BIOLOGY (BIOL)

BIOL 1011. Natural Science. (3 Credits)
Prerequisite: None. Credit Hours: (3-0-3). Topics in biology, environmental science, and medical health.

BIOL 1011K. Introduction to Biology. (4 Credits)
Prerequisites: Not open to students who are enrolled in BIOL 1107K or who have credit for BIOL 1107K. Credit Hours: (3-3-4) An introduction to fundamental unifying principles in biology. Topics covered in the course include: chemistry of life, cell structure and membranes, cellular functions (metabolism, respiration, photosynthesis, communication, and reproduction), genetics (inheritance patterns, DNA structure and function, gene expression, and biotechnology), and evolution. This course involves both lecture and lab components.

BIOL 1012K. Introduction to Biology II. (4 Credits)

BIOL 1050. Intro to Human Biology. (3 Credits)
Prerequisite: None Credit Hours: (3-0-3) An introduction to the study of the human body, the human organ systems, and heredity.

BIOL 1107K. Principles of Biology I. (4 Credits)
Prerequisite: None Credit Hours: (3-2-4) An introduction to elementary principles of biology, including cell structure, physiology of cells, bioenergetics, Mendelian genetics, molecular genetics and evolution, biological structure, classification, reproduction, development, physiology, and ecology. This course is intended for Biology majors and select other majors. If a student takes both BIOL 1107K and BOL 1111K, only one of these will count toward the AREA D science requirement.

BIOL 1108K. Principles of Biology II. (4 Credits)
Prerequisite: BIOL 1107K Credit Hours: (3-2-4). A second course in a two-semester sequence covering elementary principles of biology. This course is intended for Biology majors and selected other majors. If a student takes both BIOL 1108K and BIOL 1112K, only one will count toward the AREA D science requirement.

BIOL 1111K. Introductory Biology I. (4 Credits)
Prerequisite: Not open to students who are enrolled in BIOL 1107K or who have credit for BIOL 1107K Credit Hours: (3-2-4) General topics to be covered include cell structure and function, cell division, plant and animal energy pathways, genetics, and evolution. This course is intended for non-science majors only. If a student takes both BIOL 1111K and BIOL 1107K, only one of these will count toward the AREA D science requirement. The other may be used in Area B.

BIOL 1112K. Introductory Biology II. (4 Credits)
Prerequisites: BIOL 1111K or BIOL 1107K; not open to students who have credit for BIOL 1108K Credit Hours: (3-2-4) General topics to be covered include diversity of viruses and bacteria, plant and animal classification, structure and function of major plant and animal systems and ecology. This course is intended for non-science majors only. If a student takes both BIOL 1112K and BIOL 1108K, only one of these will count toward the AREA D science requirement. The other may be used in AREA B.

BIOL 2100. Science Communications. (2 Credits)
Prerequisites: Grade of C or better in each of the following courses: BIOL 1107, BIOL 1108 or 1108H, MATH 1111 or MATH 1113, and ENGL 1101 or 1101H. Credit Hours: (2-0-2) An introduction to scientific literature, experimental design, and research methods in the biological sciences. This course will address computer and research skills utilized in the biological sciences and related fields. Topics will include effectively searching scientific literature, evaluating primary research articles, the scientific method and experimental design, collecting and analyzing data, scientific writing skills, bioethics and plagiarism, effective presentation methods, and an overview of the peer review process. This course is designed for freshman and sophomore Biology majors.

BIOL 2150. Basic Laboratory Practices. (2 Credits)
Prerequisites: Grade of C or better in both BIOL 1107K and BIOL 1108K Credit Hours: (0-2-2) This course will serve to introduce students to biological laboratory practices. Topics covered will include basic laboratory practices, laboratory safety procedures, and basic cell culture techniques.

BIOL 2150K. Basic Laboratory Practices. (2 Credits)

BIOL 2210K. Anatomy & Physiology I. (4 Credits)
Prerequisites: Completion of a 4-credit hour Area D Lab Science Course with a grade of "C" or better. Credit Hours: (3-2-4). An introduction to elementary principles of anatomy and physiology of humans, including biological cytology, histology, and integumentary, musculoskeletal, and nervous systems.

