BIOB - BIOLOGY: GENERAL

BIOB 101 Discover Biology. 3 Credits
Term Typically Offered: Fall, Spring, Summer
Includes discussion of the most important concepts in biology. Lectures cover cells (structure and physiology), genetics (cellular reproduction, genes, the nature of heredity and evolution), and the diversity of life (plants, animals, microorganisms and their ecological relationships). General Education course for non-science majors.
Lecture Hours 3
Department: Sciences - Biology & Phys Sci

BIOB 102 Discover Biology Lab. 1 Credit
Term Typically Offered: Fall, Spring, Summer
Corequisite(s): BIOB 101.
Includes laboratory exercises from different areas of Biology. Introduces students to experiments designed to examine major conceptual ideas in Biology such as cells, cell reproduction, metabolism, molecular genetics, evolution, and diversity. Students currently enrolled in an online section of BIOB 101 will be given preferential access to an online section of BIOB 102.
Lab Hours 1
Department: Sciences - Biology & Phys Sci

BIOB 121 Fund of Bio for Allied Health. 3 Credits
Term Typically Offered: Fall, Spring
Includes discussion of basic biological principles, beginning with the molecules of life and ending with the evolution of the major human organ systems. Emphasizes the fields of biochemistry, cell biology, genetics, and evolution, focusing specifically on the roles they play in current human form and function. Recommended General Education course for non-science majors pursuing a career in health care.
Lecture Hours 3
Department: Sciences - Biology & Phys Sci

BIOB 123 Fund Bio: Nature of Nutrition. 3 Credits
Term Typically Offered: Fall, Spring
Addresses the core principles of biology from the perspective of nutrition science. Focuses on the roles of biological molecules in animal and plant organisms, cellular function and energy metabolism, genetic expression and mutations, evolution of mechanisms for nutrient procurement and utilization, and the human role in the food chain and its impact on the biosphere. Introduces contemporary issues such as genetically-modified organisms, microbiota and food-borne illness, and sustainability of food supplies. Recommended General Education course for non-science majors pursuing a career in education, social or health sciences, or human services.
Lecture Hours 3
Department: Sciences - Biology & Phys Sci

BIOB 160 Principles of Living Systems. 3 Credits
Term Typically Offered: Fall, Spring
Corequisite(s): BIOB 161 and CHMY 141 or CHMY 104.
Emphasizes principles of biology related to the unity of life. Covers cell structure and function, cellular metabolism and mechanisms of energy trapping, cellular reproduction, genetics, evolution, and a brief introduction to ecology, classification and biological diversity.
Lecture Hours 3
Department: Sciences - Biology & Phys Sci

BIOB 161 Principles Living Systems Lab. 1 Credit
Term Typically Offered: Fall, Spring
Corequisite(s): BIOB 160.
Includes laboratory exercises related to topics discussed in BIOB 160.
Lab Hours 1
Department: Sciences - Biology & Phys Sci

BIOB 170 Principles of Bio Diversity. 3 Credits
Term Typically Offered: Spring
Prerequisite(s): BIOB 160.
Corequisite(s): BIOB 171.
Emphasizes the diversity of life. Covers viruses, bacteria, protists, fungi, plants and animals. Focuses on eukaryotes.
Lecture Hours 3
Department: Sciences - Biology & Phys Sci

BIOB 171 Principles Bio Diversity Lab. 1 Credit
Term Typically Offered: Spring
Corequisite(s): BIOB 170.
Includes laboratory exercises related to topics discussed in BIOB 170.
Lab Hours 1
Department: Sciences - Biology & Phys Sci

BIOB 260 Cellular & Molecular Biology. 3 Credits
Term Typically Offered: Fall
Prerequisite(s): BIOB 160, BIOB 161.
Corequisite(s): BIOB 261.
Covers the molecular basis of eukaryotic cell structure and function. Topics include nuclear structure and function, intracellular compartmentalization and protein storing, membrane structure and function, signal transduction pathways, mechanisms and regulation of the mitotic and meiotic cell cycles, and tissue formation and maintenance.
Lecture Hours 3
Department: Sciences - Biology & Phys Sci

BIOB 261 Cellular & Molecular Biol Lab. 1 Credit
Term Typically Offered: Fall
Prerequisite(s): BIOB 160, BIOB 161.
Corequisite(s): BIOB 260.
Complements the lecture material presented in the corequisite.
Lab Hours 1
Department: Sciences - Biology & Phys Sci

BIOB 291 Special Topics. 1-12 Credits
Prerequisite(s): determined as needed.
Provides students with an opportunity to take courses not required in any curriculum for which there is a particular need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.
Lecture Hours 1-12
Department: Sciences - Biology & Phys Sci

BIOB 294 Seminar/Workshop. 1-6 Credits
Provides students with specific deficiencies the opportunity to take selected portions of the required Biology sequence. Lectures and laboratories to be attended, and credits to be earned are determined by biology faculty.
Lecture Hours 1-6
Department: Sciences - Biology & Phys Sci

BIOB 298 Internship/Cooperative Educ. 1-9 Credits
Provides university credit for a sophomore work experience in the area of Biology, supervised by faculty. Learning agreement must be completed prior to registration (restricted).
Department: Sciences - Biology & Phys Sci

