Biology (BIO)

Biology (BIO) Courses

BIO 5001. Ethical Conduct in Research. (1-0) 1 Credit Hour.
Prerequisite: Graduate standing. This course provides a basic overview of the requirements for ethical conduct within the research laboratory. The grade report for this course is either “CR” (satisfactory completion) or “NC” (unsatisfactory completion). (Credit cannot be earned for both BIO 5001 and BIO 7413.)

BIO 5033. Biotechnology Laboratory. (0-6) 3 Credit Hours.
Prerequisite: Graduate standing. An organized course offering an introduction to routine procedures employed in the modern research laboratory.

BIO 5103. River Ecosystems. (3-0) 3 Credit Hours.
Prerequisite: Graduate standing in biology or environmental science, or consent of instructor. This course examines the physical, chemical, and biological factors that determine biodiversity and the distribution of freshwater ecosystems. Key ecological and hydrogeomorphology concepts and their application to environmental concerns are covered. Field trip required. (Same as ES 5113. Credit cannot be earned for both BIO 5103 and ES 5113.)

BIO 5113. Principles of Biochemistry. (3-0) 3 Credit Hours.

BIO 5123. Principles of Molecular Biology. (3-0) 3 Credit Hours.
Prerequisite: BIO 3513 or an equivalent. Molecular structure and function of genes and nucleic acids, and the processes of DNA replication, mutation and repair, as well as transcription and translation of genetic material. Genome projects, functional genomics and the genetic control of development will also be covered.

BIO 5133. Principles of Cell Biology. (3-0) 3 Credit Hours.
Prerequisites: BIO 3513 and BIO 3813, or their equivalents. Basic structure, organization and differentiation of cells. Cell cycle, signaling, growth and movement of cells, as well as cellular immunology and cellular aspects of infectious disease will also be covered.

BIO 5143. Advanced Nucleic Acids Laboratory. (0-6) 3 Credit Hours.
Prerequisite: BIO 3913 or an equivalent. BIO 5033 recommended. An introduction to advanced techniques of molecular biology dealing with manipulations and analyses of DNA, including preparation and analysis of genomic DNA, genomic cloning, the polymerase chain reaction (PCR), Southern blotting, DNA sequencing and computational analysis of DNA sequence data. (Formerly titled “Advanced Molecular Biology Laboratory – DNA Techniques.”)

BIO 5153. Advanced Molecular Biology Laboratory – RNA Techniques. (0-6) 3 Credit Hours.
Prerequisite: BIO 3913 or an equivalent. BIO 5033 recommended. An introduction to advanced techniques of molecular biology dealing with manipulations and analyses of RNA, including preparation and analysis of cellular RNA, cDNA cloning, the reverse transcriptase-polymerase chain reaction (RT-PCR), Northern blotting, and recovery and characterization of gene-specific cDNAs.

BIO 5163. Recombinant Protein Biotechnology Laboratory. (0-6) 3 Credit Hours.
Prerequisite: Satisfactory completion of BIO 5033. Small- to large-scale growth of microorganisms and eukaryotic cells followed by downstream processing of supernatants and/or cell pellets, protein purification and protein analysis. (Formerly BIO 7542 and BIO 7543. Credit cannot be earned for both BIO 5163 and BIO 7542 or BIO 7543.)

BIO 5173. Principles of the Biological Sciences. (3-0) 3 Credit Hours.
Principles of biochemistry, cell and molecular biology with a focus on applications and current research appropriate for secondary school and community college biology. This course is designed for prospective and in-service science teachers who need to develop a deeper understanding of central ideas in biochemistry, cell and molecular biology.

BIO 5183. Biology of Learning. (3-0) 3 Credit Hours.
The course will introduce students to the field of neuroscience by surveying areas of biology and psychology relevant to education. In particular, the course focuses on understanding the neurobiological bases of how people learn and remember.

BIO 5193. Hands-On Scientific Learning. (0-6) 3 Credit Hours.
An introduction to the practical application of a variety of cell and molecular biology techniques. This course is intended to provide laboratory experience in selective aspects of modern biotechnology and their applications appropriate for Science Educators.

