

# General Biology (GBIO)

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## GENERAL BIOLOGY (GBIO)

106 [111]. Introduction to Biological Principles I. Credit 3 hours. A survey of the fundamental principles and concepts of biology including biochemistry, cell biology, metabolism, photosynthesis, cell division, reproduction, genetics, molecular biology, development, evolution, and ecology. This would be the first course in a sequence which satisfies the General Education Sequence requirement in the Natural Sciences. Three hours of lecture per week. Persons majoring in Biology may not use this course to fulfill their major requirements. However, it may be used to fulfill an elective requirement and in calculating overall averages.

109. Laboratory for Introduction to Biological Sciences I. Credit 1 hour. Laboratory exercises will demonstrate the fundamental principles and concepts of biology including biochemistry, cell biology, metabolism, photosynthesis, cell division, reproduction, genetics, molecular biology, development, evolution, ecology, taxonomy, diversity, systems and architecture of these organisms. This laboratory may be taken with GBIO 106 if a curriculum requires four hours in the sciences. Two hours of lab per week. Persons majoring in Biology may not use this course to fulfill their major requirements. However, it may be used to fulfill an elective requirement and in calculating overall averages.

107 [112]. Introduction to Biological Principles II. Credit 3 hours. Prerequisites: GBIO 106 [111] or consent of the Department Head. A course which relates to the broad biological principles covered in GBIO 106 to specific groups of organisms. Emphasis will be placed on taxonomy, diversity, systems and architecture of these organisms. Three hours of lecture per week. Persons majoring in Biology may not use this course to fulfill their major requirements. However, it may be used to fulfill an elective requirement and in calculating overall averages.

110. Laboratory for Introduction to Biological Sciences II. Credit 1 hour. Laboratory exercises will demonstrate the fundamental principles and concepts of biology including biochemistry, cell biology, metabolism, photosynthesis, cell division, reproduction, genetics, molecular biology, development, evolution, ecology, taxonomy, diversity, systems and architecture of these organisms. This laboratory may be taken with GBIO 107 if a curriculum requires four hours in the sciences. Two hours of lab per week. Persons majoring in Biology may not use this course to fulfill their major requirements. However, it may be used to fulfill an elective requirement and in calculating overall averages.

151. General Biology I. Credit 3 hours. Prerequisites: Must be eligible to enroll in ENGL 101 and MATH 160. Principles of biology from the cellular level including biochemistry, cell biology, metabolism, photosynthesis, molecular biology, and genetics. This course is designed for students planning to major in biology or related discipline. Three hours lecture per week.

152. General Biology Laboratory I. Credit 1 hour. Prerequisite: Registration for or prior credit for GBIO

151. Laboratory exercises for studying the principles of biology from the cellular level including biochemistry, cell biology, molecular biology, and genetics. Two hours of laboratory per week.

153. General Biology II. Credit 3 hours. Prerequisite: Completion of GBIO 151 with a grade of "C" or better. A systematic study of the structure, function, evolution, ecology and relationships of organisms including viruses, bacteria, protists, fungi, plants, and animals. This course is designed for students planning to major in biology or related discipline. Three hours lecture per week.

154. General Biology Laboratory II. Credit 1 hour. Prerequisite: Registration for or prior credit for GBIO 153. Laboratory exercises for systematically studying the structure, function, evolution, ecology, and relationships of organisms including protists, fungi, plants and animals. Two hours of laboratory per week.

200. Cell Biology. Credit 3 hours. Prerequisites: Eight hours of Biology and Chemistry 121-122 or equivalent. A basic course emphasizing the study of the energetics of biological systems, including the manner in which cells obtain and expend energy: the synthesis and degradation of macromolecules with emphasis on proteins and nucleic acids. Three hours of lecture per week.

203. Selected Topics in Biology. Variable credit 1-4 hours. Prerequisite: Permission of the Department Head. Selected topics in biology that are new or unique and are not covered in existing courses. May be taken more than once for credit.

281. Environmental Awareness. Credit 3 hours. Prerequisite: GBIO 153 and BIOL 154 or equivalent. A broad spectrum study of the ecological problems of our society. Three hours of lecture per week.

312. Genetics. Credit 3 hours. Prerequisite: Six hours of mathematics, eight hours of chemistry, and eight hours of biology. Recommend: Completion of Math 161 or 164 and 162 and one course of Organic Chemistry. A study of fundamental hereditary mechanisms and relationships. Emphasis is placed on nucleic acids and the molecular and cytological roles by which genes are distributed and expressed.

