Typically Offered:
- On-campus: Fall & Summer;

BIOL 496 Internship 1.00-4.00
On-the-job experience with local agencies (e.g. Wisconsin DNR) that provides students with opportunities to apply their skills to practical problems. In collaboration with a faculty sponsor, students must complete a Contract for Independent Learning prior to registration. May be used to satisfy Senior Experience requirement.
Typically Offered:
- On-campus: Fall & Spring;

BIOL 497 Senior Year Experience 1.00
This course provides instruction to develop and deliver an oral presentation in a scientific conference format to serve as a culminating experience for the Biology major. Presentation topics are connected to a capstone project completed in BIOL 491 Research in Biology or BIOL 496 Internship, either of which must be taken as a pre-requisite or co-requisite course. Meets in face-to-face format 2 hours per week.
Typically Offered:
- On-campus: Fall & Spring;