

BI 121 Introduction to Human Physiology Syllabus
University of Oregon, Department of Biology
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Introduction: *Human Physiology* is the study and *science of function in humans*— how processes work at cell, organ, tissue and body system levels of organization or as Lauralee Sherwood says, what makes us tick! It is a wonderfully broad and demanding field that encompasses many disciplines including anatomy, animal physiology, biochemistry, cell biology, environmental and exercise physiology, histology, immunology, mathematics, medical physiology, molecular biology, nutrition, pathophysiology (the study of diseases), physics, and systems physiology! The focus varies based on interest and the adjective used in front of the word *physiology*. For example, the goal of *comparative* physiology is to contrast functions across the animal kingdom. Exercise physiology studies adaptations, primarily in humans, to unique modes of exercise. Environmental physiology investigates specific adaptations due to environmental stressors like high vs. low altitudes and cold vs. hot climates. Viral physiology or virology examines mechanisms in viruses, infectious, microscopic, genetic material in a protein coat, found in almost all ecosystems on earth. Certainly, there is much overlap among subdisciplines. Though we will discuss examples from many areas of physiology, our primary focus will be to study humans under normal, healthy conditions at the organ and body systems levels. Topic coverage includes homeostasis, basic cell physiology and genetics, and physiology of the gut, heart, vessels, blood, glands, brain, nerves, muscles and lungs. Nutrition and exercise physiology are included to make the material more applicable to daily activities and to promote optimal choices, body awareness and health for a lifetime! Ultimately, I hope that you enhance your appreciation and understanding of the intricate and miraculous nature of the human body and apply what you learn throughout your life.

Prerequisites: BI 121 has no prerequisites and those who are new students, exploring or with any major are encouraged to enroll. BI 121 helps U of O students satisfy their Natural Science Area of Inquiry requirement. However, because no assumptions are made about backgrounds in science or math and the course is taught largely to beginning, non-science majors at the 100-level, our approach will be more descriptive (*what* and *where*), correlational (demonstrating *how* two or more variables are related) and purpose-driven (*why*) rather than mechanistic (*how*).

Organization: I would like to implement a reverse classroom plan, whereby you read materials, review Lecture and Lab *.pdfs* and *.mp4s* and attempt to answer Active Learning Questions and Worksheets prior to attending optional Discussions each day. Your efforts outside of these optional discussions will make you well prepared and enable all of us to engage in each topic at a deeper level and interact more fully and learn together. Discussions Monday through Thursday are optional, but strongly encouraged, assuming you can make them based on your time zone and personal schedule. They are extremely helpful in completing Active Learning Questions and Lab Worksheets and particularly for reviewing and preparing for all Quizzes. Please let me know if you have any questions or need additional information or resources. I would be delighted to help you further!

Objectives: By the end of the course, you should be able to complete these dozen learning objectives:

- describe the concept of homeostasis and identify key categories of variables balanced within the extracellular fluid compartment.
- apply a simplified homeostatic model to the regulation of unique input variables that ensure that body systems maintain homeostasis leading to cell survival.
- explain the basic structure and function of cells and cell organelles.
- compare and contrast anaerobic and aerobic metabolism and assign specific exercises to unique areas of the energy continuum.
- distinguish structures and functions of deoxyribonucleic and ribonucleic acids (DNA & RNA).
- discuss the flow of information from the nucleus to cytoplasm, from DNA to RNA to protein.
- paraphrase nutrition and exercise guidelines established by the US Government, the American Institute for Cancer Research, the American Heart Association and the American College of Sports Medicine.
- identify the common characteristics of the world's longest-lived people in [Blue Zones](#).
- analyze the nutrient content of your personal diet relative to national guidelines and make recommendations for self-improvement.
- articulate and debunk common myths about nutrition and exercise.
- summarize the basic structure and function of the gastrointestinal, cardiovascular, endocrine, nervous, skeletal muscular and respiratory systems.
- describe the physiology and inherent multi-organ risks of cigarette smoking and vaping.

Texts & References: BI 121 is designated as a low-cost course because all materials required cost less than 50 US dollars.

Lecture: You have a choice of textbooks for the lecture-discussion component of the course based on personal finances and your reading and studying styles. Below are the two choices:

Sherwood, Lauralee (LS). *Fundamentals of Human Physiology, 4th ed.* Belmont, CA: Brooks/Cole, Cengage Learning, 2012, ISBN-13:0840062253. Digital rental or purchase, used or new textbook.

