HBH 501: Principles of Pharmacology
Basic principles and mechanism of drug distribution, absorption, metabolism and elimination. Principles of chemical carcinogenesis and tumor promotion. Autonomic, Smooth Muscle and CNS Pharmacology. Pharmacology of specific drugs of historical interest including alcohol, antibiotics, aspirin, nicotine and morphine. Review of anticoagulants & thrombolytic agents, antiparasitic, and drugs for the treatment of allergic conditions and gout. Includes discussion of specific cases taken from clinical practice and a presentation based on a set of selected readings. Crosslisted with BCP 401
Fall, 4 credits, Letter graded (A, A-, B+, etc.)

HBH 502: Advanced Principles of Pharmacology
Spring, 4 credits, Letter graded (A, A-, B+, etc.)

HBH 506: Graduate Pharmacology Colloquium
Research seminars in pharmacology and toxicology presented by faculty and distinguished scientists from academic and industrial institutions. A 1 hr. Journal Club/Discussion Session precedes seminar to review a reference paper relevant to the research concepts to be presented. Students are expected to develop an understanding of the scientific principles given in the colloquium. Students are required to give a formal presentation. Co-scheduled with BCP 406
Offered
Spring, 2 credits, Letter graded (A, A-, B+, etc.)
May be repeated 1 times FOR credit.

HBH 531: Principles of Medical Pharmacology
Basic principles that underlie actions of drugs on physiological processes with particular reference to their therapeutic and toxic actions. For medical and dental students.
5 credits, Letter graded (A, A-, B+, etc.)

HBH 545: Biochemical Laboratory Techniques
Introduces theoretical principles and experimental techniques used in modern biochemical research. Lectures and homework assignments explore topics in basic molecular and cellular techniques. Prerequisites: Admission to Health Sciences Center program. Fall, 1 credit, Letter graded (A, A-, B+, etc.)
May be repeated 2 times FOR credit.

HBH 546: Biochemical Laboratory Techniques
Continuation of HBH545. Lectures and demonstrations present topics in chromatography, mass spectrometry, protein sequencing, sedimentation, electrophoresis, ligand binding, basic pharmacological methods and statistical analysis of data. Includes procedures for the safe handling of toxic chemicals and radioisotopes. Prerequisites: Permission of instructor, admission to graduate Health Sciences Center program. Spring, 1 credit, Letter graded (A, A-, B+, etc.)
May be repeated 2 times FOR credit.

HBH 550: Statistics in Life Sciences
This course covers statistical concepts and issues in the life sciences. Basic algebra is assumed as a prerequisite. Topics covered include: descriptive statistics, foundation of statistical inference, sampling distribution, point estimate and confidence internal, comparison of independent and paired samples, analysis of categorical data, correlation, ANOVA, linear regression, and nonparametric test.
1 credit, S/U grading
May be repeated for credit.

HBH 560: Proposal Preparation in Regulatory Biology
A literature-based course focusing on major research areas in molecular and biochemical pharmacology. The first part of the course will expose students to a series of examples of recent grant proposals. The second part of the course will feature student presentations of their research proposals. Due to the coordination of this course with the Qualifying Exam, registration is limited to Pharmacology graduate students.
Fall and Spring, 2 credits, S/U grading
May be repeated 2 times FOR credit.

HBH 580: Selected Topics in Pharmacology
Student seminars and readings on topics arranged through consultation with staff.
0-1 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

HBH 585: Advanced Structural Biology/Structural Methods in Drug Discovery
This course is designed for students that want to gain theoretical and practical experience in macromolecular structure determination through NMR spectroscopy and/or X-ray crystallography. The course is organized into two modules: NMR spectroscopy and X-ray crystallography. Students may elect to take one or both modules. Emphasis will be placed on practical aspects of structural determination, including sample preparation, data collection and processing. In each of the modules, students will be guided through a complete structural determination project. A final project report per module will be required. Familiarity with Linux is desirable. Students are encouraged to contact instructors prior to enrolling. Crosslisted as BSB580 and HBH585.
Spring, 0-4 credits, S/U grading

HBH 590: Pharmacology Seminars
Advanced research seminars by staff and visiting lecturers.
Prerequisites: Full-time pharmacology graduate status
Fall and Spring, 0-1 credits, S/U grading
May be repeated for credit.

