

Biology 3200 – Principles of Physiology

Winter 2019, 3 Credits

Instructor: Dr. Karen Myhr

Office: 2113 Biological Sciences Building.

Office Hours: Dr. Myhr's office hours will be Mondays 2 to 3 pm (Room 2113 Biological Sciences Building), and Thursdays 2 to 4 pm (STEM Commons). If you cannot make office hours, I hope to be able to see you by appointment to be arranged by email at least 24 hours in advance.

In addition, your TA, Kendall Case, will have office hours from 4 to 5 pm on Wednesdays (Rm 131 State Hall), 10 to 11 am on Thursdays (Rm 137 State Hall) and 1 to 2 pm on Fridays (Rm 137 State Hall).

E-mail: kmyhr@wayne.edu (preferred)

Office Phone: 313-577-1504 (often goes to email via voicemail)

Lectures: 4 to 5:15 pm on Tuesdays and Thursdays, Room 100 General Lectures

Textbook (required): *Human Physiology: An Integrated Approach*, Eighth Edition by Dee Unglaub Silverthorn. **ISBN-10:** 0134605195, **ISBN-13:** 978-0134605197

Objectives: You will describe and analyze the structure and function of each body organ and system and the interaction among systems under normal conditions. You will organize processes logically based on cause and effect, compare and contrast similar processes, and identify common exceptions.

You will describe and analyze the integration of physical and chemical processes in physiology. You will explore integration across both levels of organization from molecules to organ systems (e.g. integrating membrane potentials and ion flow into a description of neuronal and whole-body function), as well as across organ systems (e.g. how the renal, cardiovascular, and endocrine systems maintain blood osmolarity and pressure). Practicing integrating (de-compartmentalizing) knowledge is an important part of a deep understanding of physiology and your future professional activity.

Physiology is primarily about regulation, thus you will describe how, when and where physiological processes are regulated. As the semester progresses, this integration becomes more and more evident.

You will be expected to recall numerous specific and detailed facts about each tissue and organ system. This means recognizing and using lots of vocabulary - specific molecules, cell types, and specific core physiology processes and/or concepts of homeostasis. Effective use of this new language is critical to your ability to communicate in class and in your future endeavors.

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- Teams:** Everyone will be on a team for this course. You will discuss the material you are learning in class with your team because this is an excellent way to learn new material, and to identify what you need to study more of before the exams. You will have the choice of joining a team that sits together in class, or one that sits together in class and also meets for a study session for an hour outside of class. Trained honors students will lead the teams that meet for extra study time. These students will lead your team, but you are responsible for coming to every meeting prepared and participating in the activities they lead under my guidance. I strongly recommend that you join a team that meets for an extra hour, especially if you have limited study time. Teams are free!
- Homework & Quizzes:** There will be homework to help you prepare for each lecture, and quizzes to prepare for exams. These will both be free on Canvas. Homework will be due before every lecture. Quizzes will be due after we complete the material for that quiz. You may do each homework assignment and take each quiz as many times as you want to before the deadlines. They are open book, open note, open neighbor and you can help each other on the Canvas Discussions board. Your best score before the deadline will count towards your grade.
- There will be at least 23 lecture preparation homework opportunities worth two points each. You will be able to earn up to 40 points maximum for homework. Similarly, you will be able to earn up to 40 points maximum for quizzes, on at least 22 quizzes (two points each). The reason for the extra opportunities to earn points is to accommodate technical or personal reasons you may miss an occasional homework or quiz, or points on a homework assignment or quiz. You do not need to tell me about technical or personal reasons you may miss points on an occasional homework or quiz. I assume you had a good reason. These occasional problems are taken into account by having more opportunities to earn points than the maximum. Please do let me know about chronic or systematic problems as soon as possible.
- I highly recommend using your textbook to prepare for lectures, and as a reference to clarify material after lectures as part of the study cycle. Exams will focus on what is covered in lecture, not details from the textbook, unless specific assignments are made in class to do on your own.
- Clickers:** We will be using clickers in class this semester because they help you learn, work as a team, make class more fun, and help you practice for exams. You need to have an iClicker2 and use it in class starting the first day. It is a remote control device that allows me to collect answers and see how everyone is doing, so I can cover material a different way if there is a problem.