BIOB 315 Animal Development. 3 Credits
Term Typically Offered: Fall (even years)
Prerequisite(s): BIOB 260.
Introduces the reproductive and developmental patterns in animals. Covers the embryonic and postembryonic developmental processes emphasizing cellular differentiation, the generation of form and shape, growth regulation, and developmental control mechanisms. The second half of the course emphasizes the genetic and molecular control of development, organized around our current understanding of commonly studied model organisms.
Lecture Hours 3
Department: Sciences - Biology & Phys Sci

BIOB 375 General Genetics. 3 Credits
Term Typically Offered: Spring
Prerequisite(s): BIOB 260, BIOB 261.
Corequisite(s): BIOB 376.
Covers the basic principles of genetics from both the classical and molecular point of view. Topics include Mendelian and non-Mendelian concepts, chromosome theory of inheritance, linkage and gene mapping, structure and function of DNA, regulation of gene expression, mutations and fundamentals of population genetics.
Lecture Hours 3
Department: Sciences - Biology & Phys Sci

BIOB 376 General Genetics Lab. 1 Credit
Term Typically Offered: Spring
Corequisite(s): BIOB 375.
Includes laboratory exercises related to topics in BIOB 375.
Lab Hours 1
Department: Sciences - Biology & Phys Sci

BIOB 410 Immunology. 3 Credits
Term Typically Offered: Spring (odd years)
Prerequisite(s): BIOB 260, BIOB 375, BIOB 425 is recommended.
Includes fundamentals of immuno-chemistry, cellular immunology, immunogenetics and clinical immunology. Lab required.
Lecture Hours 3
Department: Sciences - Biology & Phys Sci

BIOB 425 Adv Cell & Molecular Biology. 3 Credits
Term Typically Offered: Spring
Prerequisite(s): BIOB 375, BIOB 376, BCH 380, BCH 381 and CHMY 323.
Corequisite(s): BIOB 426.
Covers the molecular basis of gene expression and inheritance in prokaryotic and eukaryotic cells. Topics include transcription, RNA processing, translation, regulation of gene expression and DNA replication. Emphasis is placed on understanding the experimental underpinnings of molecular biology.
Lecture Hours 3
Department: Sciences - Biology & Phys Sci

BIOB 426 Adv Cell & Molecular Biol Lab. 1 Credit
Term Typically Offered: Spring
Corequisite(s): BIOB 425.
This laboratory complements the lecture material presented in the corequisite.
Lab Hours 1
Department: Sciences - Biology & Phys Sci

BIOB 487 Bioinformatics. 4 Credits
Term Typically Offered: Spring
Prerequisite(s): BIOB 260 and BIOB 375; BCH 380 recommended.
4cr. Introduces the field of bioinformatics through an overview of genomics and proteomics. Students will receive hands-on experience with biologically relevant databases, DNA sequence comparisons, structure analysis of macromolecules, phylogenetics, microarrays and proteomics. Through the integrated lab, students will be introduced to the development and implementation of experimental design. Data generated in lab will be used to provide real world examples correlated to topics covered in the Bioinformatics lecture. Students will present the results and conclusions of experiments in relevant scientific formats.
Lecture Hours 3, Lab Hours 3
Department: Sciences - Biology & Phys Sci

BIOB 490 Undergraduate Research. 1-6 Credits
Prerequisite(s): Junior standing in Biology or consent of advisor.
Involves intensive study of a specific problem related to biology. A contract describing the study must be completed at the time of enrollment.
Department: Sciences - Biology & Phys Sci

BIOB 491 Special Topics. 1-12 Credits
Prerequisite(s): determined as needed.
Provides students with an opportunity to take courses not required in any curriculum for which there is a particular need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.
Department: Sciences - Biology & Phys Sci

BIOB 492 Independent Study. 1-3 Credits
Prerequisite(s): Junior standing in Biology or consent of instructor.
Provides advanced students an opportunity to explore material not covered by regular Biology courses. A contract describing the study must be completed at the time of enrollment.
Lecture Hours 1-3
Department: Sciences - Biology & Phys Sci

BIOB 494 Seminar/Workshop. 1-3 Credits
Prerequisite(s): Junior standing in Biology or consent of instructor.
Provides advanced students an opportunity to investigate intensively topics pertinent to the field of Biology.
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BIOB 495 Fieldwork. 1-3 Credits
Prerequisite(s): BIOB 170 and BIOB 171 or consent of instructor.
Provides an opportunity through summer field experience at the MSU Billings Biological Field Station or tour courses to study quantitatively and/or qualitatively the fauna and flora of ecosystems.
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BIOB 498 Internship/Cooperative Educ. 1-9 Credits
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): Consent of instructor.
V1-9cr. (1-9 other/wk) Provides university credit for a work experience in the area of Biology, supervised by faculty. Learning agreement must be completed prior to registration (restricted). Also allows students to earn credit for assisting in teaching biology laboratory classes.
Department: Sciences - Biology & Phys Sci

BIOB 499 Senior Thesis/Capstone. 1 Credit
Term Typically Offered: Fall, Spring
Prerequisite(s): Senior standing in Biology.
1cr. (1 other/wk) Integrates and synthesizes knowledge and experience developed through the various courses in the biology program. Provides students opportunities to learn about current research in various scientific fields by attendance at seminars presented by science faculty, guest speakers, or classmates. Students will learn how to present research data and/or scientific journal articles, as well as participate in discussions and critiques of scientific presentations. Also provides a forum for students to present results of independent research projects or topics as assigned.
Department: Sciences - Biology & Phys Sci