

## ADVANCED HUMAN ANATOMY & PHYSIOLOGY

BIOL 253 Spring 2020

Corey S. Johnson, Ph.D.

**Lecture:** Tuesdays & Thursdays at 12:30pm-1:45pm in Genome Science 200

**Office hours and contact:** Tuesdays & Thursdays 10am-12pm in Wilson Hall 210. No appointment needed. I will also meet anytime outside of those hours if I am able for those who cannot make it during regular office hours. I can be reached most quickly by email: [johnsonc@bio.unc.edu](mailto:johnsonc@bio.unc.edu)

**Requirements:** Co-requisite: BIOL 253L, Prerequisite BIOL 252 & 252L.

**Spring 2020 Course Information:** An in-depth study of physiological mechanisms at the molecular, cellular, and system levels of organization. Students will develop analytical skills, problem solving skills, and an appreciation for the mathematical, physical, and chemical basis for physiological phenomena. Course intended for pre-professional students who require a second semester of anatomy & physiology beyond BIOL 252/252L.

**Required materials:** Vander's Human Physiology by Widmaier 15th edition. ISBN: 9781260231519. Please see Sakai for announcement regarding your options.

**About your Instructor:** I received my Ph.D. in 2006 from UNC School of Medicine where I conducted research on limb development and ethanol teratogenesis, and I was trained as an anatomist and developmental biologist. I am interested in all aspects of vertebrate and human anatomy, development, and physiology. You too? Let's talk! I've been teaching at UNC since 2007.

**Grading policy and other information:** Outside of class, I will make all important information known through the 'announcements' section of Sakai. Grades will be posted to Sakai as soon as they are available after exams. Your grade for this course will be determined by 3 exams and assignments as follows:

**Exams (70%):** Midterm exams 1 & 2 are 20% each, and Exam 3 is 30% of your final grade.

**Assignments (30%):** Assignments will be given periodically with the goal of helping students learn the knowledge and skills required to perform well in this course. There will be 2 types of assignments.

1. Pre-lecture assignments (10%): reading is necessary! You will have questions on Connect that will help you arrive to class with a solid base-knowledge in the day's topic. Scores are graded for completion (not accuracy). Note, wrong answers result in more questions!
2. In-class assignments (10%): includes participation in the classroom response system, Polleverywhere (see Sakai for registration information). Scores are given for accuracy.
3. Quizzes (10%): there will be several low stakes quizzes throughout the semester to give you formal recall practice. Scores will be given for accuracy.

**Alternative grade calculation:** Should the above calculation result in a lower score than your exam calculation, the later will be used for your final grade.

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**Grading scale:**

		93.0-100	A	90.0-92.9	A-
87.0-89.9	B+	83.0-86.9	B	80.0-82.9	B-
77.0-79.9	C+	73.0-76.9	C	70.0-72.9	C-
67.0-69.9	D+	60.0-66.9	D		
		<60	F		

**Honor code:** Students are expected to abide by the UNC honor code at all times. Your participation in all activities, exams, and assignments implies compliance to the letter and intent of the honor code.

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<b>Date</b>	<b>Topic</b>	<b>Reading</b>
Thu Jan 9	Membranes, Diffusion, Mediated Transport, Epithelial Transport	3.2, 4.1, 4.2, 4.5
Tue Jan 14	Membrane Potentials Osmosis, Resting Membrane Potential	Sakai Module 4.3, 6.5, 6.6
Thu Jan 16	Cardiac Electrophysiology I	12.4
Tue Jan 21	Cardiac Electrophysiology II	12.4
Thu Jan 23	Mechanical Events of the Cardiac Cycle	12.5
Tue Jan 28	Control of Cardiac Output	12.6
Thu Jan 30	Arteries, Arterioles, Veins & Venules	12.8, 12.9, 12.11
Tue Feb 4	Capillaries, Lymphatics, Edema	12.10, 12.12
Thu Feb 6	Integration of CV Function/reflexes, Response to Hemorrhage	12.13, 12.15, 12.16
Tue Feb 11	<b>Exam 1</b>	
Thu Feb 13	Factors Affecting Ventilation	13.2
Tue Feb 18	Lung Mechanics, Alveolar Ventilation	13.3, 13.4
Thu Feb 20	Gas Exchange & Transport	13.5
Tue Feb 25	Gas Transport in Blood	13.6-8
Thu Feb 27	Renal Filtration, Secretion, Reabsorption	14.3
Tue Mar 3	Renal Clearance, Micturition, Fluid Balance	14.4-5
Thu Mar 5	Na <sup>+</sup> Handling by the Renal Tubule	14.6
Tue Mar 10	Spring Break	—
Thu Mar 12	Spring Break	—
Tue Mar 17	Hormonal Control of Water and Na <sup>+</sup>	14.7
Thu Mar 19	Concentration of Urine, Regulation of Sodium Balance	14.8-9
Tue Mar 24	Handling and Regulation of K <sup>+</sup> Ca <sup>2+</sup> & PO <sub>4</sub> <sup>-</sup>	14.10-13
Thu Mar 26	<b>Exam 2</b>	
Tue Mar 31	Acid Base Homeostasis	14.16-20
Thu Apr 2	Motility, Secretion, Digestion, & Absorption	15.6
Tue Apr 7	Metabolism: Absorptive & Post-Absorptive States	16.1
Thu Apr 9	Endocrine Regulation of Metabolism	16.2-3
Tue Apr 14	Diabetes Mellitus	
Thu Apr 16	Energy Expenditure and Its Regulation	16.4-7
Tue Apr 21	Synthesis, Control, & Dysfunction of Thyroid Hormone	11.9-12
Thu Apr 23	Cortisol, Stress, & Dysfunction of Cortisol	11.13-16
Fri May 1	<b>12pm-3pm Cumulative Final Exam</b>	