

Bio 4023: Advanced Human Physiology  
3 units  
Bio 4023L: Advanced Human Physiology lab  
1 unit  
Point Loma Nazarene University  
Fall 2020

Online

<b>instructor:</b>	Dr. Rebecca J. Flietstra
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<b>lecture time:</b>	MWF: 8:30—9:25 a.m. PT
<b>laboratory time:</b>	Th, 8:30—11:00 a.m. PT
<b>office hours (Zoom):</b>	MWTh: 1:00—3:00 a.m. PT

If you have any questions about the material in this course, feel free to participate in the Zoom office hours or to contact me via email.

#### 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*, 7<sup>th</sup> ed\_(Pearson, 2015).

Journal articles for discussion; information about accessing these documents will be posted in Canvas (canvas.pointloma.edu).

## Studying:

In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 3 unit class delivered over 15 weeks. It is anticipated that students will spend a minimum of 37.5 participation hours per credit hour on their coursework. For this course, students will spend an estimated 112.5 total hours meeting the course learning outcomes. The time estimations are provided in the Canvas modules.

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.

## 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](https://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](https://canvas.pointloma.edu)) at least two days prior to the lab. If possible, save a tree by printing these handouts as double-sided copies.

Laboratory assignments will be due as announced in lab/on Canvas.

- ↗ 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 675+ 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
- 40 points—attendance at Monday lectures
- 85 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:**

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

## Other Academic Issues:

### STATE AUTHORIZATION

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on [State Authorization](#) to view which states allow online (distance education) outside of California.

### INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. Incompletes will only be assigned in extremely unusual circumstances.

### 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

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center ([DRC@pointloma.edu](mailto:DRC@pointloma.edu) or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the

**To Teach ~ To Shape ~ To Send** Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

### **PLNU ATTENDANCE AND PARTICIPATION POLICY**

Regular and punctual attendance at all **synchronous** class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions (virtual or face-to-face), the faculty member will issue a written warning of 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. In some courses, a portion of the credit hour content will be delivered **asynchronously** and attendance will be determined by submitting the assignments by the posted due dates. See [Academic Policies](#) in the Undergraduate Academic Catalog. If absences exceed these limits but are due to university excused health issues, an exception will be granted. **Asynchronous Attendance/Participation Definition**

A day of attendance in asynchronous content is determined as contributing a substantive note, assignment, discussion, or submission by the posted due date. Failure to meet these standards will result in an absence for that day. Instructors will determine how many asynchronous attendance days are required each week.

### **SPIRITUAL CARE**

Please be aware PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith. If students have questions, a desire to meet with the chaplain or have prayer requests you can contact the [Office of Spiritual Development](#)

### **USE OF TECHNOLOGY**

In order to be successful in the online environment, you'll need to meet the minimum technology and system requirements; please refer to the [Technology and System Requirements](#) information. Additionally, students are required to have headphone speakers compatible with their computer available to use. If a student is in need of technological resources please contact [student-tech-request@pointloma.edu](mailto:student-tech-request@pointloma.edu).

Problems with technology do not relieve you of the responsibility of participating, turning in your assignments, or completing your class work.

## Tentative Lecture Schedule

Monday lectures will be offered live via Zoom (synchronous); links posted in Canvas  
 Wednesday and Friday lectures will be posted as YouTube videos (asynchronous); links posted in Canvas

Thursday labs will generally be asynchronous. However, exams and article presentations are scheduled during these lab times and will always be synchronous.

Date	Topic	Reading
<b>Aug 17 (M)</b>	Introduction to Physiology	chp. 1
<b>Aug 19 (W)</b>	Molecular Interactions	chp. 2
<i>Aug 20 (Th)</i>	<i>Lab: Get Acquainted Videos</i>	
<b>Aug 21 (F)</b>	Animal Research	

<b>Aug 24 (M)</b>	Metabolism and Energy Balance—1	chp. 4 & 22
<b>Aug 26 (W)</b>	Metabolism and Energy Balance—2	chp. 4 & 22
<i>Aug 27 (Th)</i>	<i>Lab: Rat Metabolism</i>	
<b>Aug 28 (F)</b>	Metabolism and Energy Balance—3	chp. 4 & 22