BIOL 2211K. Anatomy & Physiology II. (4 Credits)
Prerequisite: Grade of C or better in BIOL 2210K Credit Hours: (3-2-4) A second course in a two-semester sequence covering elementary principles of anatomy and physiology.

BIOL 2251K. Anatomy & Physiology I. (4 Credits)
Prerequisite: Completion of a 4-credit hour Area D lab science course with a grade of C or better Credit Hours: (3-2-4) This integrated lecture and laboratory course is the first course in a two-semester sequence designed to explore the biological and chemical processes underlying the structure and function of the human body at the cellular, tissue, organ, and whole-body level. Topics to be covered include, but are not limited to, biological chemistry; cellular structure and function; tissues; and the integumentary, skeletal, muscular, and nervous systems. This course includes laboratory exercises that supplement the material covered in the lectures. This course is designed primarily for non-biology majors, especially those pursuing majors in nursing and allied health professions.

BIOL 2252K. Anatomy & Physiology II. (4 Credits)
Prerequisite: Grade of C or better in BIOL 2251K Credit Hours: (3-2-4) This integrated lecture and laboratory course is the second course in a two-semester sequence designed to explore the biological and chemical processes underlying the structure and function of the human body at the cellular, tissue, organ, and whole-body level. Topics to be covered include, but are not limited to, the cardiovascular, endocrine, lymphatic and immune, respiratory, digestive, urinary, and reproduction systems. Metabolism and fluid, electrolyte, and acid-base balance will also be covered. This course includes laboratory exercises that supplement the material covered in lectures. This course is designed primarily for non-biology majors, especially those pursuing majors in nursing and the applied health professions.

BIOL 2260K. Foundations of Microbiology. (4 Credits)
Prerequisite: BIOL 1107K or BIOL 2251K Credit Hours: (3-3-4) This integrated lecture and laboratory course provides an introduction to microbiology. This course introduces the student to the diversity and classification of medically significant microorganisms, their modes of pathogenesis and transmission, and the infectious diseases they cause. Topics to be covered include, but are not limited to, microbial cell biology and genetics; major classes of disease-causing microorganisms; host immune response; microbial control; aseptic technique; disinfection; and isolation, culture, staining, and identification of microorganisms. Select laboratory exercises will provide training in the basic laboratory techniques for culture and identification of microbes. This course is designed primarily for non-biology majors, especially those pursuing majors in nursing and the allied health professions.

BIOL 2295. Special Research Topics. (1 Credit)
Prerequisite: BIOL 1107K and/or BIOL 1108K. Credit Hours: (0-3-1). Faculty guided student research utilizing laboratory, library, or computer resources.

BIOL 3100. Biochemistry. (3 Credits)
Prerequisite: Grade of C or better in CHEM 2401K Credit Hours: (3-0-3) Introduction to the principles of biological chemistry. Concepts covered include the structure and function of biomolecules, enzyme kinetics, metabolic processes and bioenergetics.

BIOL 3200K. Genetics. (4 Credits)
Prerequisites: Grade of C or better in BIOL 1107K, BIOL 1108K, and CHEM 1211K Corerequisites: CHEM 2401K Credit Hours: (3-3-4) Study of fundamental principles of genetics including classical, molecular, population, and cytogenetics. This course includes the structure, function, regulation, and transmission of hereditary materials in viruses, prokaryotes, and eukaryotes. The laboratory exercises will represent the major methods and techniques used in both classical and molecular genetics.

BIOL 3200L. Genetics Lab. (0-1 Credits)

BIOL 3300K. Cellular & Molecular Biol. (4 Credits)
Prerequisite: Grade of C or better in BIOL 1107K, BIOL 1108K, and CHEM 1211K Credit Hours: (3-3-4) Introduction to the cellular and molecular basis of biology. Key concepts covered will include function, structure, development, and interaction of cells at the molecular level. The laboratory exercises will represent the major methods and techniques used in modern cellular and molecular biology.

BIOL 3300L. Cellular & Molec Biol Lab. (0-1 Credits)

BIOL 3340K. Microbiology. (4 Credits)
Prerequisite: Grade of C or better in BIOL 1107K, BIOL 1108K, and CHEM 1211K Credit Hours: (3-3-4) A study of prokaryotes, unicellular eukaryotic organisms, and viruses, emphasizing morphology, physiology, control, identification, symbiotic relationships, evolution and practical applications. Immunology is studied as a response of vertebrates to microbial infection. The laboratory emphasizes basic microbiological methods of culture and identification of microorganisms. The role of microbes in the environment and in medicine is also investigated.