314. Genetics Laboratory. Credit 2 hours. Prerequisite: Registration in or prior credit for General Biology 312. A series of experiments designed to illustrate the principles of genetics. Four hours of laboratory per week.

377. Applied Biostatistics. Credit 4 hours. Prerequisite: Mathematics 161 or consent of the Department Head. Basic concepts of biostatistics and sampling strategy; measures of central tendency and dispersion; Z, t, chi-square, and F distributions; test of hypothesis, error rates, and maximizing power; analysis of variance and regression. Strong emphasis on, and many examples of, field and laboratory oriented biological research problems. Three hours of lecture and two hours of laboratory per week.

395. General Ecology. Credit 3 hours. Prerequisite: Two semesters of biological sciences. The biology

of ecosystems: energy; patterns of ecosystems, and populations, interspecies interactions, diversity and development. Three hours of lecture per week.

402/502. Evolutionary Biology. Credit 3 hours. Prerequisite: 12 hours of biology and Junior standing or consent of instructor and Department Head. Evolution is the central unifying concept of biology. Historical development of evolutionary thought. Natural selection studied in the context of new ideas regarding punctuated equilibrium, macroevolution and extinction. Origin and evolution of the kingdoms of living organisms.

404/504. Ecological Methods. Credit 3 hours. Prerequisite: Credit for General Biology 377 or equivalent and credit for General Biology 395. An introduction to exploratory and experimental ecology with an emphasis on experimental design, sampling strategy, ecological indices, population dynamics, and simulation modeling. Two hours of lecture and two hours of laboratory per week.

406/506. Wetland Ecology. Credit 4 hours. Prerequisite: Twelve hours of Biology and Junior standing. A study of wetland ecosystems considering productivity and salinity variations with an emphasis on the interface of aquatic and terrestrial environments. Two hours of lecture and four hours of laboratory per week.

439/539. Introduction to Fresh Water and Estuarine Biology. Credit 4 hours. Prerequisites: GBIO 153 and BIOL 154 or equivalent and Junior standing or consent of the Department Head. A consideration of fresh water lakes and streams and estuaries as biological habitats and of the organisms which inhabit these environments. Attention will be given to limnology and the ecology of these areas. Two hours of lecture and one four-hour laboratory per week.

441. Biology Seminar. Credit 1 hour. Prerequisite: Junior standing in Biology. A study of the recent literature in biological sciences. May be repeated for maximum credit of two hours.

442/542. Marine Biology. Credit 4 hours. Prerequisites: GBIO 153 and BIOL 154 or equivalent and Junior standing or consent of the Department Head. A consideration of the sea as a biological environment, of the organisms which inhabit the sea, and of the interrelationships existing between marine organisms and the physical, chemical, and biological aspects of their environments. Two hours of lecture and four hours of laboratory per week.

450. Research Problems. Credit 1 to 4 hours. Prerequisite: Junior standing in Biology or consent of the Department Head. Maximum credit four hours.

459/559. Radiation Biology. Credit 3 hours. Prerequisite: Junior standing or consent of the Department Head. A study of the physical theory of radiations important to living organisms with emphasis on ionizing radiations (X-rays, gamma rays, alpha, beta, and neutron radiation). Three hours of lecture per week.

481/581 Biogeography. Credit 3 hours. Prerequisites: 12 hours of biology and Junior standing or consent of instructor and Department Head. Examines the distribution of organisms. A study of the patterns and processes of organism distribution from theoretical and empirical perspectives. Three hours of lecture per week.

485/585. Conservation Biology. Credit 4 hours. Prerequisites: 12 hours of Biology and Junior standing. Recommended: General Biology 312 and 395. An examination of threats and disruptions to biological systems from the level of populations through ecosystems to global systems. Emphasis on basic principles of ecology, evolution, and genetics as they apply to conservation theory and practice. Three hours of lecture and two hours of laboratory per week.

489/589. Biology of the Chihuahuan Desert. Credit 4 hours. Prerequisites: GBIO 153 and BIOL 154 or equivalent and Junior standing. A 15-day field trip to the Chihuahuan Desert of West Texas and Northern Mexico. Zoological, botanical and geological considerations with emphasis on taxonomy, ecology, and paleontology of Brown, Comanche, and Brewster Counties, Texas. Fifteen hours of lecture and 99 hours of laboratory.

