

Biosciences Laboratory Courses

Each course or combination of courses listed here can be taken to satisfy a laboratory course requirement for a biosciences major. Credit hours follow each course title. Required courses and available elective labs vary depending on the major field.

Required Courses

Bios 211 Introduction to Experimental Biosciences (2)

Introduction to “laboratory math,” record keeping, technical communication, selected research strategies, and methods of science, in a biological context. Taught in the first half of each semester. *** Special Registration Instructions: To register go to the course URL (<http://www.ruf.rice.edu/~bioslabs/bios211/>), select “Getting Started” then “Register” and follow instructions from there.*** Instructor permission required. Prerequisite: Current or prior enrollment in Bios 201.

Bios 213 Introductory Laboratory Module in Ecology & Evolutionary Biology (1)

Experimental, laboratory, and field studies of natural history, ecology, evolution, and animal behavior. Computer simulations of population genetics. The course begins after the mid-semester break in the Fall semester and after mid-term recess in the Spring semester. **Bios 213 is required of all biosciences majors.** It is a prerequisite for all laboratory courses offered by EEB including Bios 316, 317, and 319.

Bios 311 Advanced Experimental Biosciences (1)

Advancement of basic laboratory, record keeping, and technical communication skills. Taught first half of the semester. NOTICE: The course is closed to registration on Esther. To register, you must obtain the instructor’s signature on a Special Registration form available from the Office of the Registrar (<http://www.ruf.rice.edu/~reg/forms/index.html>). Instructor permission required. Prerequisites: Bios 211 and 301. **Bios 311 is required of all Biochemistry & Cell Biology majors (B.S. and B.A.) and is a prerequisite for all 300 level elective labs offered by BCB.** Such labs include Bios 312, 313, 314, 315, and 318.

Elective Courses

Bios 310 Independent Study for Undergraduates (variable credit)

Section 1 is Biochemistry and Cell Biology. Section 2 is Ecology and Evolutionary Biology. Program of independent study for students with previous training in the biosciences. Includes a research paper. Students are expected to spend at least three hours per week in the laboratory for each semester hour of credit. If taken for 2 or more hours, counts as one required lab course but not as a Group A or Group B course. If receiving 2 or more credits, students will be required to participate in the university annual undergraduate symposium in the spring semester. Department permission required. Prerequisite: Bios 211.

Bios 312 Experimental Molecular Biology (1)

Introduction to strategies in molecular biology and experience in preparation of a scientific poster. Taught first half of spring or second half of fall semester. NOTICE: The course is closed to registration on Esther; to register, you must get the instructor’s signature on a Special Registration form available from the Office of the Registrar (<http://www.ruf.rice.edu/~reg/forms/index.html>). Prerequisite: Bios 311.

Bios 313 Advanced Experimental Molecular Biology (1)

Team projects using microarrays to analyze gene expression; teams give a PowerPoint presentation to communicate their findings. Taught second half of the spring semester for 3 1/2 weeks. NOTICE: The course is closed to registration on Esther; to register, you must get the instructor’s signature on a Special Registration form available from the Office of the Registrar (<http://www.ruf.rice.edu/~reg/forms/index.html>). Instructor permission required. Prerequisites: Bios 311 and Bios 312 and instructor’s permission.

Bios 314 Experimental Cell Biology (1)

Application of transmission electron microscopy to research in cell biology. Students will interview a faculty investigator and design and conduct an experiment involving preparation and examination of samples for the electron microscope. Recommended for students interested in a research career. Instructor

permission is required. Meeting arrangements will be made the first week of classes. The course prerequisites are Bios 301, Bios 311 and Bios 341.

Bios 315 Experimental Physiology (1)

An instrumentation-intensive short course in membrane electrophysiology and vertebrate nerve and muscle physiology. Research reports require interpretation of laboratory data in terms of concepts at the molecular level. Starts the second half of the semester. The course prerequisites are Bios 301 and Bios 311.