BIO 5233. Medicinal Plants. (3-0) 3 Credit Hours.
Prerequisite: Graduate standing in Biology or Chemistry. An overview of plant secondary metabolism, and the ethnobotany, biochemistry, and pharmacology of some of our most important plant-derived pharmaceuticals.

BIO 5243. Advanced Plant Ecology. (3-0) 3 Credit Hours.
Prerequisites: BIO 3283 and BIO 3292, or consent of instructor. A study of the major biomes of the world, including North America and Texas, and the factors that influence the development of these biomes. Special consideration is given to species interactions that lead to high and low density species. (Same as ES 5243. Credit cannot be earned for both BIO 5243 and ES 5243.)

BIO 5273. Global Change Biology. (3-0) 3 Credit Hours.
Prerequisite: Graduate standing or consent of instructor. Historical, present-day and future predictions of global changes in biological communities and species will be examined. Gas exchange, mating systems, phenological changes, pollination and pollinators as well as other species interactions, species diversity and species distribution will be examined. Both intrinsic and extrinsic factors influencing the changes will be scrutinized.

BIO 5363. Microbial Genetics and Recombinant DNA. (3-0) 3 Credit Hours.
Prerequisites: BIO 2313, BIO 3513, and BIO 3713, or consent of instructor. This course covers recombinant DNA and various technologies that it has spawned. It also covers those aspects of microbial genetics that directly relate to recombinant DNA. (Formerly BIO 5373. Credit cannot be earned for both BIO 5363 and BIO 5373.)

BIO 5423. Neuroanatomy. (3-0) 3 Credit Hours.
Prerequisite: Consent of instructor. The anatomy of the vertebrate nervous system.

BIO 5433. Neurophysiology. (3-0) 3 Credit Hours.
Prerequisite: BIO 3433 or an equivalent. The fundamentals of neurophysiology are presented from the cellular to the systems level.
BIO 5443. Neurochemistry. (3-0) 3 Credit Hours.
Prerequisite: BIO 3433 or an equivalent. BIO 3513 or an equivalent recommended. An introduction to the biochemical basis of synaptic transmission, and the pathological changes in synaptic transmission associated with neurobiological diseases and disorders.

BIO 5453. Neuroendocrinology. (3-0) 3 Credit Hours.
Prerequisites: BIO 3433 and BIO 3813. Anatomical and molecular neurobiology of the endocrine hypothalamus and associated organs. Morphological, cell biological, and feedback mechanisms of endocrine regulation are emphasized.

BIO 5463. Reproductive Biology. (3-0) 3 Credit Hours.
Prerequisite: Graduate standing in Biology. Mammalian reproduction including mechanisms involved in sexual differentiation, fertilization, and fetal development. Endocrine regulation and environmental influences with a focus on human reproduction.

BIO 5473. Developmental Neurobiology. (3-0) 3 Credit Hours.
Prerequisite: BIO 3433 or consent of instructor. A study of the development of the nervous system, with an emphasis on neurogenesis, neuronal migration, growth factors, axonal guidance, and the role of neuronal activity in synapse stabilization.

BIO 5483. Computational Neuroscience. (3-0) 3 Credit Hours.
Prerequisite: BIO 3433 or an equivalent. A non-mathematical approach to the computational functions of the brain, including sensory coding, neural control of movement, and the computational properties of neurons and neuronal networks.

BIO 5493. Cognitive Neuroscience. (3-0) 3 Credit Hours.
Prerequisite: BIO 3433 or consent of instructor. The biological foundations of mental phenomena, including perception, attention, learning, memory, language, motor control, and executive function, as well as functional specialization, development and plasticity, through various methodologies.

BIO 5503. Sensory Physiology. (3-0) 3 Credit Hours.
Prerequisite: BIO 5433 or consent of instructor. Principles of sensory physiology, including sensory transduction and central processing of sensory information in vertebrate and invertebrate species.

BIO 5523. Enzymes. (3-0) 3 Credit Hours.
Prerequisite: BIO 3513 or an equivalent. A study of enzyme structure and mechanism, inhibitors, cofactor, kinetics, and regulation.

BIO 5533. Human Electrophysiology. (3-0) 3 Credit Hours.
Prerequisite: BIO 3433 (or PSY 3103) recommended, or consent of instructor. The electrophysiological basis of human behavior, with an emphasis on event-related brain potentials associated with cognitive function, perception and action.