AND/OR

Chiras, Daniel D. (DC). *Human Body Systems: Structure, Function and Environment, 2nd ed.* Burlington, MA: Jones and Bartlett Learning, 2013, ISBN 9781449647933. Digital rental or purchase, a used textbook is likely more available than a new one.

Sherwood's *Fundamentals* (called *the little book* because Dr. Sherwood wrote a more advanced physiology text) is over 600 pages, while Chiras' book is more like a packet containing 170 pages. Sherwood's text also contains cell physiology and genetics sections whereas Chiras' book does not, as it is entirely at the body systems level. However, Chiras' book contains a short nutrition chapter, whereas Sherwood's does not. For nutrition, I will rely uponSizer and Whitney's (S&W) *Nutrition Concepts & Controversies* and many other sources (see below nutrition links and course outline), but it is not necessary that you purchase any additional references beyond books by Sherwood and/or Chiras. Sherwood and Chiras options are in a semi-reasonable price range (\$25 - \$40) for the 120- or 180-d digital version access. Sherwood's hard copy is far more expensive than Chiras'. Our lectures are in the middle between the lighter nature of Chiras and the more expanded details of Sherwood. Both are excellent writers.

For nutrition, I will provide you with the information you need in recorded lectures, labs and discussions, so certainly you do not have to purchase a nutrition text. If you are interested in the exactSizer & Whitney resource listing, I have printed it below. Please contact me directly if you have questions or desire additional resources.

Sizer, Frances S. & Whitney, Eleanor N. (S&W). *Nutrition: Concepts & Controversies*, 15th, 14th, 13th or 12th ed. Boston, MA: Cengage Learning, 2020, 2017, 2013 or 2010 or other peer-reviewed nutrition textbook.

See also outstanding nutrition resources below:

<https://www.myplate.gov/>, <https://www.eatright.org>, <https://www.nutrition.gov/>,
<https://www.nutritionletter.tufts.edu/>, <https://health.gov/our-work/food-nutrition>,
<https://www.cspinet.org/advocacy/nutrition>, <https://nutritionfacts.org/>,
<https://www.hsph.harvard.edu/nutritionsource/>, <https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/nutrition-basics>, <https://www.aicr.org/cancer-prevention/healthy-eating/>, <https://www.nhlbi.nih.gov/health/educational/wecan/tools-resources/nutrition.htm>, <https://mynutrition.wsu.edu/nutrition-basics>

Lab:

The Lab Manual contains all of the background and the worksheets for our 6 labs. It is usually for sale at the U of O Duckstore (Bookstore) for ~ \$10 – \$15, but it is free this term because I am posting the Lab Backgrounds and Worksheets for you online on Canvas. The postings are associated with each specific lab. So, the Lab Manual is not really all in one place, but dispersed throughout our Canvas site with links for specific sections posted exactly where and when you need them. The specific reference for the Lab Manual is listed below:

Lombardi VP, Evonuk E & Carmack MA (LM). *BI 121, Introduction to Human Physiology, Laboratory Manual*. Supplied free as Lab Backgrounds and Worksheets on Canvas.

Canvas Site:

The Canvas link for our course is <https://canvas.uoregon.edu/courses/223573>. We will be building our Canvas site as we proceed throughout the term to ensure that we are as up to date as possible. I will post on Canvas all Active Learning Questions, Lectures, Lab Worksheets and Labs for the following week at least by the preceding Saturday. All Lecture Active Learning Questions and Lab Worksheets should be submitted by way of Canvas. Most are due the same night of the lecture or lab, although there are a few exceptions.

Assignment Submissions:

Be sure to see [Guide for Active Learning Questions + Worksheets](#) on Canvas. Please submit your assignments using the original posted Word .docx templates (rather than converting to .pdfs, .jpegs, or .pages formats) and answer all parts of each question using as few key words as possible (rather than complete sentences). Doing so ensures you will maximize your score and makes it much easier for us to grade and make comments. Formats like .pages are inaccessible on Canvas and .jpegs have issues with size and orientation making them difficult to decipher especially when images or pictures of hand-written documents are uploaded. In your answers, do not repeat the stem of a question, but simply provide the answer by typing very few key words in the space provided on the original .docx template. If you need examples or further explanation of these steps, please let us know. Thank you sincerely for adhering to all of the above requirements. Doing so will ensure that you do your very best and at the same time help us with grading!