<b>Aug 31 (M)</b>	Membrane Dynamics—1	chp. 5: pp. 123-136
<b>Sep 2 (W)</b>	Membrane Dynamics—2	chp. 5: pp. 153-160
<i>Sep 3 (Th)</i>	<i>presentation: Journal Article #1</i>	
<b>Sep 4 (F)</b>	Clinical Research	

<b>Sep 7 (M)</b>	Communication, Integration, & Homeostasis	chp. 6
<b>Sep 9 (W)</b>	<b>FREE DAY</b>	
<i>Sep 10 (Th)</i>	<i>Lab: Exam 1</i>	
<b>Sep 11 (F)</b>	Introduction to the Endocrine System	chp. 6

<b>Sep 14 (M)</b>	Introduction to the Endocrine System	chp. 6
<b>Sep 16 (W)</b>	Neurons	chp. 8
<i>Sep 17 (Th)</i>	<i>Lab: Rat Castration</i>	
<b>Sep 18 (F)</b>	Neurons	chp. 8

<b>Sep 21 (M)</b>	The Central Nervous System	chp. 9
<b>Sep 23 (W)</b>	Sensory Physiology: Background [touch, chemical senses]	chp. 10
<i>Sep 24 (Th)</i>	<i>presentation: Journal Article #2</i>	
<b>Sep 25 (F)</b>	Sensory Physiology [inner ear: balance and hearing]	chp. 10

<b>Sep 28 (M)</b>	Sensory Processes [vision]	chp. 10
<b>Sep 30 (W)</b>	Autonomic Nervous System	chp. 11
<i>Oct 1 (Th)</i>	<i>Lab Appendicular Skeleton</i>	
<b>Oct 2 (F)</b>	Muscles	chp. 12

<b>Oct 5 (M)</b>	Muscles	chp. 12
<b>Oct 7 (W)</b>	<b>FREE DAY</b>	
<i>Oct 8 (Th)</i>	<i>Lab: Exam 2</i>	
<b>Oct 9 (F)</b>	Cardiovascular Physiology	chp. 14

<b>Oct 12 (M)</b>	Cardiovascular Physiology	chp. 14
<b>Oct 14 (W)</b>	Blood Flow and Blood Pressure	chp. 15

Oct 15 (Th)	<i>presentation: Journal Article #3</i>	
<b>Oct 16 (F)</b>	Blood	chp. 16
<b>Oct 19 (M)</b>	Mechanics of Breathing	chp. 17
<b>Oct 21 (W)</b>	Gas Exchange and Transport	chp. 18
Oct 22 (Th)	<i>Lab: Sheep Heart Dissection</i>	
<b>Oct 23 (F)</b>	The Kidneys	chp. 19
<b>Oct 26 (M)</b>	The Kidneys	chp. 19
<b>Oct 28 (W)</b>	Fluid and Electrolyte Balance	chp. 20
Oct 29 (Th)	<i>Weight of the Nation</i>	
<b>Oct 30 (F)</b>	Digestion	chp. 21
<b>Nov 2 (M)</b>	Digestion	chp. 21
<b>Nov 4 (W)</b>	<b>FREE DAY</b>	
Nov 5 (Th)	<i>Lab: Exam 3</i>	
<b>Nov 6 (F)</b>	Diabetes Mellitus	
<b>Nov 9 (M)</b>	Reproduction [Sexual differentiation]	chp. 25
<b>Nov 11 (W)</b>	Reproduction [Male physiology]	chp. 25
Nov 12 (Th)	<i>presentation: Journal Article #4</i>	
<b>Nov 13 (F)</b>	Reproduction [Female physiology]	chp. 25
<b>Nov 16 (M)</b>	Reproduction [Pregnancy and Lactation]	chp. 25
<b>Nov 18 (W)</b>	Immune System	chp 24
Nov 19 (Th)	<i>No Lab</i>	
<b>Nov 20 (F)</b>	<b>FREE DAY</b>	
<b>Nov 23 (M)</b>	<i>Optional Finals Review</i>	
<b>Dec 2 (W)</b>	Final, 7:30—10:00am PT	