BIO 5543. Pharmacology and Toxicology. (3-0) 3 Credit Hours.
Prerequisite: Graduate standing in Biology. Mechanisms of action of major classes of therapeutic drugs. Clinical uses, drug comparisons, beneficial and adverse effects involved in clinical therapeutics.

BIO 5553. Toxicology. (3-0) 3 Credit Hours.
Prerequisite: Graduate standing or consent of instructor. The molecular mechanisms by which varied environmental toxins impact human physiological systems will be presented, including the metabolic aspects involved in chemical biotransformation. Processes by which chemical exposures induce cancers and genetic and/or developmental anomalies will be addressed. Risk assessment, food production safety issues and biological aspects of regulatory toxicology will also be discussed.

BIO 5563. Proteomics. (3-0) 3 Credit Hours.
Prerequisite: BIO 3513 or an equivalent. Protein chemistry, sequences, methods, technology, domains, folding, post-translational modifications, and biomarkers. (Formerly BIO 5593. Credit cannot be earned for both BIO 5563 and BIO 5593.)

BIO 5633. Stem Cell Biology. (3-0) 3 Credit Hours.
Prerequisite: Graduate standing in Biology. Detailed study of selected areas of developmental biology relating to cellular differentiation, including nuclear-cytoplasmic interactions, induction, and reversibility of differentiation. (Formerly titled "Cytodifferentiation.").

BIO 5643. Bioinformatics and Computational Biology. (3-0) 3 Credit Hours.
Prerequisites: BIO 2313 or an equivalent; enrollment in Biology Ph.D. program required, or permission of the Biology Department or instructor. Computational analysis of sequences, protein structures, and gene expression network on a large scale. Comparative genomics, functional genomics, and proteomics will also be covered. (Credit cannot be earned for both BIO 5643 and BIO 5623.)

BIO 5653. Biology of Disease. (3-0) 3 Credit Hours.
Prerequisites: BIO 3513 and BIO 3813, or BIO 5133. A study of molecular and cellular events associated with disease processes. Diseases to be discussed include: Alzheimer's, LDL-atherosclerosis, cancer, Duchenne muscular dystrophy, and diseases associated with defects in lysosome and mitochondrial function.

BIO 5663. Applications of Recombinant DNA Technology. (3-0) 3 Credit Hours.
A course on recombinant DNA technology, concentrating on major DNA manipulation methods, including their use in vaccine and bioactive protein production, gene therapy, plant genetic engineering along with ethical and safety considerations.

BIO 5673. Analysis of Next Generation Sequence Data. (3-0) 3 Credit Hours.
The course has two major goals: 1) A general understanding of next-generation sequencing technologies; 2) An understanding of the benefits in applying next generation sequencing technology for life sciences research. The emphasis will be on applications for microbial infectious diseases research.

BIO 5713. Ornithology. (3-0) 3 Credit Hours.
A course covering various aspects of the biology of birds, including anatomy, physiology, systematics, evolution, behavior, ecology, and biogeography. Field trips may be included. (Same as ES 5763. Credit cannot be earned for both BIO 5713 and ES 5763.)

BIO 5733. Advanced Medical Mycology. (3-0) 3 Credit Hours.
Prerequisites: BIO 3522 and BIO 3722. This course is a comprehensive study of the etiological agents and host factors that lead to fungal disease in humans.

BIO 5743. Advanced Virology. (3-0) 3 Credit Hours.
Prerequisite: Graduate standing in Biology. A detailed study of the diversity of viruses and biochemical mechanisms for their replication. (Formerly titled "Biochemical Virology.").

BIO 5753. Conservation Biology. (3-0) 3 Credit Hours.
The class topics will include the nature of the biosphere, threats to its integrity, and ecologically sound responses to these threats. Also included will be the origin and preservation of biotic diversity, how the rich variety of plant and animal life arose, how it has been maintained by natural processes, and how its destruction can be prevented. (Same as ES 5753. Credit cannot be earned for both BIO 5753 and ES 5753.)
BIO 5762. Fundamentals of Immunology for Biotechnology. (2-0) 2 Credit Hours.
An integrated examination of the principles of immunology pertaining to the Biotechnology Industry. An emphasis on current immunological techniques, including: recombinant antibody, flow cytometry and elispot technology. Issues related to vaccine production and therapeutics will also be considered.