Resources:

Please, please rely on course resources 1st and foremost rather than reflexively search for answers on the worldwide web. Our course materials provided on Canvas are highly specific to human physiology. You can find most of the answers easily to all assignment questions by looking through the posted *.pdfs* for lectures and labs. Of course, you will glean far more details and a more complete grasp of concepts by listening to the *.mp4s* designed to be 30 minutes or less for lectures and 50 min or less for labs. This also will help you best prepare for discussions and quizzes. When grading assignments, we can tell instantly when a student has lifted materials directly from web sources. We will not accept copied-and-pasted answers from the web and you will not receive credit if you do this. While we encourage discussion and collaboration, we will not permit plagiarism or presenting someone else's work as your own. Please see <https://researchguides.uoregon.edu/citing-plagiarism/plagiarism> for more details about how to identify and avoid plagiarism.

Intensity:

Physiology is akin to learning an entirely new language. Even though this introductory course does not assume that you have a science and math background, it does proceed at a relatively rapid pace. Keep in mind that a 4-wk summer course is 2.5 times more (10 divided by 4) intense than the regular academic year, 10-wk term, so compressed substantially. The condensed timeframe makes it tough to have that all-important incubation period, so several repetitions and rest periods between study sessions are crucial. You can help ensure that you will do well if you are as consistent as the sun in studying, are proactive about scheduling and keeping up with the material and if your schedule permits, attend Discussion sessions. Active Learning Questions and Lab Worksheets are due in most cases on the same night of the scheduled earlier sessions and Quizzes are on Fridays. So, it is important to keep up consistently with the work in order to do your very best! Remember, the benefits you gain will be directly proportional to the efforts you invest! By the end of the term, we will have learned much practical, life-long information together and had fun, too!

Late Assignments & Makeup Quizzes:

Without Accessible Education Center (AEC) accommodations, late assignments & makeups will not be permitted except in extreme circumstances (e.g., birth, death or severe illness). The maximum extension is 48-hr and without documentation, 20% will be deducted for each 24-hr increment. For example, the maximum score for an on-time submission is 100%, 24-hr late submission is 80%, 48-hr late submission is 60%, while no credit will be given for assignments 48 hr beyond the due date.

Requirements & Estimated Time*:

- * All estimated times may differ based on Accessible Education Center (AEC) accommodations. Please visit <https://aec.uoregon.edu/using-aec-connect> to contact the outstanding AEC staff.
- Read, take notes and study the pages listed on your course outline in your textbooks (LS, Lauralee Sherwood and/or DC, Daniel Chiras) and your Lab Manual (LM) prior to attending optional Discussions. You must do so daily to provide the foundation needed to keep up with the pace and do well in the course, especially during the summer.
Estimated time = 30 – 60 min per session
- Participate in all Lectures by viewing *.pdfs* and *.mp4* videos online on Canvas.
Estimated time = 45 – 60 min per session

- Complete Active Learning Questions and submit by due date before 11:59:59 pm on Canvas. To prime yourself for what to look for, glance at the questions before viewing the lecture .pdfs and .mp4s. Rely on course resources and use as few words as possible when completing your answers. Short words or phrases with arrows or flow charts are fine. Do not repeat the stem of the question. Be sure to see [Guide for Active Learning Questions + Worksheets](#).
Estimated time = 15 – 45 min per Lecture
- Participate in all Labs by viewing .pdfs and .mp4 videos online on Canvas.
Estimated time = 45 – 60 min per Lab
- Complete Lab Worksheets and submit by way of Canvas by 11:59:59 pm the night of lab (except when noted otherwise). Again, to prime yourself for what to look for, glance at the questions before viewing the lab .pdfs and .mp4s. Rely on course resources and use as few words as possible. Be sure to see [Guide for Active Learning Questions + Worksheets](#).
Estimated time = 15 – 90 min per Lab
- Discussions Monday thru Thursday are optional, but strongly encouraged, assuming you can make them based on your time zone and personal schedule. They are extremely helpful in completing assignments and particularly for reviewing and preparing for all quizzes. Quiz preparation is designed to be fun and interactive, as we will participate in Jeopardy Games.
Estimate optional time = 60 – 90 min per Discussion
- Complete 4 weekly online Canvas Quizzes covering Active Learning Q, Lectures, Worksheets and Labs for the week. Quizzes will be open only on Fridays, from 12 n until 12 midnight, US PDT. [There is one exception, based on summer session scheduling, the last Quiz 4 is on a Thursday during the final week of the term.] Grades will be tabulated in Canvas.
Estimated time = 30 – 40 min per Quiz but varies based on Accessible Education Center accommodations.