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You will earn one point for each day you answer most of the clicker questions, up to 20 points for the semester. You do not need to answer correctly to earn credit, because the purpose is to get feedback on what you need to study more. There will be 23 opportunities to earn clicker points during lecture, starting on the first day of class, and not including exam days. Dropping the three lowest days of clicker points is to accommodate occasional problems such as missing class or not having a functioning clicker. It also covers personal reasons to miss class like religious observances, illness and funerals. Please let me know if you have a chronic clicker problem or if there is a systematic problem, but I will assume you had a good reason to not click in if it is an individual, one-time problem. You do not need to tell me why you missed clicking in occasionally.

Exams: There will be three unit exams, each worth 250 points, and a cumulative final exam. Your grade will be based on your two best unit exam grades. Your lowest unit exam score will be dropped. Missed exams will be scored as zero, but one zero may be the dropped unit exam grade. The final exam cannot be dropped. The final exam will be cumulative and will be 400 points. There will not be any alternate make-up exams other than for University-sanctioned obligations, such as WSU team athletic competitions. For final exam policies search for "WSU, Wayne, final exam schedule" (this search should work if the address changes). See Canvas for tips on preparing for exams and details of exam procedures. Knowing how the exam will go can help reduce any anxiety and improve your grades.

Grades:	Exam 1	(2/7/19, in class)	250 points
	Exam 2	(3/7/19, in class)	250
	Exam 3	(4/18/19, in class)	250
	Drop Lowest Unit Exam		-250
	Final Exam	(4/30/19, 2:45-4:45 pm)	400
	Homework		40
	Quizzes		40
	<u>Clicker Points</u>		<u>20</u>
	Total		1000 points total

Grading Policy: Grades will be calculated on the following scale (out of 660 points):

	A	92.5-100%	A-	90.0-92.4%	
B+	87.5-89.9%	B	82.5-87.4%	B-	80.0-82.4%
C+	77.5-79.9%	C	72.5-77.9	C-	70.0-72.4%
D+	67.5-69.9%	D	62.5-67.4%	D-	60.0-62.4%
		F	0-59.9%		

I do not curve the grades. Everyone can earn an A, if they perform well. I do not offer extra credit because it detracts from meeting the learning objectives of the course.

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The lectures will be captured and posted in Echo360 Recordings in Canvas. The purpose is for you to be able to look up a piece of information that you missed. You should still come to class, and you should still take notes and learn the material as we go along. Few students have the time to sit through a lecture twice. If you come to class planning to just listen to the lecture again later, you will not be learning efficiently. If you do not come to class, you will not have the interactions with your team to reinforce the material, and you will not learn it as well. If you are going back to a specific part of the recording to find the answer to a specific question, then you are using your time well. Develop a strategy to take notes indicating just those parts you will need to review.

Sometimes there are technical problems with the EchoCenter. I do not control this, nor can I fix it. If there is a problem with EchoCenter, please contact the C&IT Help Desk at 313-577-4778, heldesk@wayne.edu, or csthlp@wayne.edu. You are welcome to make your own recordings of lecture for your personal use.

General Policies:

1) In fairness to the vast majority of the class who does not cheat, and to maintain the value of your grades, anyone caught cheating will receive a failing grade for the exam or class, and may be expelled from the University.

You may only use your own clicker in class. **If you are caught with someone else's clicker in class, or someone else has your clicker in class you will both earn a zero for ALL of the clicker points for that unit or the whole semester, whether or not you used the clicker.** The only exception is if both students are sitting next to each other in the lecture hall (not in the lobby or bathroom) and one person is just holding both clickers due to the small tables.

For homework and quizzes for this class, you may work with other people and look up answers while you are working. The point of the homework and quizzes is to learn the material, so use these activities to help you reach that goal. Knowing to get help during the learning phase is a sign of a good student, so this is not cheating. It is cheating to get or give help on evaluations, such as in-class exams. If you are not sure when you are allowed to get help in this or another class, please ask for clarification. For discussions of cheating see the "Student Code of Conduct," which can be found at doso.wayne.edu/assets/codeofconduct.pdf

2) On exams, I want to give you credit for answers that are correct given reasonable assumptions, even if it is not the answer I expected. If you would like an alternative answer considered, post your reasoning in the Exam topic in the Discussions board in Canvas. I will consider all posts, but I do not give credit for reasoning along the lines of "the question confused me," or "the question was similar to a quiz question that had a different answer." As you practice with the quizzes you will notice that there are many similar questions with different answers. One point of the quizzes is to help you notice and learn the details that have tripped students up in the past, so you do not make those mistakes on the exams and in the future.

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3) Students who have accommodations for disabilities on file with Student Disability Services must bring their paperwork to me during office hours (or at a time arranged by email, if you have classes during office hours). There is no retroactive accommodation to before I know of the issue. You need to register documented disabilities with Student Disability Services for coordination of your academic accommodations. They need a week or more to arrange accommodations, so make an appointment early. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TTY: telecommunication device for the deaf; phone for hearing impaired students only).