BIOL 3500. Ecology. (4 Credits)
Prerequisite: Grade of C or better in BIOL 1107, BIOL 1108, CHEM 1211K Credit Hours: (3-3-4) Study of relationships between the biotic and abiotic at the individual, population, community, and ecosystems levels. Topics include species diversity, population dynamics, organization and classification of communities, and chemical and energy flows in ecosystems. The laboratory exercises will emphasize experimental design, sampling and collection procedures in field studies, and statistical analysis of data. Off-campus field studies may be required.

BIOL 3500K. Ecology. (4 Credits)
Prerequisite: Grade of C or better in BIOL 1107K, BIOL 1108K, and CHEM 1211K Credit Hours: (3-3-4) Study of relationships between the biotic and abiotic at the individual, population, community, and ecosystems levels. Topics include species diversity, population dynamics, organization and classification of communities, and chemical and energy flows in ecosystems. The laboratory exercises will emphasize experimental design, sampling and collection procedures in field studies, and statistical analysis of data. Off-campus field studies may be required.

BIOL 3510. Conservation Biology. (3 Credits)

BIOL 3510K. Conservation Biology. (4 Credits)
This course examines the scientific principles and practices of conserving biological diversity across genes, species, and ecosystems. Topic include extinction processes, habitat loss, population viability, and conservation strategies in terrestrial and aquatic systems. Emphasis is placed on applied problem-solving and evidence-based decision-making.

BIOL 3520K. Invertebrate Zoology. (4 Credits)
Prerequisite: Grade of C or better in BIOL 1107K, BIOL 1108K, and CHEM 1211K Credit Hours: (3-3-4) Study of invertebrate organisms with emphasis on phylogeny, comparative morphology and physiology, behavior, and eology. Labs may include field studies both on-campus and off.

BIOL 3550K. Vertebrate Zoology. (4 Credits)
Prerequisite: Grade of C or better in BIOL 1107K, BIOL 1108K, and CHEM 1211K Credit Hours: (3-3-4) Study of vertebrate organisms with emphasis on phylogeny, comparative morphology and physiology, behavior, and ecology. Labs may include field studies, both on and off campus.

BIOL 3560K. Oceanography. (4 Credits)
This course is an introduction to marine science. Biological concepts will be reviewed in light of the marine environment with specific emphasis on physical properties of seawater, movement of ocean waters, plate tectonics, organism structure and function, ecosystem composition, marine resources, and human impacts on the ocean.

BIOL 3570K. Limnology. (4 Credits)
This course will focus on various freshwater systems including streams, rivers, lakes, reservoirs, and aquifers. Specific emphasis will be placed on abiotic factors, organisms, trophic interactions, nutrient cycling, resource use, human altercation of freshwater systems, and current conservation efforts.

BIOL 3600K. Plant Biology. (4 Credits)
Prerequisite: Grade of C or better in BIOL 1107K, BIOL 1108K, and CHEM 1211K Credit Hours: (3-3-4) A broad, integrated overview of photosynthetic organisms. Topics include plant evolution and diversity, structure, function, and development, and plant ecology. Discussions include the economic and environmental impact of photosynthetic organisms. Laboratory exercises may include plant growth and development, propagation, and experiments relating to practical applications of plant biology.

BIOL 4000. Senior Seminar. (2 Credits)
Prerequisite: Completion of or concurrent enrollment in BIOL 3200, BIOL 3300, BIOL 3500, and BIOL 4200 Credit Hours: (2-0-2) A senior capstone experience integrative experience where students will apply biological theory and knowledge during the discussion and presentation of relevant topics. Demonstrated oral and written competency in the interpretation of scientific literature and research is required.

BIOL 4100. Philosophy & Ethics of Biol. (3 Credits)
Prerequisite: Grade of C or better in BIOL 1107, BIOL 1108, CHEM 1211K Credit Hours: (3-0-3) Survey of the major ethical issues relating to biological and medical research practice, as well as a discourse on the major philosophical issues of the biological sciences. This course will include oral and written discussion of scientific publications.