Quiz Directions:

Each quiz is open book, but not open communication or conversation. You may use your textbook/s and lecture and lab notes, however, once you begin, you are not allowed to communicate with others, including classmates, family members or any humans (or telepathic animals!) by any communication means including by cell phone, texting, instant messaging, Facebook, Twitter, Zoom, e-mail or Morse code! You may not take pictures or use snipping tools to capture quiz questions and you may not use open artificial intelligence like ChatGPT to answer questions. Your starting each test acts as a pledge ensuring that your work is yours alone independently, and that you have not engaged or will not engage in any communication, conversation or any dishonesty, plagiarism, preconceived scams, copying or revealing of quiz questions. I want you to know that 1st and foremost, I was raised to value and respect the utmost of integrity and that I hold you to these highest of possible standards! Even though you can use your notes, text/s, Active Learning Questions and Lab Worksheets, you should be able to answer questions without referring to these and the time allotment will not enable you to search and discover answers while you are taking the quiz. Once you start the quiz, you will have 40 minutes to complete it, unless you have received additional time for AEC accommodations.

Grading:

The grading for the course is as follows:

10% Lecture Active Learning Questions submitted on Canvas

10% Lab Worksheets submitted on Canvas

80% Quizzes (20% for each of the 4 weekly Quizzes tabulated online by Canvas)

BI 121 Tentative Outline:

Week 1

Jun 26 (M)

Lecture 1. Anatomy, Physiology & Homeostasis I (Complete on Canvas on your own time prior to Discussion). I. **Introduction** ([outline](#), text, [grading expectations...](#)

[Download grading, expectations...](#)); Compare & Contrast Human Anatomy & Human Physiology; Body Levels of Organization. II. Homeostasis I. **Readings:** *ch 1 vignette p 0, ch 1 pp 1-10* (LS); *Introduction, Study Skills, pp iii-viii; Module 1, pp 1-8* (DC). **Assignment:** **Active Learning Questions Lecture 1**. Submit on Canvas by 11:59:59 pm, US PDT.

Jun 26 (M)

Optional Zoom Discussion

[Links to an external site.](#) 11 am - 12 n +, US PDT.

Jun 27 (T)

Lecture 2. Homeostasis II, Cell Physiology (Complete on Canvas on your own time prior to Discussion). I. Homeostasis II: – Negative vs + Positive Feedback; Simplified Homeostatic Model Balance Examples: Temperature & Blood Pressure. II. Cell Anatomy, Physiology & Compartmentalization: Size; Basic Survival Skills; Organelles. **Readings:** *ch 1, pp 11-17; ch 2, pp 18-27* (LS). **Assignment:** **Active Learning Questions Lecture 2**. Submit on Canvas by 11:59:59 pm, US PST.

Jun 27 (T)

Lab 1. Introduction to Anatomy & Physiology (Complete on Canvas on your own time prior to Discussion). **Readings:** [pp i - iii](#)

[Download pp i - iii, 1-1 to 1-11](#)

[Download 1-1 to 1-11](#) (LM). **Assignments:** **Introduction Card + Lab 1 Worksheet**. Submit on Canvas by 11:59:59 pm, US PST.

Jun 27 (T)

Optional Zoom Discussion

[Links to an external site.](#). 11 am - 12 n +, US PDT.

Jun 28 (W)

Lecture 3. Anaerobic *vs* Aerobic Metabolism (Complete on Canvas on your own time prior to Discussion). I. Metabolism: Anaerobic (ATP-PC, Glycolytic) vs Aerobic; Subcategory Location & ATP Production. II. Cytoskeleton. **Readings:** *ch 2, pp 26-41* (LS). **Assignment:** [Active Learning Questions Lecture 3](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jun 28 (W)

Optional Zoom Discussion

[Links to an external site.](#). 11 am - 12 n +, US PDT.

Jun 29 (R)

Lecture 4. Genetics: DNA, RNA & Proteins (Complete on Canvas on your own time prior to Discussion). **Readings:** *Appendix B, pp A-16, A-17; Appendix C, pp A-18 to A-26* (LS). **Assignment:** [Active Learning Questions Lecture 4](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jun 29 (R)

Lab 2. Histology: Microscopic Study of Tissues (Complete on Canvas on your own time prior to Discussion). **Readings:** [pp 2-1 to 2-4](#)

[Download pp 2-1 to 2-4](#) (LM). **Assignment:** [Lab 2 Worksheet](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jun 29 (R)

Discussion on Zoom & Review for Quiz 1

[Links to an external site.](#) **Activity: Jeopardy Game 1.** 11 am – 12 n +, US PDT.

