PHYL 5028
Fundamentals of Physiology
Fall 2020

CLASS DAYS and TIME: Thursday 10 – 11:30 AM

CLASSROOM: ALTC 2.219

COURSE DIRECTORS
Dr. Carie Boychuk

OFFICE LOCATION and HOURS: Dr. Boychuk Rm. 3.029V2. By appointment

EMAIL: Dr. Boychuk: Boychukc@uthscsa.edu

TELEPHONE: Dr. Boychuk: 210-450-8449

COURSE FACULTY (Tentative):
Dr. Robert Brenner (Brennerr@uthscsa.edu)
Dr. Carie Boychuk (Boychukc@uthscsa.edu)
Dr. Jeffery Boychuk (Boychuk@uthscsa.edu)
Dr. Teppei Fujikawa (Fujikawa@uthscsa.edu)
Dr. Hye Young Lee (Leeh6@uthscsa.edu)

READ THIS DOCUMENT CAREFULLY –
YOU ARE RESPONSIBLE FOR KNOWING ITS CONTENTS.

COURSE DESCRIPTION AND OBJECTIVES

Fundamentals of Physiology is a 2 credit hour course designed to provide students with a basic understanding of mammalian physiology. Students will be exposed to overarching concepts and contemporary perspectives regarding the normal function (physiology) of the organs and systems of organs of the human body. Lectures will focus on fundamental functions of the cardiovascular, renal, respiratory, gastrointestinal and endocrine systems. This course aims to blend targeted student learning outcomes with critical thinking skills to enhance student understanding of integrative systems biology as an aid to success in the field of biomedical research. Upon successful completion of this course, students will have knowledge of physiological principles of individual organs and systems and a basic appreciation for how interactions between these systems integrate to subserve healthy function.

This course is centered on the principle that doctoral students must take personal responsibility for their own learning. As an upper level course, all lectures will be interactive. Lectures will be built around assigned readings. Therefore, each student will be expected to actively engage with faculty and fellow students during lectures to facilitate and enhance the learning experience.

Pre-requisites – IBMS 5000 or at the discretion of the course directors

Semester credit hours – 2

By the end of this course, each student should be able to describe and discuss:

- Describe and discuss the basic organization of body fluid compartments, the concept of homeostasis and consistency of the internal milieu as applied to the major organs and systems of the body. Students should understand the operational features of negative and positive feedback control systems, feed-forward regulation and mechanisms of disease reflecting limits of functional compensation.
- Describe and discuss normal physiology of the heart and specific components of the vascular system.
- Describe and discuss mechanisms used by the kidneys to maintain water and electrolyte balance and acid-base homeostasis.
- Describe and discuss key features of pulmonary mechanics and alveolar gas exchange and the neural basis of pulmonary ventilation.
- Describe and discuss anatomical and functional features of major divisions of the autonomic nervous system and their pharmacological modulation.
- Describe and discuss mechanisms and regulation of digestion and nutrient absorption along the GI tract.
- Describe and discuss the physiology of major endocrine systems, including hormones that are derived from and which modulate the function of hormones from the pituitary and thyroid glands, GI organs/tissues, the kidneys and the adrenal glands, and their roles in regulating responses to stress, blood sugar variations, appetite, fertility, pregnancy, parturition and growth.

COURSE ORGANIZATION

Teaching modalities used in this course include:

1) Didactic lectures 2) student participation 3) regular quizzes

Materials – Faculty generated learning objectives and related reading material.

Computer Access – Physiology simulations accessible online

Reading Assignments – At the discretion of individual faculty

ATTENDANCE

To achieve the expected level of competency, students must be fully engaged. Attendance at every class session is therefore expected. Final course grades will take into account attendance as well as participation in classroom discussions (see "Grading and Examination Procedures" below).

TEXTBOOKS

Required: As assigned by faculty

Recommended: Medical Physiology by Walter Boron, M.D. Ph.D. and Emile L. Boulpaep, M.D. IBN13: 978-1455743773 * note that a particular edition is not required. However, the 3rd edition is listed here.

GRADING POLICIES AND EXAMINATION PROCEDURES

Each student's final course grade will be based on scores from two (2) examinations (30% each), daily quizzes (20%), attendance and participation (20%). Examinations will be essay and short-answer format and will take place in the classroom during a regularly scheduled class. Take-home exams will NOT be given.

Missed examination policy

Make-up examinations **may** be offered in cases of emergency at the discretion of the course directors. A timely phone call (Dr. Boychuk 210-450-8449) or email to the course directors explaining the nature of the

emergency is required. Failure to comply with the policies as outlined above will result in a score of 0 (zero) for the examination in question. Should a make-up examination be permitted, it must be completed within one week of the original examination date unless otherwise approved. The format of make-up examination is at the discretion of the course directors.

