Bio 4023: Advanced Human Physiology
3 units
Bio 4023L: Advanced Human Physiology lab
1 unit
Point Loma Nazarene University
Fall 2019

instructor:	Dr. Rebecca J. Flietstra
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lecture time/location:	MWF: 8:30—9:25 a.m. RLC 108
laboratory time/location:	Th, 8:30—11:00 Rohr Science 165
office hours:	MWF: 1:00—2:30 p.m.

If you have any questions about the material in this course, feel free to contact me via email or phone. You can also discuss the material before or after class meetings.

Course Description:
This course examines how different organ systems work and interact with each other to maintain homeostasis in the human body. The course specifically examines metabolism, the digestive system, the nervous system, the endocrine system, locomotion, respiration, the cardiovascular system, and the urinary system. 3 units

Co-requisite: Bio 4023L
This advanced human physiology laboratory is a co-requisite for Bio 4023. Students enrolled in Bio 4023 must be enrolled in Bio 4023L, and vice versa. If Bio 4023 is dropped, Bio 4023L must also be dropped. Offered every year. Letter graded. 1 unit

Prerequisites: Biology 2012 and Chemistry 2094:
According to the university catalog Bio 2012 *Organismal Biology* and Che 2094 *Organic Chemistry I* (or their equivalents) are prerequisites for Advanced Human Physiology.

Student Learning Outcomes:
1. You will understand and explain the basic physiology of the human body's systems (metabolism, digestive, nervous, endocrine, locomotor, respiratory, cardiovascular, urinary).
2. You will be able to articulate how a disruption in one body system can adversely affect the function of another body system.
3. You will be able to read, analyze and report on papers from the primary literature.
4. You will be able to carry out, analyze and write up laboratory experiments.

Required Text:
Silverthorn, Human Physiology, 7th ed (Pearson, 2015).
Journal articles for discussion; information about accessing these documents will be posted in Canvas (canvas.pointloma.edu).

Studying:
It is highly recommended that you **study at least 2-3 hours for every lecture hour**. Since Bio 4023 + Bio 4023L are worth four credits, **you should be studying 8-12 hours every single week, throughout the week**—and not just the week prior to an exam. While studying includes reading the assigned text, you should concentrate on the lecture material presented in class. Make sure that you

both ***memorize*** the information and ***understand*** the material. Various study tips will be given in class throughout the semester.

Do not use any study materials from students who have previously taken this class. This includes notes, exams, presentations, essays and laboratory write-ups.

Laptop Policy:

On occasion, we will use laptop computers in the lab. In the classroom, however, laptops tend to interfere with your education and can serve as a distraction for your neighbors. Numerous studies (some highlighted here) have confirmed that classroom laptop use can be detrimental to learning. For this reason, I do not allow the use of laptops or other electronic devises in the classroom.

1. Laptops and other electronic devises enable more than just note-taking, introducing numerous distractions (web-surfing, homework for other classes, social media, etc.) for you and your neighbors. You may think that you can multitask, but studies show you can't. http://www.slate.com/articles/health_and_science/science/2013/05/multitasking_while_studying_divided_attention_and_technological_gadgets.html
2. As already mentioned, using your laptop in class can be less than neighborly. Your classmates' grades can also suffer due to the distracting pull of the laptop. https://www.sciencedirect.com/science/article/pii/S0360131512002254
3. Writing is a more effective way of learning material than is typing. With typing, each letter is pretty much the same thing for the brain. Writing, however, uses different muscle groups with each word and encourages the brain to integrate material during the writing process. Typing may be easy and fast, but by making the brain passive, it discourages learning. https://www.npr.org/2016/04/17/474525392/attention-students-put-your-laptops-away
4. Using electronic devises in class also impairs long-term retention, with one study suggesting that cellphone use in class can lower one's grade by half a letter grade. https://www.insidehighered.com/news/2018/07/27/class-cellphone-and-laptop-use-lowers-exam-scores-new-study-shows

Journal Articles

As indicated on the schedule, during the semester you will be responsible for reading several assigned journal articles. Specific questions will be assigned with each article. You will be responsible for typing up and submitting the answers via Canvas (canvas.pointloma.edu) to these questions prior to the date of discussion. Credit for this assignment requires (1) typed answers submitted on time, (2) attendance on day of discussion, and (3) timely submission of written feedback.

Exams:

Exams will be administered during the laboratory times, on the dates indicated in the schedule. If an exam needs to be rescheduled due to an illness or a school-related activity, students must notify me **in advance** of the need to reschedule the exam. **The final exam cannot be rescheduled.**

Laboratory Participation:

It is **not** possible to schedule make-up labs. Come prepared for the laboratory exercise by reading the materials supplied ahead of time. Laboratory exercises will be posted to Canvas (canvas.pointloma.edu) at least two days prior to the lab. If possible, save a tree by printing these handouts as double-sided copies.

- **No food (including gum) or drinks in the laboratory.** This includes when you are in the lab for lecture exams.
- At the end of each laboratory period make sure that your table, and the equipment you've used, has been **cleaned and all materials returned to its appropriate place**. Points will be deducted for messes not cleaned up.

Laboratory assignments will be due as announced in lab.

- **You will not be allowed to hand in a laboratory write-up for a lab you did not attend**. In general, laboratory write-ups will need to be typed.
- Late lab write-ups will not receive full credit.
- Be sure that when you are asked to write up an individual laboratory report that this report reflects your own work, and not someone else's. This means that you can discuss the assignment with your classmates, but that you cannot copy their answers. Students who hand in identical assignments will not be given any credit for that particular assignment.