Jun 30 (F)

Quiz 1 on Canvas. Covers Lectures 1 – 4 and Labs 1 & 2. Open 12 n until 11:59:59 pm, US PDT.

Week 2

Jul 3 (M)

Lecture 5. Nutrition & Disease Prevention (Complete on Canvas on your own time prior to Discussion). I. Nutrition in the News. II. Standard Serving Sizes: Estimating for Dietary Analyses. III. Nutrients Essential for Life: Water, Energy Nutrients (1^o Carbohydrates, 2^o Fats, 3^o Proteins), Vitamins & Minerals. IV. Blue Zones & Diets of the World's Longest-lived People. V. What about Paleo & Red Meat? VI. Exercise, Dieting or Both? VII. Nutrition Quackery. **Readings:** *ch 16 pp 485-6 (LS); Module 2, pp 9-16 (DC); [Highlights of ch 1, 2, pp 1-69; ch 9, pp 334-80 (S&W)]; See links on Outline p 1 under 1^o Supplemental Text.* **Assignment:** [Active Learning Questions Lecture 5](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jul 3 (M)

Optional Zoom Discussion

[Links to an external site.](#) 11 am - 12 n +, US PDT.

Jul 4 (T)

Happy Independence Day. No Discussion or Assignments Due.

Jul 5 (W)

Lecture 6. Gastrointestinal System (Complete on Canvas on your own time prior to Discussion). I. Hydrolysis, the Central Theme of Digestion. II. Gut Anatomy, Histology & General Secretions. III. Enzymatic Digestion, Absorption & Defecation. **Readings:** *ch 15, pp 436-445; focus on Table 15-1 pp 440-441 (LS). Module 3, pp 17-23 (DC); [ch 15, pp 445-459, 463-477 (LS)].* **Assignment:** [Active Learning Questions Lecture 6](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jul 5 (W)

Lab 3. Nutrition Analyses (Complete on Canvas on your own time prior to Discussion). Record your diet for at least one day and analyze it using *ASA 24 National Cancer Institute Calorie Counter & Food Diary, Cronometer Nutrition Tracker, HealthyOut, My Fitness Pal* or other smart phone software. **Readings:** [pp 3-1 to 3-16](#)

Download [pp 3-1 to 3-16 \(LM\)](#). **Assignment:** [Lab 3 Worksheet](#). Submit on Canvas by 11:59:59 pm, US PDT, by Saturday, July 8th, 2023.

Jul 5 (W)

Optional Zoom Discussion

[Links to an external site.](#) 11 am - 12 n +, US PDT.

Jul 6 (R)

Lecture 7. Cardiovascular System (Complete on Canvas on your own time prior to Discussion). I. Circulatory: Cardiovascular & Lymphatic. II. Cardiac Physiology: Anatomy, Adult Heart & Fetal Blood Flow. **Readings:** *ch 9, pp 228-234; ch 10, pp 281-7 (LS); Module 4, pp 25-29; 33-34 (DC)*. **Assignment:** [Active Learning Questions Lecture 7](#). Submit on Canvas by 11:59:59 pm, US PDT.

Lecture 8. Atherosclerosis & Cardiovascular Diseases (Complete on Canvas on your own time prior to Discussion). I. Atherosclerosis. II. Cardiovascular Diseases (CVDs): What's a Heart Attack (AMI)? Stroke (CVA)? Peripheral Vascular Disease (PVD)? Hypertension (HTN)? III. CVDs & Risk Reduction: What Can I Do to Lower My Risk? IV. Heart Rate & Blood Pressure? **Readings:** *ch 9, pp 252-259; ch 10, pp 266-270, 287-295 (LS); Module 4, pp 29-33 (DC)*. **Assignment:** [Active Learning Questions Lecture 8](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jul 6 (R)

Lab 4. Heart Rate, Blood Pressure & Cardiovascular Disease Risk (Complete on Canvas on your own time prior to Discussion). **Readings:** [pp 4-1 to 4-8](#)

[Download pp 4-1 to 4-8 \(LM\)](#). **Assignment:** [Lab 4 Worksheet](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jul 6 (R)

Discussion on Zoom & Review for Quiz 2

[Links to an external site.](#) **Activity: Jeopardy Game 2.** 11 am – 12 n +, US PDT.

Jul 7 (F)

Quiz 2 on Canvas. Covers Lectures 5 – 8 and Labs 3 & 4. Open 12 n until 11:59:59 pm, US PDT.