Grading System

The final course grade will be assigned according to the grading system within the Graduate School of Biomedical Science as follows:

A = 90-100% B = 80-89.9% C = 70-79.9% F = < 69.9%

REQUESTS FOR ACCOMODATIONS FOR DISABILITIES

In accordance with policy 4.2.3, **Request for Accommodation Under the ADA and the ADA Amendments Act of 2008 (ADAAA)**, any student requesting accommodation must submit the appropriate request for accommodation under the American with Disabilities Act (ADA, form 100) to his/her appropriate Associate Dean of their School and a copy to the ADA Coordinator. Additional information may be obtained at http://uthscsa.edu/eeo/request.asp.

ACADEMIC INTEGRITY AND PROFESSIONALISM

Any student who commits an act of academic dishonesty is subject to discipline as prescribed by the UT System Rules and Regulations of the Board of Regents. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an exam for another person, signing attendance sheets for another student, and any act designed to give unfair advantage to a student or the attempt to commit such an act. Additional information may be obtained at:
http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/academicdishonestypolicy/

TITLE IX AT THE UNIVERSITY OF TEXAS HEALTH SAN ANTONIO (UTHSA)

Title IX Defined:

Title IX of the Education Amendments of 1972 is a federal law that prohibits sex discrimination in education. It reads "no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving federal financial assistance."

University of Texas Health San Antonio's Commitment:

UTHSA is committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, UTHSA does not discriminate on the basis of sex in its education programs and activities, and it encourages any student, faculty, or staff member who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to immediately report the incident to the Title IX Director.

In an emergency, victims of sexual abuse should call 911. For non-emergencies, they may contact UPD at 210-567-2800. Additional information may be obtained at http://students.uthscsa.edu/titleix/

EMAIL POLICY

Every student is issued a University e-mail address and account at the time of enrollment. As a matter of

University Policy, communications between students and faculty that occur using the student's University e-mail address is considered official business. Therefore, students are expected to check their university email inboxes on a regular basis so that any announcements, instructions, or information regarding this course will be received in a timely way. Missed communications due to inadequate monitoring of incoming emails on the University's email server will never be a valid excuse for unsatisfactory academic progress.

USE OF RECORDING DEVICES

Recording of lectures and other learning activities in this course by any means (e.g., video, audio, etc.) is only permitted if approved by the instructor or required for compliance with Americans with Disabilities Act (ADA).

ELECTRONIC DEVICES

Cell phones must be turned off during all class meetings and exams. Computers and electronic tablets are allowed only for participating in classroom activities (e.g., viewing slides presented in lecture or conference materials). No texting, tweeting, emailing, web-surfing, gaming, or any use of electronic devices that is not directly connected with classroom activities is permitted.

PHYL 5028 Fundamentals of Physiology
CLASS SCHEDULE
Thursday and 10-11:30 AM (1.5 hour lecture, once a week)

July 16, 2020	Foundations of Physiology: The Internal Milieu, Homeostasis, Control Systems, Cells and Molecules	C.Boychuk
July 23, 2020	Muscle Physiology	C.Boychuk
July 30, 2020	The Cardiovascular System: The Heart As a Pump	Brenner
August 6, 2020	The Cardiovascular System: Vascular Hemodynamics	Brenner
August 13, 2020	The Cardiovascular System: Integration and Regulation	Brenner
August 20, 2020	Respiratory Physiology – Pulmonary Anatomy and Mechanics	C. Boychuk
August 27, 2020	Respiratory Physiology – Alveolar Gas Exchange	C. Boychuk
September 3, 2020	Respiratory Physiology – Neural Control Mechanisms	C. Boychuk
September 10, 2020	Exam Review	C. Boychuk/Brenner
September 17, 2020	Exam 1 (in class)	C. Boychuk/ Brenner
September 24, 2020	Renal Physiology – Kidney and Nephron structure	J. Boychuk
October 1, 2020	Renal Physiology – Glomerular Filtration and the Proximal Tubule	J. Boychuk
October 8, 2020	Renal Physiology – Henle's Loop, Counter-Current Exchange & TGF	J. Boychuk
October 15, 2020	GI Physiology – Oral, Esophageal and Gastric Digestion	Lee
October 22, 2020	GI Physiology – Pancreatic and Intestinal Digestion; Voiding	Lee
October 29, 2020	The Endocrine System – Pituitary and Thyroid Hormones	Fujikawa
November 5, 2020	The Endocrine System – Hormonal Control of Metabolism	Fujikawa
November 12, 2020	Pregnancy and Reproduction	Fujikawa
November 19, 2020	Integrative Homeostasis	C. Boychuk

December 3, 2020	**Exam Review**	**J. Boychuk /Lee/Fujikawa/C. Boychuk**
December 10, 2020	**EXAM 2 (in class)**	**J. Boychuk /Lee/Fujikawa/C. Boychuk**