Once you have your SDS accommodations in place, I will be glad to meet with you privately **during my office hours** to discuss your special needs. **You need bring your paperwork to office hours so I can process it and give you the answer sheets if you will need alternate testing.** Please refer to the SDS website for further information about students with disabilities and the services we provide for faculty and students: studentdisability.wayne.edu/ **If your disability requires you to sit in a certain part of the classroom, please sign up for a team that meets your needs. If you have any concern about seating in the lecture hall, for example you have a disability that requires you to sit at the tables in the back, please email kmyhr@wayne.edu as soon as possible so we can make arrangements.**

4) Missing Class. Students are expected to attend every class and lab in person. If you are going to miss class, please see the grading policies above. I do NOT give individual extensions or exceptions on assignments for personal reasons, including but not limited to hospitalization, illness, travel, weddings, transportation problems, weather, funerals, dependent care or family obligations. The general course policies systematically take into account that sometimes students will need to miss one or two classes.

There are exceptions for Student Disability accommodations, and civic duties. If you have a disability please see general policy 3 above. If you have jury duty, a mandatory court date that must be during class, military obligation, religious obligations with inflexible dates during lecture, please email kmyhr@wayne.edu by January 18, 2019 or as soon as possible as the situation arises. In your email include what the conflict is, the date(s), and whether or not you will miss any exams; and attach a pdf or picture of your documentation. You may redact personal information. You may also come to talk to me during office hours. I will do my best to come to a reasonable accommodation that is fair to you and the other students in the course.

5) Electronic Devices and Professional Behavior. Professional behavior is expected, which includes respecting your classmates by arriving on time, not having distractions on electronic devices and not talking. All students must show respect in language and attitude towards the instructors and their fellow students. You are encouraged to discuss differences of opinion with each other, respectfully. Disrespectful students will be asked to move seats or leave, and may lose their opportunity to turn in any missed assignments or earn any points for the day. Children may not attend class. They are adorable, but distracting.

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During lecture, electronic devices may ONLY be used for the purposes of the class, such as taking notes. Electronic devices in class can be useful tools, but too often they are distractions to you and those around you. The consequences for misusing an electronic device in class will be that we will require you to put away your electronics, or we will take your device to return at the end of class. **You will lose your participation (clicker) points for the day, unit, or semester.**

6) If you need to see Dr. Myhr and cannot come during office hours, you are welcome to set up an appointment by email. In order to schedule these appointments, you need to email kmyhr@wayne.edu at least one business day in advance. Please include three unique times that you can meet me. I cannot guarantee I will be available, but I try to meet the needs of my students.

7) **Email guidelines:** I will not reply to emails when the answer can be found in the syllabus or on Canvas. Please post problems or questions of general interest, such as those on course policies, biology content, homework, quizzes or exams, in the Discussions board in Canvas. I am happy to discuss longer biology content questions during office hours. Longer questions that require discussions do not work well by email. Email is best only for quick questions that do not belong on the Discussions board because they are personal.

I will respond to most emails within **two business days**. After two business days, you may email me again. **Due to privacy laws and for professionalism you must email me from your WSU email account of Canvas.** I expect emails to be in a professional style, with your course number and a description of the issue (not your name) as the subject, a proper greeting, e.g. "Dear Professor Myhr," a proper salutation, e.g. "Sincerely, Chris Smith," correct punctuation including capitalization and no texting abbreviations. Emails that do not follow these rules may go into spam, take longer get a reply, may be returned for correction, or ignored. If I cannot figure out what you want, I cannot help you. Following these email guidelines even outside of this course will enhance your success at WSU and beyond.

8) Letters of recommendation are to give people an idea of who you are beyond the grades and classes on your transcript. I do not write letters for students who I only know from my classes. You are likely to need letters from professors. Start planning now how you will get involved on campus so you will have professors who know you well enough to write a letter for you. Examples of how you can get involved include doing research with a professor (urop.wayne.edu), joining a learning community as a member or peer mentor (wayne.edu/learning-communities/), joining a student organization (doso.wayne.edu/org-services), or becoming a supplemental instructor (success.wayne.edu/pal/si).

