MCB 402 Systems and Integrative Physiology (Spring 2019)

Information and Policies

The aim of this course is to teach advanced undergraduate and graduate students in life sciences the fundamental principles of mammalian physiology. This course will provide a comprehensive understanding of the concepts of how the body works. Major emphasis will be placed on homeostatic control and integration of body systems. Diseases resulting in dysregulation of these systems will be highlighted throughout. The course will cover cellular physiology, the nervous and endocrine systems, muscle physiology, cardiac physiology, respiratory physiology, blood and immune homeostasis, renal physiology, and gastrointestinal physiology and energy homeostasis. In an active learning style, case studies and sample MCAT questions will be used to bring relevance to covered topics. This course is ideal for those interested in medicine, veterinary medicine, nursing, kinesiology, pharmacy, pharmacology or graduate school in the life sciences.

Textbook:
Required Textbook
Physiology (6th Edition) by Costanzo (Elsevier)

Optional Textbook
Principles of Anatomy & Physiology (15th Edition) by Tortora and Derrickson

Lecture Time: 11:00 – 11:50 pm on every Monday, Wednesday, and Friday except for University-designated holidays.

Lecture location: Everitt Lab 2310

- See the HOMEPAGE (https://learn.illinois.edu/course/view.php?id=27108) to obtain a copy of the lecture notes/outlines (under "Course Calendar & Lecture Presentations" link).
- ATTENDANCE of lectures is required. Announcements made in class are considered official.
- In the event of ABSENCE from class, a documented excuse must be presented to obtain credit for clicker questions for that day. The instructor may request verification from the Emergency Dean. More than 3 excused absences will only be allowed at the discretion of the instructor.
- To request DRES ACCOMMODATIONS, please send Dr. Tsai a Letter of Accommodation (LOA) before February 1st.
- Your FINAL GRADE will be in letter grade (with plus/minus). It will be determined by your mean performance as weighted below:
    - Exam 1: 20%
    - Exam 2: 20%
    - Exam 3: 20%
    - Final Exam: 20%
    - iClicker
        - up to 5% for participation throughout the semester
    - Assignment 1: 7.5%
    - Assignment 2: 7.5%
    - Total scoring above 90% or in the top fourth of the class guarantees an A, scoring above 80% or in the top half of the class guarantees a B.
- Exams will occur during class time.
- Exams will not specifically test material covered on previous exams. However, some material requires working knowledge of concepts covered in other sections of the class.
- MAKEUP EXAMS will be given in case of illness or other emergency. A letter from health care practitioner is MANDATORY. The student must contact the course coordinator (Dr. Tsai) within 48 hours of the scheduled exam. No exceptions would be made if the student fails to notify him within this period.
- If there is a CONFLICT with the scheduled final exam, the student must inform Dr. Tsai at least 10 days prior to the exam date.
- **iClicker**: Each student remote has a unique serial number printed on the back. This number is referred to as the clicker ID. You must register your clicker ID in order to receive credit for voting in class (i.e., participation and performance in pop quizzes). To register, go to www.iclicker.com, click on REGISTER and enter your personal information (use your UIN in the Student ID field) and iClicker ID.
- The course coordinator reserves the right to make necessary adjustments to the policies and to grading in order to meet learning objectives.

Instructors

Faculty	Office Phone	Office Address	Email Address
Dr. Erik Nelson	244-5477	523A Burrill Hall	enels@illinois.edu
Dr. Nien-Pei Tsai*	244-5620	423A Burrill Hall	nptsai@illinois.edu

* = course coordinator

Teaching Assistant

Daphne Eagleman (daphnee2@illinois.edu); Office hours: 1-2pm every Tuesday at Burrill Hall 423

Lecture Sequence

Date	Subject	Instructor
January 14-February 1	**Introduction and Neurophysiology** Overview of physiology, central nervous system, autonomic nervous system, sensory systems, cognition and behavior, diseases and aging in neurophysiology	Tsai (8 lectures)
February 4-6	**Introduction to Homeostasis and Endocrinology** Glands, hormones, receptors, signal transduction, feedback loop	Nelson (2 lectures)
February 8	**EXAM-1**	
February 11-15	**Muscle Physiology** Overview of muscle cells and tissues, motor control, skeletal muscle physiology, smooth and cardiac muscle physiology	Tsai (3 lectures)
February 18-27	**Cardiovascular System** Overview of cardiac cycle, vasculature, cardiac electrophysiology, circulation.	Tsai (5 lectures)
March 1-6	**Blood & Immune** Overview of hemostasis, blood types, stem cells & differentiation, immune	Nelson (3 lectures)
March 8	**EXAM-2**	
March 11 -15	**Renal Physiology** Kidney function, homeostatic control of electrolyte balance and blood pressure, acid/base physiology.	Nelson (first 3 of 5 lectures)
March 16-25	**SPRING BREAK**	
March 25–27	**Renal Physiology (continue)** Kidney function, homeostatic control of electrolyte balance and blood pressure, acid/base physiology.	Nelson (last 2 of 5 lectures)
March 29 – April 5	**Respiratory System** Ventilation and perfusion, gas exchange and transport, mechanics of breathing and breathing control.	Tsai (4 lectures)
April 8	**EXAM-3**	
April 10-15	**Bone Physiology** Homeostatic control of bone quality, Ca^{2+}/PO_4^{2-} balance.	Nelson (3 lectures)
April 17-24	**Gastrointestinal Physiology and Energy Homeostasis** Digestive system, metabolic physiology, thermoregulation.	Nelson (4 lectures)
April 26-May 1	**Endocrine Disorders and Dysregulation of Homeostasis** Case studies and diagnoses	Nelson (3 lectures)
May 3-11 (date to be set by registrar)	**FINAL**	