BIO 5783. Introduction to Good Manufacturing Practices and Good Laboratory Practices. (3-0) 3 Credit Hours.
Review of FDA and U.S. Pharmacopia regulations. Practical considerations for the implementation of GMP/GLP systems; data management and reporting, as well as problem solving and interpretive skills, will be emphasized.

BIO 5971. Directed Research. (0-0) 1 Credit Hour.
Prerequisites: Admission to either the Biology or Biotechnology Master’s program or admission as a special graduate or non-degree-seeking student, and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record. The directed research course may involve either a laboratory or a theoretical problem. May be repeated for credit, but not more than 6 hours, regardless of discipline, in combination with BIO 6951-3 (Independent Study), will apply to the Master’s degree.

BIO 5972. Directed Research. (0-0) 2 Credit Hours.
Prerequisites: Admission to either the Biology or Biotechnology Master’s program or admission as a special graduate or non-degree-seeking student, and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record. The directed research course may involve either a laboratory or a theoretical problem. May be repeated for credit, but not more than 6 hours, regardless of discipline, in combination with BIO 6951-3 (Independent Study), will apply to the Master’s degree.

BIO 5973. Wildlife Management. (3-0) 3 Credit Hours.
An introduction to wildlife management including ecological principles dealing with ecosystems, natural communities, and populations. The importance of animal behavior, the availability of food, cover, wildlife diseases, predators, hunting, and trapping will be included. Field trips may be included. (Same as ES 5773. Credit cannot be earned for BIO 5793 and 5773.)

BIO 5833. Membrane Structure and Function. (3-0) 3 Credit Hours.
Prerequisite: BIO 3513 or an equivalent. A study of the composition, organization, transport functions, and permeability of natural and model membranes.

BIO 6213. Advanced Ecology. (3-0) 3 Credit Hours.
Prerequisite: BIO 3283 or an equivalent. Interaction of organisms with their environment, allelopathy, competition, distribution, succession, and factors that control growth and dispersal. Special consideration is given to the concepts of climax, succession, and land management. (Same as ES 6213. Credit cannot be earned for both BIO 6213 and ES 6213.)

BIO 6233. Quantitative Biology. (3-0) 3 Credit Hours.
Prerequisite: Graduate standing or consent of instructor. An introduction of quantitative analysis of biological data and design of experiments. Topics include probability theory and distributions; descriptive statistics; hypothesis testing and confidence intervals for means, variances, and proportions; chi-square statistic; categorical data analysis; linear correlation and regression model; analysis of variance; and nonparametric methods.

BIO 6313. Molecular Biology and Biophysics of Ion Channels. (3-0) 3 Credit Hours.
Prerequisites: BIO 5433 and BIO 5443, or permission of instructor. A study of the molecular composition and biophysical properties of ion channels. The course emphasizes three families of ion channels: voltage-gated, ligand-gated and metabolically-stimulated channels. Their structure and function will be related to how ion channels mediate cellular actions in excitable cells.

BIO 6323. Essentials of Biostatistics for Biotechnology. (3-0) 3 Credit Hours.
Basic, intermediate, and advanced (but not bioinformatics) statistical vocabulary, concepts, and methods commonly used in the biotechnology industry. A focus on tests for quality control and assurance of equipment and test systems to assess accuracy, precision, and bias related to test validations. Concepts and appropriate selections of test/study design using power analyses and estimations of sample sizes; also for clinical trials. Analytical calibration curves, frequency distributions, descriptive statistics, measures of central tendency and dispersion/error, probability, paired and unpaired, one-tailed and two-tailed t-tests, correlations, regression, one-way and two-way analysis of variance with repeated measures, parametric and nonparametric tests, post hoc tests for significance, reporting and interpretations of statistical results, validations of clinical tests for specificity, sensitivity, predictive values, likelihood ratios, receiver operating characteristic curves.

BIO 6483. Animal Behavior. (3-0) 3 Credit Hours.
Prerequisite: BIO 3413 or consent of instructor. An examination of neural, endocrine, genetic, and environmental determinants of behavior.

