BIOLOGY (BIOLOGY)

Courses
BIOLOGY 102 Biology and Living Credits: 3
Introduction to structural organization and functional processes of living systems. For non-biology majors only. Does not count toward biology degree.
BIOLOGY 102 - MOTR BIOL 100L: Essentials in Biology with Lab

BIOLOGY 102L Biology and Living Laboratory Credit: 1
Exploration of basic biological concepts through laboratory activities requiring data collection and analysis. For non-majors only; does not count toward Biology degree requirements.
Prerequisites: BIOLOGY 102.

BIOLOGY 108 General Biology I Credits: 3
Fundamental studies in biology emphasizing the unity and diversity of life. Topics include the basic chemistry of biological processes, cell types and organelles, energy harvesting and energy producing pathways, cell and life cycles, genetics, DNA structure, genes, transcription, translation, natural selection, population genetics, speciation, and phylogenetic analysis.
BIOLOGY 108L General Biology I Laboratory Credit: 1
Basic laboratory studies in Biology emphasizing the unity and diversity of life. Structure, function, heredity, development, ecology and evolution will be explored.
Co-requisites: BIOLOGY 108.

BIOLOGY 109 General Biology II Credits: 3
Fundamental studies in biology emphasizing the unity and diversity of life. Topics include prokaryotes, fungi, invertebrate-vertebrate zoology and phylogeny, human evolution, plant structure and development, animal development and physiology, ecology (population and ecosystems).
BIOLOGY 109L General Biology II Laboratory Credit: 1
Basic laboratory studies in Biology emphasizing the unity and diversity of life. Structure, function, heredity, development, regulation of growth and evolution will be explored.

BIOLOGY 115 First Year Seminar Credit: 1
This course is designed to provide students with the skills necessary to achieve success at the university. The curriculum includes time management, study, reading, note-taking and test-taking strategies, health and wellness, and student support services. Additional emphasis will include career exploration, including professionalism, writing a resume, and developing plan of study for degree completion.

BIOLOGY 122 Human Genetics Credits: 3
This is a non-majors biology course in human genetics designed for those with little classroom training in the sciences. The focus will be on the nature of human genetic variation and how variation shapes and affects our lives. This includes the structure and function of genes and how genes create traits. The discussion will focus on how genes function in human development through sex determination. The inclusion of human genomic sequencing technology and personal genomics will emphasize several issues related to knowledge and privacy.
BIOLOGY 122 - MOTR LIFS 100: Essentials in Human Biology

BIOLOGY 125L Guided Research in Biology Credits: 2
An introduction to basic principles and methods of scientific research in the biological sciences. Students will engage in experimental design, use of bioinformatic tools, molecular graphics, and specialized tools related to different biology disciplines to characterize a specific gene or cell system under the guidance of a faculty member.
Prerequisites: BIOLOGY 108, Biology major.

BIOLOGY 201 Preparing for Careers in Biology Credit: 1
This course will help students prepare for their post-undergraduate future. Topics will include communication, skills identification and marketing, how to find employment or internship opportunities, a review of the application process for graduate education and the role of undergraduate research.
Prerequisites: Sophomore standing
BIOLOGY 202 Cell Biology Credits: 3
Basic concepts of cellular and subcellular structure and function, including supramolecular and organelle structure and organization, bioenergetics, cell growth and cellular communication.

BIOLOGY 203 Essential Cell Biology Credits: 3
Foundations of cellular functions. Serves as a bridge between biochemistry and cell and organ physiology for dental students. Applications of fundamental principles to the physiology and pathology of the oral tissues will be stressed.

BIOLOGY 206 Genetics Credits: 3
A modern approach integrating molecular and organismal studies of the general genetics of lower and higher organisms. Chromosomal structure and function, gene transmission, heredity, plasticity and population genetics will be discussed.
Prerequisites: BIOLOGY 108, BIOLOGY 109, CHEM 212R.

BIOLOGY 302 General Ecology Credits: 3
Introduction to the study of populations, communities, and ecosystems by examining the interrelationships between living organisms and their environments. The role of natural selection and evolution will also be considered.
Prerequisites: BIOLOGY 108, BIOLOGY 109 (or BIOLOGY 102).