Bios 316 Lab Module in Ecology (1)

Field and lab experiments in ecology. Prerequisites include Bios 323 or Bios 325 or permission of instructor.

Bios 317 Lab Module in Behavior (1)

Field experiments in behavior. Learn to formulate and test hypotheses on bird behavior using mockingbirds, grackles, and herons nesting on campus. Prerequisites include Bios 321 and Bios 213 or permission of instructor.

Bios 318 Laboratory Studies in Applied Microbiology (1)

Microbiological analysis of water, isolation, culture, observation, assay, and identification of bacteria, in the context of a simulated internship with a water/public health department. Starts the second half of the semester, self-scheduled after the first four formal meetings. Requires daily attention to cultures during the week. Limited enrollment. Prerequisite: Bios 311.

Bios 320/Bioe 342 Lab Module in Tissue Culture (1)

This course is cross listed between biosciences and bioengineering. Introduction to tissue culture techniques, including cell passage, cell attachment and proliferation assays, and a transfection assay. Sections 1 and 2 are taught during the first half of the semester. Sections 3 and 4 are taught during the second half of the semester. Section sign-up is required by the instructor in Keck 108 during preregistration week. Prerequisites: Bios 211 OR Chem 214 or permission of instructor. **NOTE: Bioe 342 is a core course for bioengineering majors. Bioengineering students must have priority for registration. Biosciences students must use the sign up procedure and should be prepared to take a different laboratory course if Bios 320 is closed.**

Bios 327 Biological Diversity Lab (1)

The course will examine (1) measures of biological diversity (taxic, molecular, and phylogenetic); the ecological and evolutionary causes of biological diversity; (3) issues regarding the contribution of biological diversity to ecosystem function. Prerequisites: Bios 201 AND Bios 202 AND Bios 213.

Bios 330 Insect Biology Lab (1)

Required lab for Bios 326. Prerequisites: Bios 201 AND Bios 202. Co-requisite: Bios 326.

Bios 337 Field Bird Biology Lab (1)

The course centers on a series of five field trips to diverse habitats for observing birds both immigrants and residents. Each will be preceded by a lecture and students will do two projects.

Bios 401/402, 403/404 Undergraduate Honors Research (5) -- see separate description.

Hons 470/471 Rice Undergraduate Scholars Program (RUSP) (3/variable) -- see description at <http://www.owl.net.rice.edu/~hons470/>.

Bios 530 Lab Module in NMR Spectroscopy and Molecular Modeling (2)

Students will learn to set up, acquire, and process one-dimensional and basic two-dimensional NMR experiments. Spectral interpretation (resonance assignment and extraction of structural information) for nucleic acids and proteins using homonuclear and heteronuclear data will be performed. Enrollment limited to 12, with priority to graduate students. Prerequisites: Bios 352 AND Bios 481 or permission of instructor.

Bios 532 Laboratory Module in Optical Spectroscopy and Kinetics (2)

Students learn the principles behind fluorescence, circular dichroism, analytical ultracentrifugation, spectroscopy and rapid kinetics by carrying out experiments with genetically engineered proteins and state-of-the-art equipment. Data will be interpreted and manipulated using curve-fitting and graphics software. Recommended prerequisites: Bios 352 or equivalent. Concurrent or previous enrollment in Bios 481.

Bios 533 Bioinformatics and Computational Biology (2)

An introduction to the emerging field of bioinformatics. A series of lectures, combined with hands-on exercises. The topics to be discussed include sequence comparison, structure analysis, phylogenetics, database searching, microarrays and proteomics. Recommended prerequisite: Bios 301.

Bios 535 Practical X-ray Crystallography (2)

This course is an introduction to macromolecular crystallography with emphasis on crystallization methods, data acquisition, processing and molecular model-building. Approaches to solving structures will be discussed, as well as refinement of molecular models. Offered second half of the semester. Recommended prerequisite: Bios 481.

20 September 2007