9) **Withdrawals:** January 18, 2019 is the last day you can drop the class and get your tuition refunded. The last day to drop this course is March 24, 2019. If you withdraw between January 19 and March 24, 2019, inclusive, you will receive a WN on your transcript if you never completed any assignment; a WP if you have greater than 60% of the points possible at the time of your request on exams, quizzes, homework and class participation; or a WF if you have less than 60% of the points possible at the time of your request. No exams or other grades are dropped in this

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calculation. In Academica: select "Course Withdrawal" from the Registration Menu under Student Resources. A ***SMART Check*** is required. After the registrar processes your request they send it to Dr. Myhr to assign a grade. This can take up to five business days. For the academic and registration calendar, see wayne.edu/registrar/registration/calendar18-19/

10) University closures will be publicized through:

- the university emergency broadcast system (broadcast.wayne.edu),
- WSU Homepage (www.wayne.edu),
- the University Newsline (313) 577-5345,
- WDET-FM (Public Radio 101.9)

If the university is closed, the closure includes lecture, any team meetings, and office hours. If a unit exam is scheduled on a day when the University or lecture room is officially closed during class, the exam will be held during the next scheduled meeting of lecture that occurs when the University and room are open, or as indicated on our Canvas site. I will give you instructions through Canvas or WSU email (or possibly Academica if things are going particularly badly) as soon as possible if there is a closure or emergency.

11) For any and all issues not covered in this syllabus, refer to the "Student Code of Conduct," which can be found at doso.wayne.edu/assets/codeofconduct.pdf

12) Updates to this syllabus and schedule may be posted on the course Canvas website at canvas.wayne.edu. You are responsible for checking Canvas announcements and your University email account. I recommend checking at least once each business day of a semester in which you are enrolled.

Course Detailed Learning Objectives. Chapters 2 through 5 were covered in your prerequisite courses. You will have a quiz early in the semester so you can check if you need to review any of the material in these chapters.

We will cover the rest of the book focusing on several overriding questions for each chapter, as described below.

At the end of the course you should be able to

- Describe how the human body maintains a constant internal environment despite large changes in the external environment through communication, **homeostasis** and feedback.
- Describe the organs and signaling molecules of the **endocrine system**, and how the plasma concentrations of hormones for reproduction, metabolism and ion and water balance are regulated. Include the organs of the endocrine system, types of hormones, reflex pathways, feedback control and pathologies.
- Describe the fundamental properties of **brain cells**, neuronal signaling, synaptic communication and signal coding

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- Describe the organization, regions, protection, complex processing and pathology of the **central nervous system**.
- Describe the general principles and some examples of how **sensory information** about the environment gets to and is processed by the brain.
- Describe how the **output of the central and peripheral nervous systems** are organized into autonomic (parasympathetic, sympathetic) and somatic functions.
- Describe how **skeletal muscles** generate and regulate force; and compare skeletal, smooth and cardiac muscle function.
- Describe how movement and posture is controlled by **reflexes** and more complex pathways, including the spindle reflex, the knee jerk reflex and the crossed extensor reflex.
- Describe the organization of the **cardiovascular system**, the cellular function of cardiac contractile and autorhythmic cells, the heart cycle and cardiac output.
- Describe how **blood flows** through the body, how flow velocity affects capillary exchange, how the lymphatic system integrates with fluid flow, and how **blood pressure** is regulated.
- Describe the components of the **blood**, hemostasis and blood types.
- Describe the mechanics of **breathing** and the distribution of gasses via exchange in the lungs and tissues, transport in the blood and the regulation of ventilation.
- Describe how the **kidneys and renal system** remove waste products from the blood by filtration, reabsorption, secretion and excretion; how they regulate blood pressure and ion balance via countercurrent exchange and hormone regulation (vasopressin, aldosterone, the renin angiotensin pathway and the natriuretic peptides); and how they balance body pH.
- Describe how the **digestive system** selectively absorbs nutrients from what we eat, and how the system is regulated. Describe the anatomy motility and secretion of the digestive system. Describe the cephalic, gastric and intestinal phases of digestion and absorption. Describe the immune function of the digestive system.
- Describe how energy is stored and released by **metabolic control**, and analyze what happens when there are complications like diabetes.
- Describe how the **endocrine system** affects body shape and size through cortisol, thyroid hormones, growth hormone and calcium metabolism.
- Describe how the **immune system** prevents infection by pathogens, and analyze the causes and consequences of inappropriate immune responses.
- (Depending on time) Describe how the body responds to normal homeostatic imbalance caused by **exercise**, including synthesizing and analyzing the integration of metabolic, respiratory and cardiovascular responses.
- Describe how the anatomy, function and endocrine regulation of the male and female **reproductive systems** enable fertilization, pregnancy and birth of the next generation.