BIOLOGY 302L Ecology Laboratory Credits: 2
This course provides laboratory and field experience in ecology. The course will cover topics including statistical analysis and data presentation, terrestrial and aquatic sampling, experimental design and scientific writing.
Co-requisites: BIOLOGY 302.

BIOLOGY 303 Invertebrate Zoology Credits: 3
Taxonomy, evolutionary relationships, behavior, reproduction, morphology and ecology of the invertebrates.
Prerequisites: BIOLOGY 108, BIOLOGY 109, CHEM 212R.

BIOLOGY 305 Marine and Freshwater Biology Credits: 3
Introduction to the study of marine ecology, deep-sea biology, oceanic nekton, inter-tidal ecology, estuaries, mangroves and salt marshes, as well as ecology of rivers, lakes, streams, wetlands and human impact on aquatic habitats.
Prerequisites: BIOLOGY 108, BIOLOGY 109, CHEM 211.

BIOLOGY 308 Vertebrate Zoology Credits: 3
Taxonomy, evolutionary relationships, behavior, reproduction, morphology and ecology of the vertebrates.
Prerequisites: BIOLOGY 108, BIOLOGY 109, CHEM 212R.

BIOLOGY 312WL Laboratory in Developmental Biology, Genetics and Cell Biology Credits: 3
Experimental studies of genetics and development in selected eukaryotic model organisms with an emphasis on the molecular and cellular mechanism of inheritance.
Prerequisites: LS-BIOC 441.
Co-requisites: BIOLOGY 409.

BIOLOGY 314 Entomology Credits: 3
Anatomy, physiology and identification of insects with emphasis on their environmental adaptations.
Prerequisites: BIOLOGY 109 (or LS-ANATO 219).

BIOLOGY 319 Global Health: New and Emerging Infectious Diseases Credits: 3
This course will discuss infectious diseases that are newly identified, or increasing in prevalence throughout the world. Several aspects of each disease will be discussed, including transmission, symptoms, treatment, prevention, and diagnosis. The course is meant for students interested in a health-related career (medicine, dental, pharmacy, public health), but other students with a basic biology background are welcome.
Prerequisites: BIOLOGY 108, BIOLOGY 109 (or BIOLOGY 102).

BIOLOGY 322 General Parasitology Credits: 3
Parasitic protists, worms and arthropods and the disease states they may induce, will be examined in relationship to human, animal and plants hosts.
Prerequisites: BIOLOGY 109 (or LS-ANATO 219).

BIOLOGY 326 Biological Conservation Credits: 3
Applications of ecology and genetics to the conservation of communities and individual species, including discussion of the Endangered Species Act, extinction processes, and the effects of habitat fragmentation.
Prerequisites: BIOLOGY 108, BIOLOGY 109.
BIOLOGY 327 Biogeography and Biodiversity Credits: 2
Evolutionary and climatological effects on the geographic distribution of organisms, including areas of endemism as well as preservation of biodiversity.
Prerequisites: BIOLOGY 108, BIOLOGY 109.

BIOLOGY 328 Histology Credits: 2
Animal tissues and their specialization in the organism, with major emphasis on higher organisms.
Prerequisites: BIOLOGY 109, BIOLOGY 202, CHEM 212R.

BIOLOGY 328L Laboratory in Histology and Cellular Ultrastructure Credits: 3
Examination of structure/function relationships at the subcellular, cellular and organ levels. Both plants and animals will be examined with emphasis on vertebrates.
Prerequisites: BIOLOGY 202, BIOLOGY 328.

Co-requisites: CHEM 212R.

BIOLOGY 328WL Laboratory in Histology and Cellular Ultrastructure Credits: 3
Examination of structure/function relationships at the subcellular, cellular and organ levels. Both plants and animals will be examined with emphasis on vertebrates.
Prerequisites: BIOLOGY 202, CHEM 212R.

BIOLOGY 329 Endocrinology Credits: 3
Study of the physiological functions and controls in human and related mammalian systems, with emphasis on endocrine-directed processes that underlie normal and abnormal metabolic and clinical conditions. The course will be presented in traditional lecture format, and focus on the molecular, chemical, membrane and cellular basis of metabolic homeostatic processes in cells, cytoplasmic compartments and primary organ systems.
Prerequisites: BIOLOGY 202.

Co-requisites: LS-PHYS 316.

