

## 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

Year 1, Semester 1 (Required)

Title: **Pathology for Graduate Students: Basic Mechanism of Disease**  
Course Number: ME.300.713  
Course Director: Kathy Gabrielson, D.V.M., Ph.D. & Tamara Lotan, M.D.  
Dates & Time: AUGUST – SEPTEMBER; MWF; 9AM-1:00PM  
Location: PCTB 113 Classroom

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: **Macromolecular Structure and Analysis**  
Course Number: ME.100.709  
Course Director: Dominique Frueh, Ph.D. & Jie Xiao, Ph.D.  
Dates & Time: AUGUST – OCTOBER; T & Th; 9-10:30AM  
Location: Wood Basic Science Auditorium/PCTB 115

The structure and properties of biological macromolecules will be presented. Experimental and computational methods used to study macromolecular structure including X-ray crystallography, magnetic resonance, spectroscopy, microscopy, and mass spectrometry will also be covered.

### COURSE DESCRIPTION

Year 1-Beyond (Required)

Title: **Pathobiology Journal Club**  
Course Number: ME.300.803  
Course Director: Saraswati Sukumar, Ph.D. & H. Ben Larman, Ph.D.  
Dates & Times: SEPTEMBER – MAY; TUES; 12:30-1:30PM  
Location: PCTB G18-19

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: **Molecular Biology and Genomics**  
Course Number: ME.260.709  
Course Director: Jeffrey L. Corden, Ph.D.  
Dates & Times: SEPTEMBER – NOVEMBER; MWF; 9-10:30AM  
Location: Wood Basic Science Auditorium

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, Semester 1 (Required)

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

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, Semesters 1 & 2 (Required)

Title: **Computational Biology and Bioinformatics**  
Course Number: ME.800.707  
Course Director: Sarah Wheelan, M.D., Ph.D.  
Dates & Time: NOVEMBER – JANUARY; Mon; 9-10:30AM  
Location: PCTB 115 STILE Classroom

This course is a survey of quantitative methods in modern biology and the computational concepts that are developing to analyze large data sets. Topics range from a review of statistics to problems in sequence analysis to the modeling of complex systems. The goal of the course is to familiarize students with the concepts of computational biology rather than to achieve a deep understanding of any one topic.

### **COURSE DESCRIPTION**

Year 1, Semester 2 (Required)

Title: **Cell Structure and Dynamics**  
Course Number: ME.110.728  
Course Director: Rob Jensen, Ph.D. & Hiromi Sesaki, Ph.D.  
Dates & Time: JANUARY - MARCH; MWF; 9-10:30AM  
Location: Wood Basic Science Auditorium/PCTB 115

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 Director: Guang William Wong, Ph.D. & Steve Claypool, Ph.D.  
Dates & Time: JANUARY – FEBRUARY; T & Th; 9-10:30AM  
Location: Wood Basic Science Auditorium/PCTB 115

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: **Graduate Immunology**  
Course Number: ME.250.703  
Course Director: Mark Soloski, Ph.D.  
Dates & Time: FEBRUARY – MAY; T & Th; 10:30AM-12:30PM  
Location: Wood Basic Science Auditorium/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: **Pathology for Graduate Students: Cancer**  
Course Number: ME.300.714  
Course Director: Angelo DeMarzo, M.D., Ph.D.  
Dates & Time: MARCH – APRIL; MWF; 9AM-12:00PM  
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: **Pathobiology and Disease Mechanisms**  
Course Number: ME.300.710  
Course Director: Richard Roden, Ph.D.  
Dates & Time: MARCH – JUNE; W & F; 1-2:30PM  
Location: TBA

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: Petros Karakousis, Ph.D.  
Dates & Time: APRIL – MAY; MWF; 9AM-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; MWF; 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 (Required)

Title: **\*Research Ethics Course – Section I and Section II**  
Course Director: Office of Graduate Student Affairs  
Time: 2 Half Day Sessions - Fall and Spring  
Location: TBA

Recognize the key concepts in the responsible conduct of research, including data acquisition and management, mentor/trainee responsibilities, publication practices and authorship standards, conflicts of interest and commitment, and scientific misconduct.

*\*NOTE: Completion of this course is a SOM requirement for graduation. This course is offered in two parts, Section I in the fall and Section II in the spring.*

### **COURSE DESCRIPTION**

Year 2, Semester 4 (Required)

Title: **Grant Writing 101**  
Course Numbers: ME.300.717  
Course Director: James Eshleman, M.D., Ph.D.  
Dates & Time: MARCH – MAY; MWF; 10:00-11:00AM  
Location: TBA

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 2, Semester 4; Summer 2 (Required)

Title: **Introduction to Translational Research I & II**  
Course Numbers: ME.300.711 (I) & ME.300.712 (II)  
Course Director: Kathy Burns, M.D., Ph.D.  
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: Staff  
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. 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, or on the Homewood Campus subject to approval by the Program Director. 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) count as an elective.

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

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