Graduate Physiology – Biomed Sci. 510 | **Spring 2021**

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Meeting Times: Lectures – W, F; 9:00 - 10:30, *Zoom Link:* https://hsc-unm.zoom.us/j/96215248854

COURSE DESCRIPTION:
This is a graduate level course designed to provide a fundamental understanding of the basic physiological functions of the cardiovascular, respiratory, renal and endocrine systems. You should consider each 3-week block a separate mini-course on the featured topic. It is important to note that the style and content of each mini-course will vary and be determined by the instructor for each course. Key information from anatomy, physiology, pathology, pharmacology and clinical medicine is integrated into the classroom sessions. Each mini-course consists of two 90-minute class sessions per week equaling 4-9 "in-class" sessions (these may entail a combination of synchronous and asynchronous sessions) and one "in-class" exam (UNM Learn or Take-Home).

LEARNING OUTCOMES: The primary objective of the graduate physiology course is to ensure that students understand how the body works. After completing this course students should be able to:

1. Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu.
2. State the functions of each organ system of the body, explain the mechanisms by which each functions, and in some cases relate the functions and the anatomy and histology of the organ system.
3. Understand and demonstrate the interrelations of the organ systems to each other.
4. Predict and explain the integrated responses of the organ systems of the body to physiological stresses.

TEXTBOOK:
The course is based primarily on lectures and extensive handout material covering each lecture topic that will be distributed by faculty member. There is no required textbook; however, access to a medical physiology text may be useful. Instructors may reference textbook chapters for supplemental outside reading. Examples of these references include Guyton and Hall's Textbook of Medical Physiology, Berne and Levy's Physiology, Costanzo's Physiology and Boron and Boulpaep's Medical Physiology (see attached resource document). These texts are available as eBooks through the Health Science Center Library.

Mini-Course #1 Cardiovascular Physiology
Tom Resta, Ph.D.; Nikki Jernigan, Ph.D.;Emily Morin, Ph.D.
tresta@salud.unm.edu; Njernigan@salud.unm.edu; eemorin@salud.unm.edu

Week 1	W	1/20	Overview of the Cardiovascular System and Hemodynamics	Resta
	F	1/22	Cardiac Cycle	Resta
Week 2	W	1/27	Autonomic Physiology of the Cardiovascular System	Resta
	F	1/29	Cardiac Muscle Physiology I	Resta

Week 3	W	2/3	Cardiac Muscle Physiology II - **Midpoint exam**	Resta
	F	2/5	Reflex Control of Cardiovascular Function	Resta
Week 4	W	2/10	Cellular Signaling in the Vascular Wall	Morin
	F	2/12	Myogenic Tone and Local Control of Blood Flow	Jernigan
Week 5	W	2/17	Microcirculation	Jernigan
	F	2/19	Hemorrhage - dry lab activity/Review	Resta/Jernigan
Week 6	W	2/24	**End of mini-course cumulative exam**	

Mini-Course #2 Pulmonary Physiology
Ben Walker, Ph.D. bwalker@salud.unm.edu

Week 6	F	2/26	Compliance and Pulmonary Surfactant/Ventilation	Walker
Week 7	W	3/3	Ventilation/Gas transport	Walker
	F	3/5	Gas Transport/Pulmonary Circulation	Walker
Week 8	W	3/10	Pulmonary Circulation/Hypoxemia	Walker
	F	3/12	Control of Ventilation	Walker

3/14 – 3/21 Spring Break

Week 9	W	3/24	Dry lab activity/Review	Walker
	F	3/26	**End of mini-course exam**	Walker

Mini-Course #3 Renal Physiology
Nancy Kanagy, Ph.D. nkanagy@salud.unm.edu

Week 10	W	3/31	Renal Anatomy and Intro to Renal Function	Kanagy
	F	4/2	Hypothalamic-pituitary-adrenal axis	Gonzalez Bosc
Week 11	W	4/7	Renal Hemodynamics	Kanagy
	F	4/9	Glomerular Filtration	Kanagy
Week 12	W	4/14	Renal Reabsorption/Secretion	Kanagy
	F	4/16	Concentrating/Diluting	Kanagy
Week 13	W	4/21	Aldosterone Secreting Tumor Activity/Review	Naik
	F	4/23	**End of mini-course exam**	

