

## COURSE INFORMATION

### COURSE DESCRIPTION

Ongoing; Year 1 (3 Rotations - Required)

Title: **Research in Pathobiology**  
Course Number: ME.300.800  
Course Director: Lee Martin, Ph.D.  
Dates & Time: By arrangement with course directors and individual mentors  
AUGUST – MAY (Ongoing, Year 1, 3 Rotations)

Long-term research projects will be undertaken with faculty members of the Graduate Program in Pathobiology serving as mentors. Course also covers the three required rotations for 1<sup>st</sup> Years.

### COURSE DESCRIPTION

All Academic Years, All students (Required)

Title: **Pathobiology Journal Club**  
Course Number: ME.300.803  
Course Directors: Bear Huang, M.D., Ph.D. & Lee J. Martin, Ph.D.  
Dates & Times: SEPT – DEC & JAN – MAY; TUES; 12:30-1:30PM  
Location: Wood Basic Science Auditorium (WBSB/PCTB)

The objective of this course is to train graduate students in the fundamentals and art of understanding and determining the quality and structure of scientific publications. Students will select publications for presentation. The paper selection process will be a joint effort with a faculty member. Papers will be carefully read and scrutinized for detail of experimental background and logic, experimental approach and methods, results, figure composition and presentation, and interpretation. Students, with advice from a faculty mentor, will prepare and present to an audience a PowerPoint presentation (approximately 45 minutes) on the selected paper. The student will anticipate and prepare for questions about the paper as part of the presentation. The course is open to all graduate students and postdoctoral fellows.

### COURSE DESCRIPTION

Year 1, Semester 1 (Required)

Title: **Pathology for Graduate Students: Basic Mechanism of Disease**  
Course Number: ME.300.713  
Course Directors: Christopher VandenBussche, M.D. and Jackie Birkness-Gartman, M.D.  
Dates & Time: SEPT – NOV; M,W,F; 9AM-2:00PM (times vary-refer to schedule)  
Location: PCTB 113 (PCTB)

Pathology for Graduate Students: Basic Mechanisms will concentrate on the basic mechanisms of tissue injury and disease both at the molecular level and as they are manifested in human tissues. Normal tissue histology and function will be discussed in relation to organ systems as a basis for the understanding of disease mechanisms.

A & P histology review lectures will be followed by faculty lectures and case studies. This block on basic pathogenic mechanisms will prepare students for more advanced topics on organ specific diseases that can be taken individually or in succession. The advanced blocks will be organized under 3 themes: 1) Neoplasia, 2) Immunopathology, and 3) Neuropathology.

### COURSE DESCRIPTION

Year 1, Semester 1 (Required)

Title: **Analysis of Macromolecules: Energetics, Structure and Function**  
Course Number: ME.100.716  
Course Director: Dominique Frueh, Ph.D.  
Dates & Time: SEPTEMBER – OCTOBER; M,T,Th,F; 9-10:30AM  
Location: Wood Basic Science Auditorium (WBSB/PCTB)

The course will cover (1) macromolecules, (2) physical chemical principles dictating their biological behavior, and (3) methods to study them. Lectures will focus on practical application of the methods, experimental design, data collection, and elementary aspects of data analysis.

### COURSE DESCRIPTION

Year 1, Semester 1 (Required)

Title: **Intro to Responsible Conduct of Research** (*replaces Ethics I and II*)  
Course Number: ME.800.811  
Course Director: Office of Graduate Biomedical Education  
Time: OCTOBER – NOVEMBER; Mondays, 3-4:30PM  
Location: West Lecture Hall (WBSB/PCTB)

This first-year course incorporates discussion on topics such as: (a) the scientist as a responsible member of society, (b) research misconduct, (c) data acquisition and management, (d) authorship and publication practices, (e) mentor and trainee responsibilities, (f) use of animals in research, (g) conflicts of interest, (h) collaborative research and (i) human subjects protection. By inviting graduate students from a variety of training programs, the course provides a forum for students to share their experiences. Attendance is required for all sessions.