BIO 6513. Drug Development. (3-0) 3 Credit Hours.
Prerequisites: BIO 5113, BIO 5123 and BIO 5133. This course will provide students with an overview of the early drug discovery process, including target identification, validation, assay development and high throughput screening up to pre-clinical trials.

BIO 6543. Vaccine Development. (3-0) 3 Credit Hours.
Prerequisites: BIO 5762 and permission of instructor. This course will provide students with an overview of issues about the roles of vaccines in the control of infectious diseases, vaccine development, clinical trials and implementation of vaccine programs.

BIO 6573. Microbial Pathogenesis. (3-0) 3 Credit Hours.
The student will gain an understanding of the cellular and molecular mechanisms by which eukaryotic and viral pathogens cause disease and the host immune responses against these pathogens.
BIO 6663. Experimental Parasitology. (3-0) 3 Credit Hours.
Prerequisite: A course in parasitology or consent of instructor. A study of animal parasites, with special emphasis on the physiology of host-parasite interactions.

BIO 6803. Advanced Immunology and Immunochemistry. (3-0) 3 Credit Hours.
Prerequisite: BIO 4743 or consent of instructor. The study of current concepts of humoral and cell-mediated immunity, with emphasis on molecular mechanisms.

BIO 6883. Bacterial Pathogenesis. (3-0) 3 Credit Hours.
Prerequisites: BIO 3713 and BIO 4743, or consent of instructor. This course will present a selection of topics in the field of bacterial pathogenesis. Lectures will cover regulation of virulence; colonization and host tissue damage; vaccines, antibiotics and novel antimicrobials; evasion of the immune system; intracellular pathogens; pathogenic mechanisms of Gram-negative and Gram-positive bacteria; pathogenic mycobacteriology; and experimental tools in bacterial pathogenesis.

BIO 6951. Independent Study. (0-0) 1 Credit Hour.
Prerequisites: Graduate standing and permission in writing of the instructor and the student's Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, in combination with BIO 5971-3 Directed Research will apply to the Master's degree.

BIO 6952. Independent Study. (0-0) 2 Credit Hours.
Prerequisites: Graduate standing and permission in writing of the instructor and the student's Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, in combination with BIO 5971-3 Directed Research will apply to the Master's degree.

BIO 6953. Independent Study. (0-0) 3 Credit Hours.
Prerequisites: Graduate standing and permission in writing of the instructor and the student's Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, in combination with BIO 5971-3 Directed Research will apply to the Master's degree.

BIO 6961. Comprehensive Examination. (0-0) 1 Credit Hour.
Prerequisite: Approval of the appropriate Graduate Program Committee to take the Comprehensive Examination. Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

BIO 6963. Critical Thinking & Writing for the Biological Sciences. (3-0) 3 Credit Hours.
Prerequisites: Consent of the instructor and of the Graduate Advisor of Record. This course introduces students to writing and critiquing research proposals, manuscripts, abstracts, and scientific presentations.

BIO 6973. Special Problems. (3-0) 3 Credit Hours.
Prerequisite: Consent of instructor. An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but not more than 6 hours, regardless of discipline, may be applied to the Master's degree.

BIO 6983. Master's Thesis. (0-0) 3 Credit Hours.
Prerequisites: Permission of the Graduate Advisor of Record and thesis director. Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master's degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

BIO 7041. Biology Colloquium. (1-0) 1 Credit Hour.
Prerequisite: Graduate standing. Oral presentations, discussions, critical evaluation of students' research in progress, or discussions of current journal articles or reviews of recent scientific advances. May be repeated for credit. The grade report for this course is either “CR” (satisfactory participation in the colloquium) or “NC” (unsatisfactory participation in the colloquium). (Formerly BIO 5041. Same as ES 6941. Unless topic varies, credit cannot be earned for both BIO 7041 and ES 6941.).

BIO 7051. Seminar in Life Sciences. (1-0) 1 Credit Hour.
Prerequisite: Graduate standing. Formal presentations of research by outside authorities in the biological sciences. May be repeated for credit. The grade report for this course is either “CR” (satisfactory participation in the seminar) or “NC” (unsatisfactory participation in the seminar).

