

HBY

Physiology and Biophysics

HBY 500: Short Term Research Projects in Physiology and Biophysics

Short term research project (rotation) under the supervision of a staff member.

Prerequisite: Must be a Graduate Students in the Dept. of Physiology & Biophysics. Spring, 1-12 credits, Letter graded (A, A-, B+, etc.)

May be repeated 4 times FOR credit.

HBY 501: Physiology

Introduces normal function of human tissues and organs and their regulation by nervous and endocrine systems. Emphasizes the organization and function of physiological control systems and the maintenance of a constant internal environment. Enrollment restricted to fully matriculated graduate students, with permission of instructor. Only Fall.

4 credits, Letter graded (A, A-, B+, etc.)

HBY 502: Medical Physiology

A graduate level approach to the physiology of the organ systems is addressed in a lecture format with emphasis on problem solving. Relevant clinical correlations are addressed at the end of each block insofar as they illustrate how symptoms and signs of disease result from disordered physiology. Organ Systems addresses the structure and function of the cardio vascular, respiratory, renal, gastrointestinal, endocrine, skeletal, reproductive, and integumentary systems.

4 credits, Letter graded (A, A-, B+, etc.)

HBY 530: Cellular Physiology and Biophysics

Cellular structure and function. Topics include ion channels, excitability, transport, energetics and metabolism, contraction, secretion, and communication within and between cells. Emphasizes quantitative analysis of cellular processes.

1-3 credits, Letter graded (A, A-, B+, etc.)

HBY 531: Medical Physiology

A graduate-level introduction to the physiology of the organ systems with ultrastructural correlations. Ultrastructural correlations are demonstrated in a laboratory setting using histological preparations in conjunction with electron micrographs illustrating the relevant ultrastructure needed to understand the normal functioning of tissues and organs. The physiology of

the major organ systems is addressed in a lecture format with the emphasis on problem solving. Relevant clinical correlations are addressed at the end of each block in so far as they illustrate how symptoms and signs of disease result from disordered physiology. Organ Systems addresses the structure and function of the cardiovascular, respiratory, renal, gastrointestinal, endocrine, skeletal, reproductive, and integumentary systems. Prerequisites: Admission to medical or dental school and permission of instructor. Only Spring.

8 credits, Letter graded (A, A-, B+, etc.)

HBY 553: Signal Transduction

The course will emphasize fundamental concepts in signal transduction (e.g. membrane-protein and protein-protein interactions, amplification of signals), and individual lectures will apply these concepts at each stage of cell signalling from the cell surface to the nucleus, where signal transduction leads to specific gene expression. Crosslisted as HBY 553 or HBH 553.

Prerequisites: Admission to Graduate Health Sciences Center Program, Spring odd years, 3 credits, ABCF grading

3 credits, Letter graded (A, A-, B+, etc.)

HBY 554: Principles of Neuroscience

The aim of this course is to highlight and create an understanding as to how the human nervous system operates.

3 credits, Letter graded (A, A-, B+, etc.)

HBY 557: Advanced Physiology

This course is designed to introduce students to integrative approaches in biomedical research. Emphasis will be placed on the primary physiological concepts of control, communication, signal processing, metabolism and replication. Prerequisites: Systems Physiology, Biochemistry and Permission of Instructor.

Spring, 3 credits, Letter graded (A, A-, B+, etc.)

HBY 561: Statistical Analysis of Physiological Data

Statistical methods useful in analyzing common types of physiological data. Topics include probability, data distributions, hypothesis testing with parametric and non-parametric methods, ANOVA, regression and correlation, and power analysis. Emphasis is on experimental design and appropriate, efficient use of statistical software.

Offered

Spring, 1 credit, Letter graded (A, A-, B+, etc.)

HBY 562: Model-based Analysis of Physiological Data

The analysis of common biochemical and physiological data by non-linear regression of data models and biophysical models of physiological and biochemical processes. Examples include binding kinetics, compartmental mass transfer and spectral analysis.

Prerequisite: Permission of instructor, HBY 561

Fall, 1 credit, Letter graded (A, A-, B+, etc.)

HBY 564: Experimental Techniques in Systems Physiology

A series of lectures and laboratory exercises designed to introduce students to in vivo experimental techniques used in systems physiology. Emphasis will be placed on the ethical use of rodents in biomedical research and the measurement of physiological variables. Data acquisition and analysis procedures used in cardiovascular, respiratory, neural, and renal physiology will also be covered. Only

2 credits, Letter graded (A, A-, B+, etc.)

HBY 565: Mathematical Models of Physiological and Biophysical Systems

An introduction to mathematical modeling of cell and tissue function. Topics include the derivation and numerical solution of models of cell homeostasis, membrane transport and excitability, and cell signaling and metabolism. Grading is based on problems, student presentations, and completion of a modeling project. Only Spring.

3 credits, Letter graded (A, A-, B+, etc.)

HBY 570: Student Journal Club

Graduate student presentation on a selected topic with faculty consultation.

1 credit, Letter graded (A, A-, B+, etc.)

May be repeated for credit.

HBY 590: Special Topics in Physiology and Biophysics

Students seminars on topics to be arranged through consultation with faculty members. Prerequisite: Permission of instructor.

Offered

Fall and Spring, 1 credit, S/U grading

May be repeated for credit.

HBY 591: Physiology and Biophysics Research

Original investigation under the supervision of a staff member.

1-12 credits, Letter graded (A, A-, B+, etc.)

May be repeated for credit.

HBY 690: Seminar in Physiology and Biophysics

Seminars and discussions on major topics in physiology and biophysics by students, staff, and visiting scientists. Prerequisite: Permission of instructor

0-1 credits, S/U grading

May be repeated for credit.

HBY 695: Practicum in Teaching in Physiology and Biophysics

Practical experience and instruction in the teaching of physiology and biophysics carried out under faculty orientation and supervision.

1 credit, Letter graded (A, A-, B+, etc.)

May be repeated for credit.

HBY 699: Dissertation Research on Campus

Original (thesis) research undertaken with the supervision of a member of the staff. Prerequisite: Advancement to candidacy (G5); permission of thesis advisor. Major portion of research must take place on SBU campus, at Cold Spring Harbor, or at the Brookhaven National Lab.

1-9 credits, S/U grading

May be repeated for credit.

HBY 800: Full-Time Summer Research

Full-time laboratory research projects supervised by staff members.

S/U grading

May be repeated for credit.