HBH 599: Graduate Research in Pharmacological Sciences
Original research projects under faculty supervision.
Prerequisites: Full-time pharmacology graduate status
Fall, Spring, and Summer, 0-12 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

HBH 601: Practicum in Teaching Pharmacology
Practical experience and instruction in the teaching of pharmacology carried out under faculty orientation and supervision.
Prerequisites: Full-time pharmacology graduate status
Fall and Spring, 0-1 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

HBH 631: Graduate Pharmacology
Basic principles of pharmacology will be discussed including pharmacokinetics and pharmacodynamics in both normal and various disease states. Major problems in human pharmacology will be considered including obesity, diabetes, hypertension and heart failure. Underlying physiology as well as pathophysiologic background will be presented. Drug design and development will be discussed from both scientific and socio-economic perspectives.

Prerequisites: Graduate Biochemistry, Physiology HBY 561 or consent of instructor.

Fall and Spring, 3 credits, Letter graded (A, A-, B+, etc.)
May be repeated 2 times FOR credit.

**HBH 632: Graduate Pharmacology II**
This course introduces second-year graduate students to chemotherapy agents used to combat bacterial and viral infections as well as cancers. The course develops a detailed understanding of the strategies involved in identifying drug targets in these two diverse therapeutic settings. The antibacterial lectures emphasize the problem of drug resistance and the need to develop new agents to combat resistant organisms. The anti-cancer lectures begin with a comprehensive analysis of the molecular basis of cellular transformation leading to neoplastic disease. Lectures on cancer therapy emphasize the contrast between conventional cytotoxic chemotherapy and novel therapeutic approaches guided by recent developments in cancer research. Novel computational biology and structural biology approaches are featured throughout the course. Each student is expected to make two formal journal-club style presentations during the course and to actively participate in group discussion.

0-3 credits, Letter graded (A, A-, B+, etc.)
May be repeated 2 times FOR credit.

**HBH 655: Neuropharmacology**

An advanced course for graduate students interested in developing an understanding of neuropharmacology and research on this topic. Following a general introduction to the nerve cell structure, synaptic and chemical transmission, three themes receptors, receptors as channels, and G-protein-coupled receptors are developed. Recent advances in cell and molecular biology provide the framework for instruction and discussion. This course is offered as both HBH 655 and BNB 655.

Prerequisite: Admission to Graduate Health Sciences Center Program.

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

**HBH 656: Cell Biology**

Introduction to the structural and functional organization of cells and tissues and to the way structure relates to function. Particular emphasis is placed on nuclear and chromosomal structure, signal transduction, protein translocation, the cytoskeleton and the extracellular matrix. The interaction of cellular structures and components and their regulation is stressed as is the organization and interaction of cells in tissues. The course is comparative and includes examples of cells and tissues from vertebrates, invertebrates, plants, and prokaryotic systems. Prerequisite: matriculation in graduate program or permission of instructor.

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

**HBH 699: Dissertation Research in Campus**

Original investigation undertaken as part of the Ph.D. program under supervision of thesis adviser and committee. 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.

Prerequisite: Full-time pharmacology graduate status
Fall, Spring, and Summer, 0-9 credits, S/U grading
May be repeated for credit.

**HBH 700: Dissertation Research off Campus - Domestic**

Prerequisite: Must be advanced to candidacy (G5). Major portion of research will take place off-campus, but in the United States and/or U.S. provinces. Please note, Brookhaven National Labs and the Cold Spring Harbor Lab are considered on-campus. All international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor.

Prerequisite: Full-time pharmacology graduate status
Fall, Spring, and Summer, 0-9 credits, S/U grading
May be repeated for credit.

**HBH 701: Dissertation Research off Campus - International**

Prerequisite: Must be advanced to candidacy (G5). Major portion of research will take place outside of the United States and/or U.S. provinces. Domestic students have the option of the health plan and may also enroll in MEDEX. International students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed. International students who are not in their home country are charged for the mandatory health insurance. If they are to be covered by another insurance plan they must file a waiver be second week of classes. The charge will only be removed if other plan is deemed comparable.

All international students must receive clearance from an International Advisor.
Fall, Spring, 1-9 credits, S/U grading
May be repeated for credit.