

BMSC 8212 –Systems Physiology

Course information:

Course: BMSC 8212 – Systems Physiology

Semester: Fall 2020

Meeting time: Mon-Tues-Wed, 8:30-10:00am

Location: Blackboard Collaborate

Course director information:

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Course description:

Overview of the physiological bases of organ systems. This course identifies key concepts and hypotheses in mammalian organ systems essential for pursuing contemporary experimental studies. The course will include a critical review of current data and interpretations of physiological approaches. The course will be taught as a combination of pre-recorded lectures, in class review sessions, online discussions/small group work, and weekly discussions of primary literature.

Course prerequisites: BMSC 8210

Learning outcomes:

1. Describe the basic principles that govern the function of major body organs and tissue systems.
2. Research skill development, including critical analysis and interpretation of primary literature.
3. Research communication skills development, including the ability to speak effectively about basic science research.

Recommended textbooks and materials:

While no textbook is required, students may rely upon *Textbook of Medical Physiology 13th Ed.* [Guyton & Hall] → free thru Himmelfarb e-books (see “Electronic Reserves” link in Blackboard). The course also utilizes primary literature provided to students in Blackboard.

Workload:

This 3-credit class is run in a shared semester block with BMSC 8210. The course meets three days a week in the second “block” of the semester. The course is comprised of a combination of synchronous and asynchronous learning. One day a week is provided for independent out of class asynchronous learning followed by two days per week in “live” Blackboard Collaborate sessions. Links for each “live” session will be posted on Blackboard under the “Virtual Sessions” tab. Pre-recorded lectures will be posted on Blackboard and students must view these lectures prior to in class sessions (see schedule below). Lecture material will be reviewed in class in the form of question/answer and review sessions. A set of “assessment questions” will be completed after each physiological topic and comprises the bulk of the grade. The remainder of class time will be spent discussing primary literature, as well as developing scientific presentation and communication skills. Time spent reviewing lecture material and completing out of class assessments are expected to take up to, on average, 9 hours per week.

Course policies:

Nobody signed up for online learning of physiology during COVID-19. While we hope that all of you come out of this with scientific eagerness and an interest in physiology, our focus is prioritizing each other as humans, clear communication, and intellectual inquisition. We’ll have to adapt as we go and in doing so – learn. This course relies heavily upon the engagement of everyone. Of course, in an online environment, this can be difficult due to the nature of virtual learning. For the sake of all, the following are required:

- Treat each and every individual with respect and professionalism. In short, be a good human and use appropriate “Netiquette.”

- The course relies heavily on engagement from everyone. In line with this, assignments are due on the dates listed in the schedule below. We recognize that situations arise and in the event of illness and/or emergencies, please let us know as soon as possible in order to accommodate accordingly.
- An “honor code” will be asked of you at certain times (and is expected of course at all times). Faculty may instruct you to answer questions alone and/or in small groups without the use of lecture material, online aids, or books. We will not enforce law and order and lock down your computers. Instead we ask that you follow the instructions given.
- Your webcam must remain on during live sessions unless the instructor tells you to turn them off. We don’t care if you are in your pajamas, if your pet wanders in, or if you haven’t showered in 3 days – none of that gets in the way of physiology.

Assignments:

Assignment	Description	Total
Pre-recorded Lecture Questions	Each pre-recorded lecture incorporates a number of questions to enhance learning. These questions must be answered to obtain this portion of the grade <i>prior</i> to the in class session on the lecture topic. This will serve as 5% of the total grade.	5
“Live” Lecture Session Question	Each lecture session will include a series of questions that will be answered in small groups. The group will provide an answer as a whole and the group answer will serve as the grade. This will collectively comprise 5% of the total grade.	5
Review Questions	A set of essay questions will be provided following each “in-class review” lecture session. These questions must be submitted on Blackboard by the date indicated in the syllabus below and collectively comprise 60% of the total grade.	60
Paper Presentation	Students will be assigned research papers for class presentation and discussion. Students will focus on identifying strengths and weaknesses, understanding contemporary experimental approaches and data analysis, as well as the broader significance of the findings. This will be presented in a 30 minute Microsoft Office 365 Powerpoint and/or Google Slides presentation to the class, which will also include additional time for discussion/questions. This assignment will generate 20% of the final grade. <i>Please see posted instructions for presenting on Microsoft Office 365 (including necessary closed captioning) on Blackboard under the Syllabus tab.</i>	20
Class Participation	Students are expected to actively and critically engage in discussion of lecture material and paper presentations. Feedback from your peers based on small group work will also be incorporated into this portion of the grade. Class participation will comprise 10% of the final grade.	10

