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 1st 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 Coller, 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)

<table>
<thead>
<tr>
<th>Title:</th>
<th>Principles of Genetics</th>
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<tbody>
<tr>
<td>Course Number:</td>
<td>ME.110.733</td>
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<tr>
<td>Course Director:</td>
<td>Erika Matunis, Ph.D.</td>
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<tr>
<td>Dates &amp; Time:</td>
<td>DECEMBER – JANUARY; M,T,Th,F; 9-10:30AM</td>
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<tr>
<td>Location:</td>
<td>PCTB 115 &amp; 113</td>
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This short lecture course will cover fundamental principles of genetics, focusing primarily on model eukaryotes. Problem sets will be an integral learning tool in this course.

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### COURSE DESCRIPTION
Year 1, Semester 2 (Required)

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

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### COURSE DESCRIPTION
Year 1, Semester 2 (Required)

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

<table>
<thead>
<tr>
<th>Title: Pathology for Graduate Students: Immunology &amp; Infectious Disease</th>
<th>Course Number: ME.300.716</th>
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<tbody>
<tr>
<td>Course Director: Gyanu Lamichhane, Ph.D.</td>
<td>Dates &amp; Time: APRIL – MAY; M &amp; F; 9:00AM-12:00PM</td>
</tr>
<tr>
<td>Location: Carnegie 489</td>
<td>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.</td>
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### COURSE DESCRIPTION

**Year 1, Semester 2 (Required)**

<table>
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<tr>
<th>Title: Pathology for Graduate Students: Neuropathology</th>
<th>Course Number: ME.300.715</th>
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<tr>
<td>Course Director: Philip Wong, Ph.D.</td>
<td>Dates &amp; Time: MAY; M,W,F; 9AM-12:00PM</td>
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<tr>
<td>Location: Carnegie 489</td>
<td>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.</td>
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### COURSE DESCRIPTION

**Year 2, Semester 2 (Required)**

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