### COURSE DESCRIPTION

Year 1, Semester 1 (Required)

Title: **Molecular Biology and Genomics**  
Course Number: ME.260.709  
Course Directors: Jeffery Collier, Ph.D.  
Dates & Times: OCTOBER – DECEMBER; M,T,Th,F; 9-10:30AM  
Location: Wood Basic Science Auditorium (WBSB/PCTB)

This course module covers the Molecular Biology and Genomics of both prokaryotes (using *E. coli* as the model organism) and eukaryotes, with a focus on "model organisms" including yeast, flies, worms, mice as well as humans. Both the Molecular Biology (reductionist) perspective and the Genomics (systems biology) perspective will be provided on each topic, and there will be heavy emphasis on mechanism and regulation of fundamental processes in biological information transfer DNA->RNA->protein. This lecture module will cover genes and genomes, transcription and RNA world, replication, chromosome structure and function and genome instability.

### COURSE DESCRIPTION

Year 1, Semesters 1 & 2 (Required)

Title: **Principles of Genetics**  
Course Number: ME.110.733  
Course Director: Erika Matunis, Ph.D.  
Dates & Time: DECEMBER – JANUARY; M,T,Th,F; 9-10:30AM  
Location: PCTB 115 & 113

This short lecture course will cover fundamental principles of genetics, focusing primarily on principles of genetics, focusing primarily on model eukaryotes. Problem sets will be an integral learning tool in this course.

### COURSE DESCRIPTION

Year 1, Semester 2 (Required)

Title: **Cell Structure and Dynamics**  
Course Number: ME.110.728  
Course Director: Jian Liu, Ph.D.  
Dates & Time: JANUARY - FEBRUARY; M,T,Th,F; 9-10:30AM  
Location: Wood Basic Science Auditorium (WBSB/PCTB)

The objective of this course is to provide the basics of cell biology, including the structure, function and biogenesis of cellular organelles. Also covered are essential concepts on the cytoskeleton, cell-cell and cell-extracellular matrix interactions, cell motility, chaperones, and protein turnover.

### COURSE DESCRIPTION

Year 1, Semester 2 (Required)

Title: **Pathways and Regulation**  
Course Number: ME.360.728  
Course Directors: Anastasia Kralli, Ph.D. & Zhaozhu Qiu, Ph.D.  
Dates & Time: FEBRUARY – MARCH; M,T,Th,F; 9-10:30AM  
Location: Wood Basic Science Auditorium (WBSB/PCTB)

This course will cover the principles of membrane transport, bioenergetics, metabolic pathways, cell cycle and cell death with particular emphasis on regulatory mechanisms including receptor-mediated signaling, small GTPases, lipid molecules, kinases and phosphatases.

### COURSE DESCRIPTION

Year 1, Semester 2 (Required)

Title: **Pathology for Graduate Students: Cancer**  
Course Number: ME.300.714  
Course Director: Angelo DeMarzo, M.D., Ph.D.  
Dates & Time: FEBRUARY – MARCH; M & F; 11:00AM-2:00PM  
Location: Carnegie 489

Pathology for Graduate Students: Cancer will concentrate on the biology of cancer at the molecular, cellular, and tissue levels. While the course is largely organized to study cancer in the context of specific organs, general principles of neoplasia will be continuously discussed as a basis for understanding the disease process. The format will include lectures, discussion of research papers, and review of histological slides.

### COURSE DESCRIPTION

Year 1, Semester 2 (Required)

Title: **Graduate Immunology**  
Course Number: ME.250.703  
Course Director: Mark Soloski, Ph.D.  
Dates & Time: FEBRUARY – MAY; T & Th; 10:30AM-12:15PM  
Location: PCTB 115

This is an introductory course designed to provide graduate students with a comprehensive survey of modern cellular and molecular immunology. The course consists predominately of lectures but also includes discussion sessions focusing on important recent research papers. This course is open to all graduate students and postdoctoral fellows.