BIOLOGY 331 Reproductive Biology Credits: 2
Comprehensive overview of current concepts and knowledge regarding male and female reproductive processes, from gametogenesis through early placentation. Includes structural, developmental, physiological and pathophysiological aspects of reproduction.

BIOLOGY 338L Comparative Vertebrate Anatomy Laboratory Credits: 3
This class explores anatomical similarities and differences that exist between the major vertebrate groups and relates aspects of anatomy to evolutionary history and function. Students will gain hands-on experience of anatomy through dissection and examination of several model vertebrates.
Prerequisites: BIOLOGY 108, and BIOLOGY 109, and BIOLOGY 109L.

BIOLOGY 344 Bioorganic Structure and Biomolecular Function Credits: 3
An introduction to chemical and physical properties of complex biological macromolecules and their functions in living cells. Nomenclature, functional groups, reactions and stereochemistry are among the topics to be emphasized.
Prerequisites: BIOLOGY 109, CHEM 320, CHEM 322R.

BIOLOGY 346 Plant Biology Credits: 3
An integrative study of growth, development, and reproduction of plants, including structure and function of plant tissues and organs, as well as a survey of the recent advances in genetic engineering, plant defense mechanisms, and medical botany and the usefulness of plants to humans.

BIOLOGY 350 Assisting Undergraduate Learning in Biology Credits: 1-3
This course addresses current issues and pedagogy of teaching biology and providing instructional support for designated undergraduate courses in the School of Biological Sciences. Students meet weekly with the course instructor and assist in the classroom, studio, or laboratory.
Prerequisites: BIOLOGY 108, BIOLOGY 109, BIOLOGY 202, BIOLOGY 206.

BIOLOGY 385 Special Topics Credits: 1-3
In depth exploration of a topic in biology. Repeatable toward the major only when the topic changes.

BIOLOGY 395 Introduction to Evolution Credits: 3
Discussion of the biological processes that produce organic diversity through phyletic change, including variation, mutation, adaptation, population genetics, natural selection, genetic drift, gene flow, and macroevolution.
Prerequisites: BIOLOGY 206.
BIOLOGY 409 Developmental Biology Credits: 3
Principles of development and differentiation of structure during embryology in animals. Molecular, cellular and organismal level concepts and mechanisms will be considered.
**Prerequisites:** BIOLOGY 202, BIOLOGY 206.

BIOLOGY 415 Pathophysiology Credits: 3
Pathophysiology will focus on the physiological basis of cellular and tissue function, and the consequences of dysregulated metabolic/cellular expression on essential homeostatic processes in cells, cytoplasmic compartments and primary organ systems.
**Prerequisites:** LS-PHYS 316.

BIOLOGY 427 Plant Physiology Credits: 3
A study of the biochemical and physical processes involved in plant function at the molecular and cellular level and the mechanisms by which plants respond to environmental challenges.
**Prerequisites:** BIOLOGY 202, BIOLOGY 206, LS-BIOC 441.

BIOLOGY 442 Neurobiology Credits: 3
Neurobiology will consist of the presentation of theory and data concerning cellular and molecular fundamentals of the nervous system, synaptic mechanisms, sensory-motor systems, and higher-order functions of the nervous system.
**Prerequisites:** LS-BIOC 441 or LS-PHYS 316.

BIOLOGY 445 Evolutionary Ecology Credits: 3
This class explores the scientific concepts and methods underpinning modern understanding of evolutionary ecology as it relates to organisms. Students will gain hands-on experience using techniques that are central to quantitative and qualitative studies of organismal evolutionary ecology.
**Prerequisites:** BIOLOGY 302, BIOLOGY 405.

BIOLOGY 485 Special Topics Credits: 1-3
In depth exploration of a topic in biology. Repeatable toward the major only when the topic changes.

BIOLOGY 498WI Critical Analysis of Biological Issues Credits: 3
Reading and analysis of scientific literature, including original papers, on a topic of broad biological interest. Critical discussion of experimental methods and results. Writing of scientific reviews and a term paper. Taking the MFAT test is a requirement of this course, and the course satisfies the general education synthesis requirement.
**Prerequisites:** BIOLOGY 108, BIOLOGY 109, BIOLOGY 202, BIOLOGY 206, CHEM 320 (or CHEM 322R), RooWriter.

BIOLOGY D285 Special Topics Credits: 1-3
In depth exploration of a topic in biology