

BIOLOGY (BIOL)

BIOL-141 General Biology 3 Credits

Corequisites: BIOL-142

Prerequisites: None

This course serves as a general biology course. It will cover topics including basic biochemistry, cells, cell division, classification of organisms, populations, communities, and biomes. The life cycles and biology of single-cell and multicellular organisms will also be covered.

Lecture: 3, Lab 0, Other 0

BIOL-142 General Biology Lab 1 Credits

Corequisites: BIOL-141

Prerequisites: None

This course serves as a general biology laboratory. It will provide hands-on experience with areas of basic biology including basic biochemistry, cells, cell division, classification of organisms, populations, communities, biomes, and single-cell and multicellular organisms.

Lecture: 0, Lab 2, Other 0

BIOL-143 Biology in Modern Society 4 Credits

Prerequisites: None

Biology is the science of life, and the science permeates all aspects of our lives, ranging from the food we eat and the air we breathe to the interactions we have with others and the environments in which we live. Because of this, as well as new and developing methods on biological topics, it is important as humans in today's society that we understand the myriad of manners in which biology fits into our lives and society as a whole. To this end, we will focus on exploring our natural environment and various ways in which we, as humans, interact with the environment, historically and presently, and discuss biological, social, and environmental impacts of these interactions on the environmental and human society.

Lecture: 4, Lab 0, Other 0

BIOL-241 Human Biology 3 Credits

Corequisites: BIOL-242

Prerequisites: (CHEM-135 and CHEM-136) or (CHEM-136 and CHEM-137)

Minimum Class Standing: Freshman 2

This course serves as the second general biology course and focuses on humans. It will cover topics including basic biochemistry, cells, cell division, the organization and regulation of biological systems, human genetics and chromosomal inheritance, biotechnology, and various human organ systems.

Lecture: 3, Lab 0, Other 1

BIOL-242 Human Biology Lab 1 Credits

Corequisites: BIOL-241

Prerequisites: (CHEM-135 and CHEM-136) or (CHEM-136 and CHEM-137)

Minimum Class Standing: Freshman 2

This course serves as the second general biology laboratory. It will cover topics including basic biochemistry, cells, cell division, the organization and regulation of biological systems, human genetics and chromosomal inheritance, biotechnology, and various human organ systems.

Lecture: 0, Lab 2, Other 0

BIOL-311 Ecology 4 Credits

Prerequisites: BIOL-141

An introductory ecology course that will examine human interactions and the resulting effects of these actions on plant communities, animal communities, and the physical environment. Areas such as water, energy, agriculture, industry, recreation, and demographics are considered.

Emphasis will be placed on conservation, pollution, energy, and other contemporary concerns.

Lecture: 4, Lab 0, Other 0

BIOL-321 Biological Techniques I 4 Credits

Prerequisites: BIOL-241

An introductory laboratory course that will cover some of the most widely used experimental procedures used in the biological and biotechnological fields. Basic laboratory techniques, sterile technique, electrophoretic techniques, nucleic acid isolation, manipulation, amplification, and cloning will be covered. You will also gain familiarity with types of equipment frequently used in the biological laboratory.

Lecture: 1, Lab 3, Other 0

BIOL-331 Biological Techniques II 4 Credits

Prerequisites: BIOL-321

This course is the second of the introductory laboratory courses that will cover some of the most widely used experimental procedures used in the biological and biotechnological fields. Basic equipment/instrumentation, laboratory techniques, and sterile techniques will be reviewed. Protein/enzyme assays, purification, and analysis will be covered in detail. The student will also gain familiarity with the design of experiments.

Lecture: 1, Lab 3, Other 0

BIOL-341 Anatomy and Physiology 4 Credits

Prerequisites: (BIOL-241 and BIOL-242) or MECH-350

Minimum Class Standing: Sophomore

An introduction to Human Anatomy and Physiology. This course will cover topics including the organization and regulation of biological tissues, organs and organ systems as well as human development.

Lecture: 4, Lab 0, Other 0

BIOL-351 Genetics 4 Credits

Prerequisites: None

Minimum Class Standing: Sophomore

An introduction in the study of inheritance in all of its manifestations. Specifically, it introduces theory and problem solving in the three areas of Genetics: Classical Genetics, Molecular Genetics, and Population Genetics. Topics include Mendelian Genetics, sex-linkage and pedigree analysis, non-Mendelian patterns of inheritance, the molecular basis of inheritance and gene expression, the theory of methodology of modern DNA technologies, and population genetics and evolution.

Lecture: 4, Lab 0, Other 0

BIOL-361 Microbiology 4 Credits

Corequisites: BIOL-362

Prerequisites: BIOL-242

An introductory microbiology course comprised of topics including microbial cell structure and function, metabolism, growth and regulation, diversity, genetics, host-microbe interactions, disease and microbial ecology. This course will cover viruses, archaea, fungi, and protists but the main focus of the course will be on bacteria.

Lecture: 4, Lab 0, Other 0

BIOL-362 Microbiology Lab 3 Credits

Corequisites: BIOL-361

Prerequisites: BIOL-242

A laboratory course which covers a number of microbiological procedures and topics including microbial cultivation, isolation, and identification utilizing sterile technique. This course will cover microbial pathogenesis, sensitivity to antimicrobial agents, immunity, and the interaction of microbes with their environment.

Lecture: 0, Lab 3, Other 0

BIOL-381 Molecular Biology 4 Credits

Corequisites: BIOL-382

Prerequisites: BIOL-141 and BIOL-142

The basic theory and methodology of Molecular Biology is covered.

Concepts to be examined include how biological structure determines function, mechanisms and regulation of replication, transcription, and translation, processing of mRNA transcripts and proteins, and mechanisms underlying basic cellular activities.

Lecture: 4, Lab 0, Other 0

BIOL-382 Molecular Biology Lab 3 Credits

Corequisites: BIOL-381

Prerequisites: BIOL-141 and BIOL-142

This laboratory course serves as an introduction to methods utilized to study molecular biology. Laboratory techniques will include molecular cloning, RNA isolation, extraction, purification, and quantification, site-directed mutagenesis, and data interpretation. The course is designed for the junior level and is meant to be taken simultaneously with BIOL 381.

Lecture: 0, Lab 3, Other 0

BIOL-441 Cellular Biology 4 Credits

Corequisites: BIOL-442

Prerequisites: CHEM-351

Minimum Class Standing: Junior

An introduction to the structure and function of cells. Topics include cell motility, intracellular transport, cellular chemistry, membranes, organelles, metabolism, reproduction, and signaling.

Lecture: 4, Lab 0, Other 0

BIOL-442 Cellular Biology Lab 3 Credits

Corequisites: BIOL-441

Prerequisites: CHEM-351

Minimum Class Standing: Junior

An introduction laboratory utilizing methods to study cell biology and physiology. Laboratory techniques will include microscopy, yeast transformation, cellular assays (luminescence or ELISA), cell fractionation, Western Blotting, tissue culture, DNA transfection, and assays specific to assessment of drug activity or induction of chemical pathways. The course is designed for the senior level and is meant to be taken simultaneously with BIOL 441.

Lecture: 0, Lab 3, Other 0

BIOL-494 Research Methods 4 Credits

Prerequisites: BIOL-381 and BIOL-382

A capstone course where students design, execute, analyze and report the results of original research in collaboration with a faculty member. Students are required to give a formal presentation of their findings.

Lecture: 0, Lab 4, Other 0