Evaluation:

Based on an expected 620+ total points

Following each exam, I will provide an update on the total points you have earned up until that point, along with the total possible points. I will not post your grades on Canvas. Instead, I expect that you can calculate your own grade based on the quizzes, exams, and assignments that have been returned.

Your grade for Bio 4023 and Bio 4023L will be calculated together and the same grade applied to both.

- 300 points—3 exams (100 points/exam)
- 100 points—final, cumulative exam
- 150 points—journal articles (4 articles)
  - 60 points—reading and answering questions (15 points/article)
  - 15 points—evaluating presentations
  - 75 points—group presentation
- 70 points for laboratory write-ups
- other assignments may be given in class as deemed appropriate

Your letter grade will be determined from your cumulative percent score as follows:

A:	93.0—100%	**B-**:	80.0—82.99	**D+**:	67.0—69.99
A-:	90.0—92.99	**C+**:	77.0—79.99	**D**:	63.0—66.99
B+:	87.0—89.99	**C**:	73.0—76.99	**D-**:	60.0—62.99
B:	83.0—86.99	**C-**:	70.0—72.99	**F**:	≤ 59.99

Other Academic Issues:

PLNU COPYRIGHT POLICY

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See Academic Policies for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See Disability Resource Center for additional information.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See Academic Policies in the Undergraduate Academic Catalog.

LAPTOP COMPUTERS:

I recognize that portable computers may be the preferred method for students to take notes in this class and I support those students who choose this method. Computers, however, can become a distraction as they also can enable activities other than note-taking. These activities are not only a distraction to you, but they are also a distraction to the students around you. Thus I am placing a ban on all computer activities that are not directly related to this class during the course of the lecture and lab periods. Failure to comply with this restriction will result in the loss of your privilege to use computer during class and may result in the loss of this privilege by all of the students in this class.

Tentative Lecture Schedule		
Sept 4 (W)	Introduction to Physiology	chp. 1
Sept 5 (Th)	*Lab: Get Acquainted Meetings*	
Sept 6 (F)	Animal Research	

Sept 9 (M)	Molecular Interactions	chp. 2
Sept 11 (W)	Metabolism and Energy Balance—1	chp. 4 & 22
Sept 12 (Th)	*Lab: Metabolism and Temperature in Rats*	
Sept 13 (F)	Clinical Research	

Sept 16 (M)	Metabolism and Energy Balance—2	chp. 4 & 22
Sept 18 (W)	Metabolism and Energy Balance—3	chp. 4 & 22
Sept 19 (Th)	*Lab: Effects of Castration on Juvenile Male Rats—1*	
Sept 20 (F)	Membrane Dynamics—1	chp. 5 pp. 123-136

Sept 23 (M)	Membrane Dynamics—2	chp. 5 pp. 153-160
Sept 25 (W)	**FREE DAY**	
Sept 26 (Th)	***Lab: Exam 1***	
Sept 27 (F)	Communication, Integration, and Homeostasis	chp. 6

Sept 30 (M)	Introduction to the Endocrine System	chp. 7
Oct 2 (W)	Introduction to the Endocrine System	chp. 7
Oct 3 (Th)	*Lab: Journal Article #1*	
Oct 4 (F)	Neurons	chp. 8

Oct 7 (M)	Neurons	chp. 8
Oct 9 (W)	The Central Nervous System	chp. 9
Oct 10 (Th)	*Lab: Effects of Testosterone on Juvenile Male Rats—2*	
Oct 11 (F)	Sensory Physiology: Background [touch, chemical senses]	chp. 10

Oct 14 (M)	Sensory Physiology [inner ear: balance and hearing]	chp. 10
Oct 16 (W)	Sensory Processes [vision]	chp. 10
Oct 17 (Th)	*Lab: Journal Article #2*	
Oct 18 (F)	Autonomic Nervous System	chp. 11

Oct 21 (M)	Muscles	chp. 12
Oct 23 (W)	**FREE DAY**	
Oct 24 (Th)	***Lab: Exam 2***	
Oct 25 (F)	**HOLIDAY: FALL BREAK**	

Oct 28 (M)	Muscles	chp. 12
Oct 30 (W)	Cardiovascular Physiology	chp. 14
Oct 31 (Th)	*Lab: Weight of the Nation*	
Nov 1 (F)	Cardiovascular Physiology	chp. 14

Nov 4 (M)	Blood Flow and Blood Pressure	chp. 15
Nov 6 (W)	Blood	chp. 16
Nov 7 (Th)	*Lab: Journal Article #3*	
Nov 8 (F)	Mechanics of Breathing	chp. 17

Nov 11 (M)	Gas Exchange and Transport	chp. 18
Nov 13 (W)	The Kidneys	chp. 19
Nov 14 (Th)	*Lab: No Lab*	
Nov 15 (F)	The Kidneys	chp. 19

Nov 18 (M)	Fluid and Electrolyte Balance	chp. 20
Nov 20 (W)	**FREE DAY**	
Nov 21 (Th)	***Lab: Exam 3***	
Nov 22 (F)	Digestive System	chp. 21

Nov 25 (M)	Digestive System	chp. 21
Nov 27-29	**HOLIDAY: THANKSGIVING BREAK**	

Dec 2 (M)	Immune System	chp. 24
Dec 4 (W)	Diabetes Mellitus	
Dec 5 (Th)	*Lab: Journal Article #4*	
Dec 6 (F)	Reproduction [Sexual differentiation]	chp. 25

Dec 9 (M)	Reproduction [Male physiology]	chp. 25
Dec 11 (W)	Reproduction [Female physiology]	chp. 25
Dec 12 (Th)	*Lab: No Lab*	
Dec 13 (F)	Reproduction [Pregnancy and Lactation]	chp. 25

Dec 16 (M)	**FINAL EXAM, 7:30—10:00a.m.**	