Mini-Course #4 Integrative Physiology - Team Based Learning

Laura Gonzalez Bosc, Ph.D. lgonzalezbosc@salud.unm.edu

Week 14	W	4/28	TBL: sympatho-adrenal axis	Gonzalez-Bosc
	F	4/30	TBL: sympatho-adrenal axis	Gonzalez-Bosc
Week 15	W	5/5	TBL: Heart Failure	Gonzalez-Bosc
	F	5/7	TBL: Heart Failure	Gonzalez-Bosc

COURSE REQUIREMENTS AND GRADING:

Examinations: The first three mini-courses will include an assortment of assignments, quizzes, and "in-class" activities. For grading purposes, the relative weight of these activities will be established for each mini-course as determined by the instructor. ***EXAMS TAKEN ELECTRONICALLY WILL OCCUR THROUGH THE UNM LEARN SYSTEM, YOU WILL HAVE 2.5 HOURS TO COMPLETE THE EXAM. YOU MUST START THE EXAM ON TIME (I.E. 9:00AM). THE USE OF CELL PHONES OR INTERNET SEARCHES DURING EXAMS IS PROHIBITED.***

Three of the four mini-courses will incorporate an end-of-course exam that covers material from that mini-course. The fourth mini-course will include an Individual Readiness Assurance Test (iRAT) each Tuesday of the mini-course followed by a Team Readiness Assurance Test (tRAT) [see TBL section below]. The point distribution for the fourth mini-course is as follows; each of the two class period topic areas (4/28 - 4/30 and 5/5 - 5/7) are worth a total of 50 points. iRAT, 15 points; tRAT, 5 points; attending and participating in the second class session, 30 points. In determining the **final** overall grade for the course as a whole, the mini-courses will be weighted as follows: Mini-course #1, 30%; Mini-course #2, 25%; Mini-course #3, 25%; Mini-course #4, 20%.

Final grades will be determined as follows:

90-100…….. A
80-89…….. B
70-79…….. C
<70……..F

Team Based Learning (TBL) in the fourth mini-course:

What is TBL? You can read more about it in this webpage **http://learntbl.ca/what-is-tbl/**

During the first topic sessions (Wednesday [4/28 and 5/5] of Mini-course #4), you will take the Individual Readiness Assurance Test (iRAT). Immediately after, you will be assigned to your team, and as a group you will participate in an immediate feedback assessment technique by taking the same test again [Team Readiness Assurance Process Test (tRAT)] using Blackboard Learn. We will go through an appeals process, in which the teams will appeal questions they got incorrect by providing a rationale and defending their answers. If there are concepts requiring clarification, the instructor will give a mini-lecture clarifying those concepts to the entire class.

During the second session (Friday), teams will be given significant problems to solve and will report their solutions to the other teams.

The **objective** of the forth mini-course is to integrate and apply the physiological concepts you have learned in the previous mini-courses. For grading purposes, points are given for the entire activity (See Examinations).

Accommodation Statement

Accessibility Services (Mesa Vista Hall 2021, 277-3506) provides academic support to students who have disabilities. If you think you need alternative accessible formats for undertaking and completing coursework, you should contact this service right away to assure your needs are met in a timely manner. If you need local assistance in contacting Accessibility Services, see the Bachelor and Graduate Programs office.

Title IX Statement

A Note About Sexual Violence and Sexual Misconduct: As a UNM faculty member, I am required to inform the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu) of any report I receive of gender discrimination which includes sexual harassment, sexual misconduct, and/or sexual violence. You can read the full campus policy regarding sexual misconduct at
https://policy.unm.edu/university-policies/2000/2740.html.
If you have experienced sexual violence or sexual misconduct, please ask a faculty or staff member for help or contact the LoboRESPECT Advocacy Center.

Academic Integrity

The University of New Mexico believes that academic honesty is a foundational principle for personal and academic development. All University policies regarding academic honesty apply to this course. Academic dishonesty includes, but is not limited to, cheating or copying, plagiarism (claiming credit for the words or works of another from any type of source such as print, Internet or electronic database, or failing to cite the source), fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. The University's full statement on academic honesty and the consequences for failure to comply is available in the University Catalog and in the Pathfinder.

Cell Phones and Technology

As a matter of courtesy, please turn off cell phones, pagers, and other communication and entertainment devices prior to the beginning of class. Notify me in advance if you are monitoring an emergency, for which cell phone ringers should be switched to vibrate.