492/592. History of Biology. Credit 3 hours. Prerequisite: Twenty hours of biology or permission of the Department Head. A general survey of the historical development theories of biological sciences from early man to the present.

493/593. Special Topics in Biology. Credit variable, 2-4 hours. Selected topics in Biology that are new or unique and are not covered in existing courses. This course may be repeated for credit if different topics are studied.

495/595. Biological Electron Microscopy. Credit 4 hours. Prerequisite: Junior standing and consent of the Department Head. Methods of studying biological material with transmission electron microscopes; fixation, ultramicrotomy and cytochemistry; replica and shadowing; and other biological related procedures. Two hours of lecture and four hours of laboratory per week.

498/598. Biological Science for Teachers. Credit 3 hours. A course designed for secondary and/or primary school teachers. Emphasis will be placed on developing the underlying scientific principles being presented in the classroom. Three hours of lectures and demonstrations per week. May not be used as credit toward a major in Biological Sciences.

603. Population Biology. Credit 5 hours. Prerequisites: Zoology 201 or equivalent, and General Biology 312. A synthesis of population ecology, population genetics and ethology. Four hours of lecture and two hours of recitation per week.

609. Estuarine Ecology. Credit 4 hours. Prerequisite: Eighteen hours of Biology including at least one ecology course, or consent of Department Head. A study of the estuary as an ecosystem with emphasis on the recent scientific literature on estuaries. Field studies on the Lake Maurepas/Lake Pontchartrain

estuary. Two hours of lecture and four hours of laboratory per week.

610. Biostatistics. Credit 4 hours. Prerequisites: Math 161 or consent of Department Head. An introductory course in the concept of biostatistics and sampling strategy. Topics covered include measures of central tendency and dispersion; Z, t, chi-square, and F distributions; experimental design, partitioning of variance, test of hypotheses, and maximizing power; analysis of variance and regression. Emphasis on field and laboratory research problems. Three hours of lecture and two hours of laboratory per week.

611. Advanced Biostatistics. Credit 4 hours. Prerequisites: GBIO 377 or 610 or consent of Department Head. An advanced course in biostatistics that applies concepts, terminology, and notation from basic methods course(s) to advanced statistical techniques. Students will learn the major applications of experimental design, treatment arrangements analysis of covariance multiple regression, factor analysis, discriminant analysis, cluster analysis, and system modeling. Additional concepts will be developed such as blocking, covariables, nesting, pseudoreplication, confounding, repeated measures, types of sums of squares, and optimization. Three hours of lecture and two hours of laboratory per week.

612. Limnological Methods. Credit 3 hours. Prerequisites: GBIO 153 and BIOL 154 or equivalent, and Chemistry 122-124, or consent of Department Head. A course designed to acquaint the student with the methods and techniques for the collection and analysis of aquatic and microbiological samples. One hour of lecture and three hours of laboratory per week.

615. Systematics. Credit 3 hours. Prerequisites: 12 hours of biology including GBIO 402, or consent of instructor and Department Head. Studies in philosophy, theory, and methods employed in studying biodiversity. Phylogenetics is emphasized but alternatives are examined. Extensive computer time is required for the course. Three hours of lecture per week.

616. Historical Ecology. Credit 3 hours. Prerequisites: Graduate standing in biological sciences or consent of Department Head. Currently active behavioral and ecological processes and systems all have a historical component. The historical component obfuscates the study of these processes and systems. This course examines the problem of history in studying contemporary processes and shows how to identify history by several methods. Three hours of lecture per week.

652. Molecular Biology. Credit 4 hours. Prerequisites: One year of organic chemistry, General Biology 200 and 312. An intensive study of recent findings in the field of molecular biology. Three hours of lecture and two hours of laboratory per week.

660. Graduate Research Problems. Credit 1-4 hours per semester. Maximum credit two hours.

690. Special Topics in Biology. Credit variable, 2-4 hours. Selected topics in Biology that are new or unique and are not covered in existing courses. This course may be repeated for credit if different topics are studied.

691. Graduate Seminar. Credit 1 hour. May be repeated for maximum credit of two hours.

770. Thesis. Credit 1-6 hours each semester, with 6 hours needed for graduation. The student must enroll in the thesis course each semester the thesis is in progress. The thesis is graded Pass-Fail.

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