### COURSE DESCRIPTION

Year 1, Semester 2 (Required)

Title: **Pathobiology and Disease Mechanisms**  
Course Number: ME.300.710  
Course Director: Richard Roden, Ph.D.  
Dates & Time: FEB – APR (WED; 9-11:00AM); MAY (W,F; 1-3:30PM)  
Location: Carnegie 489

Pathobiology and Disease Mechanisms provides an intensive study of human disease through traditional lectures, and the discussion of the primary scientific literature including classic and current cutting edge papers. The course combines lectures with small group discussions, and will cover topics relevant to infectious, degenerative, neoplastic, and inflammatory disease of the major organ systems. The primary objective of the course is to understand how research findings elucidate the underlying mechanisms leading to clinical manifestations of disease (seen grossly and microscopically in the traditional Pathology component of the course). Active student participation is required in the form of presenting and discussing papers. The course is open to all PhD and MD/PhD students.

### **COURSE DESCRIPTION**

Year 1, Semester 2 (Required)

Title: **Pathology for Graduate Students: Immunology & Infectious Disease**  
Course Number: ME.300.716  
Course Director: Gyanu Lamichhane, Ph.D.  
Dates & Time: APRIL – MAY; M & F; 9:00AM-12:00PM  
Location: Carnegie 489

Pathology for Graduate Students: Immunology and Infectious Disease will concentrate on the basic mechanisms of Immunology and Infection in human diseases. The format will include lectures, discussion of research papers, and review of histological slides.

### **COURSE DESCRIPTION**

Year 1, Semester 2 (Required)

Title: **Pathology for Graduate Students: Neuropathology**  
Course Number: ME.300.715  
Course Director: Philip Wong, Ph.D.  
Dates & Time: MAY; M,W,F; 9AM-12:00PM  
Location: Carnegie 489

Pathology for Graduate Students: Neuropathology will concentrate on the basic mechanisms of Neuropathology both at the molecular level and in human diseases. Normal tissue histology and function will be discussed as a basis for the understanding of Neuropathology. Animal models of neuropathological diseases will be critically considered.

### **COURSE DESCRIPTION**

Year 2, Semester 2 (Required)

Title: **Grant Writing 101**  
Course Numbers: ME.300.717  
Course Director: Nicholas Roberts, Vet.M.B., Ph.D.  
Dates & Time: MARCH – MAY; M,W,F; 10:00-11:00AM  
Location: TBD

The course will explore how to pick a scientific area. Students will write mini-grants in the format of an NIH F31 pre-doctoral award.

## COURSE DESCRIPTION

Year 3 (Required)

Title: **Introduction to Translational Research I & II**  
Course Numbers: ME.300.711 (I) & ME.300.712 (II)  
Course Director: Aaron W. James, M.D., Ph.D. (*student chooses PI*)  
Dates & Time: Two Sections: One-half quarter each approximately 16 hours, each  
Time & Locations: Assigned by Course Director

Introduction to Translational Research is designed to acquaint pre-doctoral students with the language of anatomic pathology and clinical pathology through practical experiences. Students will rotate through surgical pathology and various laboratory services including chemistry, hematology, the blood bank, medical microbiology, and diagnostic immunology. Students will become acquainted with the resources that can be made available to research, and will appreciate the translational relevance of their research to clinical medicine. Open to students in the Graduate Program in Pathobiology and others with permission of the Program Directors.

## COURSE DESCRIPTION

Year 2 and Beyond (Optional)

Title: **Teaching in Pathobiology**  
Course Numbers: ME.300.802  
Course Director: Lee J. Martin, Ph.D.  
Dates & Time: All quarters  
Time & Locations: Assigned by Course Director

Teaching in Pathobiology is designed to prepare students for teaching through participation as a teaching assistant for Pathobiology required courses. Program approval required. When registering for the course, please indicate the course number for which you will serve as a teaching assistant.

## ELECTIVES:

All students in their second year and beyond are **required** to take a one-semester elective course for credit in each academic year. Courses may be taken for a grade or pass/fail. Students may choose a course offered in the Johns Hopkins Medical Institutions, SPH or on the Homewood Campus subject to approval by the Program Director(s). Please note that Grant Writing 101 is a required second year course and **does not count as an elective**, nor does the optional course, Teaching in Pathobiology (ME.300.802).

**SOM ELECTIVE COURSE SEARCH LINK:** <https://sis.jhu.edu/classes/Default.aspx>

**SPH ELECTIVE COURSE SEARCH LINK:** <https://www.jhsph.edu/courses>