BIO 7113. Supervised Teaching in Biology. (0-0) 3 Credit Hours.
Prerequisite: Admission to candidacy for the Doctoral degree. Required course for Biology doctoral students. The student will be responsible for all aspects of leading a discussion section or laboratory course. Approval by the chair of the appropriate Doctoral Studies committee required.

BIO 7143. Principles of Biological Scientific Writing. (3-0) 3 Credit Hours.
Prerequisite: Graduate standing. This course will provide an overview of scientific grant and manuscript preparation. The class will be directed toward producing a Ph.D. dissertation proposal and a postdoctoral fellowship application.

BIO 7211. Doctoral Research. (0-0) 1 Credit Hour.
Prerequisite: Admission to either the Neurobiology or Cell and Molecular Biology Doctoral program. May be repeated for credit, but no more than 52 hours may be applied to the Doctoral degree.

BIO 7212. Doctoral Research. (0-0) 2 Credit Hours.
Prerequisite: Admission to either the Neurobiology or Cell and Molecular Biology Doctoral program. May be repeated for credit, but no more than 52 hours may be applied to the Doctoral degree.

BIO 7213. Doctoral Research. (0-0) 3 Credit Hours.
Prerequisite: Admission to either the Neurobiology or Cell and Molecular Biology Doctoral program. May be repeated for credit, but no more than 52 hours may be applied to the Doctoral degree.

BIO 7311. Doctoral Dissertation. (0-0) 1 Credit Hour.
Prerequisites: Admission to candidacy for the Doctoral degree and completion of at least 18 semester credit hours of BIO 7211-6. May be repeated for credit.

BIO 7312. Doctoral Dissertation. (0-0) 2 Credit Hours.
Prerequisites: Admission to candidacy for the Doctoral degree and completion of at least 18 semester credit hours of BIO 7211-6. May be repeated for credit.
BIO 7313. Doctoral Dissertation. (0-0) 3 Credit Hours.
Prerequisites: Admission to candidacy for the Doctoral degree and completion of at least 18 semester credit hours of BIO 7211-6. May be repeated for credit.

BIO 7413. Research Ethics and Responsible Conduct in Research.
(3-0) 3 Credit Hours.
A case-study approach to formal training in the responsible conduct of research. Includes areas of conflict of interest, responsible authorship, policies for handling misconduct, policies regarding the use of human and animal subjects, and data management. (Credit cannot be earned for both BIO 5001 and BIO 7413.).

BIO 7563. Practicum in Biotechnology. (0-0) 3 Credit Hours.
Prerequisites: Enrollment in Master’s in Biotechnology program and at least 18 hours credit including satisfactory completion of BIO 5033 and one other organized laboratory course. An internship in a Biotechnology company. Must have approval of Biotechnology Graduate Studies Committee.

BIO 7566. Practicum in Biotechnology. (0-0) 6 Credit Hours.
Prerequisites: Enrollment in Master’s in Biotechnology program and at least 18 hours credit including satisfactory completion of BIO 5033 and one other organized laboratory course. An internship in a Biotechnology company. Must have approval of Biotechnology Graduate Studies Committee.

BIO 7569. Practicum in Biotechnology. (0-0) 9 Credit Hours.
Prerequisites: Enrollment in Master’s in Biotechnology program and at least 18 hours credit including satisfactory completion of BIO 5033 and one other organized laboratory course. An internship in a Biotechnology company. Must have approval of Biotechnology Graduate Studies Committee.

BIO 7571. Experimental Techniques in Biology. (0-2) 1 Credit Hour.
Prerequisite: Consent of instructor. Topics include research methods in cell and molecular biology, molecular neurobiology, and microbiology. May be repeated for credit as topics vary. (Formerly BIO 5571-3.).

BIO 7572. Experimental Techniques in Biology. (0-4) 2 Credit Hours.
Prerequisite: Consent of instructor. Topics include research methods in cell and molecular biology, molecular neurobiology, and microbiology. May be repeated for credit as topics vary. (Formerly BIO 5571-3.).

BIO 7573. Experimental Techniques in Biology. (0-6) 3 Credit Hours.
Prerequisite: Consent of instructor. Topics include research methods in cell and molecular biology, molecular neurobiology, and microbiology. May be repeated for credit as topics vary. (Formerly BIO 5571-3.).