Graduate Medical Physiology I is the first of a two-part course intended to provide a thorough introduction to human systems physiology at the level of first year medical school. The course will provide students with an understanding of the anatomy, function, regulation and integration of human body organ systems, with emphasis on homeostatic maintenance in health as well as in some disease processes. The content of GMPI will cover whole-body fluid homeostasis, cell and membrane physiology, muscle biology (Unit 1), and cardiovascular physiology (Unit 2). This part of the course is primarily lecture based, but also includes problem-solving, group discussion, and online presentations. Unit 3 is a laboratory-based course designed to provide interactive learning activities that contribute to an understanding of the bony features that contribute to the topography of the human skin surface, its clinical landmarks, and the positions of important deeper structures; students work with other members of their dissecting team to examine pertinent bones and their landmarks on a volunteer serving as a surrogate patient.

**Course**
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**Instructors**
Dr. John N Lorenz (Email: lorenzjn@uc.edu); Office hours: By appointment
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Dr. Roger Worrell (Email: Worrelrt@uc.edu); Office hours: By appointment
Dr. Aaron Marshall (Email: marshaaao@ucmail.uc.edu); Office hours: By appointment

**Coordinator**
Emma Jones (Email: jones2ee@ucmail.uc.edu)

**Registration**

<table>
<thead>
<tr>
<th>Course #</th>
<th>Section</th>
<th>Call #</th>
<th>Credits</th>
<th>Class Schedule*</th>
<th>Location</th>
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**Assessment**

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<tr>
<th>Assessment</th>
<th>Class Quizzes (8 pts)</th>
<th>Total=160 pts</th>
<th>Small Group Tests (20 pts)</th>
<th>Exam 1 (44pts)</th>
<th>Exam 2 (48pts)</th>
<th>Anatomy Practical Exams (40 pts)</th>
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<td>12 quizzes/questions; best 8 scores are used</td>
<td>5 tests, Best 4 scores are used</td>
<td>Multiple-choice test covering material from Cellular and Muscle Physiology</td>
<td>Multiple-choice test covering material from Cardiovascular Physiology</td>
<td>Lab-based practical exams. 2 exams, 20 points each.</td>
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| Grading | A 90%–100% | B+ 82%–84.99% | B– 74%–76.99% | C 67%–69.99% | A– 85%–89.99% | B 77%–81.99% | C+ 70%–73.99% | Fail Below 67% |

Also for a passing course grade, the average for the two unit exams must be greater than 67%.

**Prerequisites**
Acceptance into Special Master’s Program in Physiology

**Attendance**
Attendance is required
Auditing  No auditing option

Canvas & Email Policy  Messages sent via Canvas or directly through e-mail will be considered sufficient notice. You should make sure that you have entered your UC email address in Canvas.

Textbooks  Required texts will be provided in electronic format (pdf), or through electronic resources available through the UC library. In addition, the following optional textbooks are recommended for further reading:

- *Medical Physiology: A Systems Approach* (Lange Medical Books) Hershel Raff, Michael Levitzky
- *Medical Physiology.* (ELSEVIER Saunders), Walter F. Boron & Emile L. Boulpaep

Course Content:

Unit 1: Cell Physiology

*Section 1: Membrane potentials:* resting potential, action potential, propagation in nerve and muscle.

*Section 2: Muscle Physiology:* striated muscle, smooth muscle, E-C coupling, metabolism.

*Section 3: Body fluid spaces & water movement, problem solving.*

Unit 2: Cardiovascular Physiology

Cardiac electrophysiology & ECG, cardiac muscle, vascular structure and function, microcirculation, regulation of cardiac output and blood pressure.

Unit 3: Osteology and Surface anatomy

Anatomy of the head, neck and back; anatomy of the thorax & abdomen; anatomy of the upper & lower limbs.