BIOL 4200. Evolution. (3 Credits)
Corequisite: BIOL 3200 Credit Hours: (3-0-3) Principles of evolutionary biology, including discussions of natural selection, adaptation, population genetics, speciation, and phylogeny reconstruction. The importance of the theory of evolution in all biological disciplines is emphasized. The applications of evolutionary biology in areas such as conversation biology, medicine, and agriculture are discussed. Critical analysis, discussion, and presentation of relevant literature is required.

BIOL 4350. Comparative Physiology. (3 Credits)
Prerequisite: Grade of C or better in BIOL 3200, BIOL 3300, or BIOL 3500 Credit Hours: (3-0-3) This course examines homeostatic mechanisms and general physiology of vertebrate animals. Physiological systems are explored using a comparative approach.

BIOL 4450K. Molecular Biology. (4 Credits)
Prerequistie: BIOL 3200K Credit Hours: (3-3-4) Study of macromolecular biochemistry. Emphasis will be on structure, function, and relationships of macromolecules in organisms.

BIOL 4460. Immunology. (3 Credits)
Prerequisite: BIOL 3300 required; BIOL 3340 recommended Credit Hours: (3-0-3) Study of the cells, molecules, and mechanisms of innate and adaptive defense provided against invading micro-organisms.

BIOL 4500K. Biotechnology. (4 Credits)
Prerequisite: BIOL 3200K Credit Hours: (3-3-4) Survey of methods and techniques used in modern molecular and organismal biology. Topics include advances in discovery and manipulation of genetic material, regulation of protein expression, and new techniques in population biology, agriculture, and evolutionary processes.

BIOL 4600K. Mammalogy. (4 Credits)
Prerequisite: BIOL 3500K or BIOL 3550K with a C or better Credit Hours: (3-3-4) Study of the classification, phylogeny, natural history, economic importance, and literature of mammals on a world-wide basis. Laboratory involves identification of mammals in additiion to methods of field study, collection, and preservation, with emphasis on species occurring in Georgia. Outdoor field work and one of more overnight field trips are required.

BIOL 4700K. Developmental Biology. (4 Credits)
Prerequisite: Grade of C or better in BIOL 3200K or BIOL 3300K. Credit Hours: (3-3-4) Study of the molecular, cellular, and anatomical mechanisms involved in the patterning and development of body axes, tissues, organs, and organ systems during vertebrate embryonic development. Special emphasis will be placed on medical implications of human development, environmental implications on development, and developmental mechanisms of evolutionary change.

BIOL 4750. Principles of Virology. (3 Credits)
Prerequisites: Grade of C or better in BIOL 3300 and BIOL 4200 Credit Hours: (3-0-3) An examination of the principles and applications of virology. Topics covered in this course will include virological methods, virus structure, virus transmission, virus replication, the outcomes of viral infection, classification of viruses, and viral diversity.

BIOL 4900. Special Topics in Biology. (3 Credits)
Prerequisite: BIOL 3200 and three other upper level BIOL courses, excluding BIOL 4905 Credit Hours: (3-0-3) Selected special or current topics of interest to faculty and students.

BIOL 4901K. Special Topics in Bio w/ Lab. (4 Credits)
Prerequisite:BIOL 3200K and three other upper level BIOL courses, excluding BIOL 4905 Credit Hours: (3-2-4) Selected special or current topics of interest to faculty and students containing a laboratory component. Students may be required to do field work.

BIOL 4905. Undergrad Research Biology. (2-4 Credits)
Prerequisite: Grade of C or better in BIOL 1107, BIOL 1108, and CHEM 1211K Credit Hours: 2-4 credit hours (0-6-2) or (0-9-3) or (0-12-4) Independent research under the supervision of a faculty mentor. Includes literature review, laboratory project, and presentation of results.

BIOL 4910. Biology Internship. (1-5 Credits)
Prerequisite: Grade of C or better in BIOL 1107, BIOL 1108, and CHEM 1211K and approval of Biology Internship Coordinator and Biology Department Head Credit Hours: 1 - 5 Credit Hours (0-3-1) or (0-6-2) or (0-9-3) or (0-12-4) or (0-15-5) A supervised work experience program at a previously-approved business, organization, or government entity. This course is intended for junior- or senior-level biology students. May be repeated to total no more than 10 hours of credit.