

# ME.360 (PHYSIOLOGY)

## Courses

**ME.360.603. Scientific Foundations of Medicine - Cell Physiology. 0 - 0 Credits.**

**ME.360.696. Research Elective in Physiology.**

**ME.360.699. Physiology Elective.**

**ME.360.720. Organ Systems-Physiology. 6 Credits.**

The course provides a basic understanding of the many different aspects of the internal structure and function of the body. It aims to present a comprehensive survey of the complex interrelationships that exist between the structure and function of cells and organs.

**ME.360.728. Pathways and Regulation. 2 Credits.**

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.

**ME.360.733. Graduate Elective in Renal Physiology. 1 Credit.**

The course provides a basic understanding of the many different aspects of the internal structure and function of the Renal System. It aims to present a comprehensive survey of the complex interrelationships that exist between the structure and function of cells and organs.

**ME.360.734. Graduate Elective in Cardiovascular Physiology. 1 Credit.**

By the end of this course, learners will be able to: 1. Describe blood vessel and smooth muscle physiology. 2. Understand the principles of hemodynamics. 3. Describe the integration of venous return, cardiac output and coronary blood flow. 4. Understand the principles of electrocardiology. 5. Evaluate cardiac action potential and excitation-contraction coupling. 6. Understand and discuss a cardiac electrophysiology article.

**ME.360.735. Endocrinology and Reproductive Physiology. 2 Credits.**  
N/A

**ME.360.736. Pulmonary Physiology. 1 Credit.**

Course Objectives: 1. Describe the normal anatomy of the lungs and chest wall and how their relationship affects the mechanics of respiration. 2. Describe the unique features of the pulmonary circulation. 3. Demonstrate the general principles of gas exchange in the lung. 4. Demonstrate an understanding of static and dynamic mechanics. 5. Describe the mechanisms that govern control of ventilation. 6. Contrast normal pulmonary physiology with the changes that occur during pregnancy.

**ME.360.737. Gastrointestinal Physiology. 1 Credit.**

By the end of this course, learners will be able to: 1. Identify and understand the main divisions of the GI tract and their functions. 2. A) Know the overall anatomy and functions of the main sections of the stomach. B) Understand how a H,K exchange ATPase functions to secrete HCl. C) Discuss the endocrine regulation of HCl secretion. 3. A) Know the main segments of the small intestine and be familiar with their absorptive roles. B) Understand the mechanistic basis for absorption of sugars and amino acids. C) Understand the luminal and mucosal phases of lipid digestion and absorption. D) Appreciate regulation of small bowel pH, osmolality and enzyme content. E) Describe the rationale for oral rehydration as a disease therapy. 4. A) Know the basic patterns of muscle contraction in the GI tract and the purposes they serve. B) Explain how the GI tract generates and integrates these contractions. C) Give a guided tour of the GI tract to see how system actually works. 5. Understand and identify Liver anatomy and physiology. 6. A) Know how the microbiome may support health. B) Discuss findings linking changes in the microbiome to disease. C) Provide information on how the microbiome may influence medical therapies in the future. 7. Understand gut-derived peptides and the control of food intake and metabolism.

**ME.360.738. Cellular and Molecular Physiology Teaching Assistant for Organ Physiology Gastrointestinal, Endocrinology, and Reproductive Courses. 1 Credit.**

This course is designed to develop and execute skills as a Teaching Assistant, including integrating educational information relating to complex interrelationships between the structure and function of cells and Gastrointestinal, Endocrinology, and Reproductive Organ Systems. Main components of the course are evaluation methods such as quizzes and exams. You will develop an online quiz that will align with the learning objectives and prepare students for the upcoming exams. You will work closely with students enrolled in the Organ Physiology course. This will entail proctoring exams, grading exams, and reviewing graded exams with students. In this TA elective, you will acquire foundational skills that will facilitate your future development as an educator. This course will be a Pass/Fail, one-credit course.

**ME.360.739. Cellular and Molecular Physiology Teaching Assistant for Organ Physiology Renal, Pulmonary, and Cardiovascular Courses. 1 Credit.**

This course is designed to develop and execute skills as a Teaching Assistant, including integrating educational information relating to complex interrelationships between the structure and function of cells and Renal, Cardiovascular, and Pulmonary Organ Systems. Main components of the course are evaluation methods such as quizzes and exams. You will develop an online quiz that will align with the learning objectives and prepare students for the upcoming exams. You will work closely with students enrolled in the Organ Physiology course. This will entail proctoring exams, grading exams, and reviewing graded exams with students. You will demonstrate your skills in the classroom environment by providing Questions and Answers for the Blood Vessels lecture. In this TA elective, you will acquire foundational skills that will facilitate your future development as an educator. This course will be a Pass/Fail, one-credit course.

**ME.360.800. Physiology Research. 1 - 18 Credits.**  
Lab Research

**ME.360.801. Current Physiology. 1 Credit.**

Students are required to attend all Physiology Department Seminars, which will be posted throughout the department. Also, students are required to attend 12 luncheons with seminar speakers. For six of the seminars, the students will be required to read a relevant paper from the speaker's lab prior to the seminar (a relevant paper can be found by searching the web). After the seminar, students will write and submit a 1 page (12 point, Times New Roman) document describing 1 or 2 "next experiments", which significantly extend or otherwise enhance the findings of a part of the seminar they attended. (Dr. Steven Claypool will review the 1st seminar summary for formatting.) The objective of this exercise is to go beyond understanding the work that was presented by the speaker, and encourage students to think about gaps in knowledge, formulate the next important questions, and design experiments that move a field forward. Grades will be based upon attendance (50%) and the summaries (50%).

**ME.360.802. Research - BCMB. 1 - 18 Credits.**

Laboratory Research