Schedule:

Sessions	Topic(s)	Instructor
Oct 19 Mon	Homeostasis, body fluid compartments, control systems	C. Young
Oct 20 Tues	Becoming a science critic *Required readings to be posted on Blackboard	C. Young

Oct 21 Wed	Scientific presentations 101 *Required readings to be posted on Blackboard	C. Young
Oct 26 Mon	<i>Independent study</i> (Lecture videos on Blackboard) Immune System Membrane potential, action potential, and synaptic transmission	
Oct 27 Tues	<i>Review</i> : Immune System (8:30-9:10) <i>Review</i> : Membrane potential, action potential, and synaptic transmission (9:20-10:00) *Assessment questions due Monday November 2 nd by 8:30 am	K. Chiappinelli V. Chiappinelli
Oct 28 Wed	Student paper presentations	
Nov 2 Mon	<i>Independent study</i> (Lecture videos on Blackboard) Smooth and skeletal muscle Endocrine Heart: Cardiac cycle, mechanics and output	
Nov 3 Tues	<i>Review</i> : Smooth and skeletal muscle (8:30-9:10) <i>Review</i> : Endocrine (9:15-9:30) <i>Review</i> : Heart: Cardiac cycle, mechanics and output (9:30-10:00) *Assessment questions due Monday November 9 th by 8:30 am	P. Marvar C. Young C. Young
Nov 4 Wed	Student paper presentations	
Nov 9 Mon	<i>Independent study</i> (Lecture videos on Blackboard) Hemodynamics ECG and autonomics	
Nov 10 Tues	<i>Review</i> : Hemodynamics (8:30-9:10) <i>Review</i> : ECG and autonomics (9:20-10:00) *Assessment questions due Monday November 16 th by 8:30 am	C. Young D. Mendelowitz
Nov 11 Wed	Student paper presentations	
Nov 16 Mon	<i>Independent study</i> (Lecture videos on Blackboard) Hypothalamic, pituitary, adrenal axis Renal	
Nov 17 Tues	<i>Review</i> : Hypothalamic, pituitary, adrenal axis (8:30-9:10) <i>Review</i> : Renal (9:20-10:00) *Assessment questions due Monday November 23 rd by 8:30 am	J.K. Jeong N. Shworak
Nov 18 Wed	Student paper presentations	
Nov 23 Mon	<i>Independent study</i> (Lecture videos on Blackboard) Pulmonary Sensory systems	
Nov 24 Tues	<i>Review</i> : Pulmonary (8:30-9:10) <i>Review</i> : Sensory systems (9:20-10:00) *Assessment questions due Monday November 30 th by 8:30 am	S. Ceryak H. Lui
Nov 25 Wed	Closed for Thanksgiving	
Nov 30 Mon	Student paper presentations	
Dec 1 Tues	**Bone (<i>Independent study</i> - Lecture videos on Blackboard – to be completed prior to this session) *Assessment questions due Monday December 7 th by 8:30 am	U. Kim
Dec 2 Wed	Integrative physiology	C. Young
Dec 7 Mon	Physiology and science policy	C.G. Young

University Policies

Observance of religious holidays

In accordance with University policy, students should notify faculty at the beginning of the course of their intention to be absent from class on their day(s) of religious observance. For details and policy, see: students.gwu.edu/accommodations-religious-holidays.

Academic integrity code

Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information. For details and complete code, see: studentconduct.gwu.edu/code-academic-integrity

Safety and security (this does not apply for COVID, but good recommendations to heed)

In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.

Support for Students Outside the Classroom

Disability Support Services (DSS)

Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in Rome Hall, Suite 102, to establish eligibility and to coordinate reasonable accommodations. For additional information see: disabilitysupport.gwu.edu/

Mental Health Services – 202-994-5300

The University's Mental Health Services offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include: crisis and emergency mental health consultations confidential assessment, counseling services (individual and small group), and referrals. For additional information see: counselingcenter.gwu.edu/