[Links to an external site.](#)

Week 3

Jul 10 (M)

Lecture 9. Blood (Complete on Canvas on your own time prior to Discussion). I. Introduction to Blood Composition: Cells vs Liquid; Red Blood Cells, White Blood Cells, Platelets vs Plasma; Plasma vs Serum. II. White Blood Cell Differentiation & Function. **Readings:** *ch 11, pp 296-304 (LS). Module 5, pp 35-9; highlights of Module 6, pp 41-9 (DC); [pp 5-1 thru 5-8](#)*

Download [pp 5-1 thru 5-8](#) (LM). **Assignment:** [Active Learning Questions Lecture 9](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jul 10 (M)

Optional Zoom Discussion

[Links to an external site.](#). 11 am - 12 n +, US PDT.

Jul 11 (T)

Lecture 10. Blood Testing (Complete on Canvas on your own time prior to Discussion). I. Blood Chemistry Review. II. Hematocrit & Blood Typing. III. Blood Glucose. IV. Diabetes Mellitus: Type I vs Type II; How Exercise & Diet Impact. **Readings:** *ch 17, pp 525-536 (LS); Module 13, pp 110-12 (DC).* **Assignment:** [Active Learning Questions Lecture 10](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jul 11 (T)

Lab 5. Blood Chemistry: Blood Glucose & Blood Typing (Complete on Canvas on your own time prior to Discussion). **Readings:** [pp 5-1 to 5-8](#)

Download [pp 5-1 to 5-8](#) (LM). **Assignment:** [Lab 5 Worksheet](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jul 11 (T)

Optional Zoom Discussion

[Links to an external site.](#). 11 am - 12 n +, US PDT.

Jul 12 (W)

Lecture 11. Endocrine System (Complete on Canvas on your own time prior to Discussion). I. Introduction to the Endocrine System: What's an Endocrine? Classifying Hormones. IV. Hypothalamus, Pituitary & Target Organs. **Readings:** *ch 4, pp 94-105; ch 17, pp 494-525 (LS); Module 13, pp 103-113 (DC).*

Assignment: [Active Learning Questions Lecture 11](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jul 12 (W)

Optional Zoom Discussion

[Links to an external site.](#) 11 am - 12 n +, US PDT.

Jul 13 (R)

Lecture 12. Nervous System (Complete on Canvas on your own time prior to Discussion). I. Nervous System & Neurons (Nerve Cells); Central (Brain & Spinal Cord) vs. Peripheral Nervous System (Afferent & Efferent Divisions); II. The Autonomic Nervous System; Fight or Flight. III. Action Potentials, Synapses & the Neuromuscular Junction. **Readings:** *ch 5, pp 106-120; ch 7, pp 178-193; highlights of ch 4, pp 70-88 (LS); Module 9, pp 67-77 (DC).* **Assignment:** [Active Learning Questions Lecture 12](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jul 13 (R)

No Lab! Study for Quiz 3!

Jul 13 (R)

Discussion on Zoom & Review for Quiz 3

[Links to an external site.](#) **Activity: Jeopardy Game 3.** 11 am – 12 n +, US PDT.

Jul 14 (F)

Quiz 3 on Canvas. Covers Lectures 9 – 12 and Lab 5. Open 12 n until 11:59:59 pm, US PDT.

Week 4

Jul 17 (M)

Lecture 13. Skeletal Muscle Structure & Function (Complete on Canvas on your own time prior to Discussion). I. Major Muscle Types; Structure of Skeletal Muscle. II. Molecular Basis of Skeletal Muscle Contraction. III. Metabolism & Fiber Types, Skeletal Muscle Adaptations. **Readings:** *ch 8, pp 194-204, 210-14* (LS); *Module 12, pp 97-102* (DC). **Assignment:** [Active Learning Questions Lecture 13](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jul 17 (M)

Optional Zoom Discussion

[Links to an external site.](#) 11 am - 12 n +, US PDT.

Jul 18 (T)

Lecture 14. Respiratory System (Complete on Canvas on your own time prior to Discussion). I. Respiratory System: Structure & Histology. II. Gas Volumes & Capacities, III. Ventilation Mechanics & Control. IV. Gas Exchange & Transport. **Readings:** *ch 12, highlights of pp 344-379* (LS); *Module 7, pp 51-57* (DC). **Assignment:** [Active Learning Questions Lecture 14](#). Submit on Canvas by 11:59:59 pm, US PDT.

Jul 18 (T)

Lab 6: Pulmonary Function Tests (Complete on Canvas on your own time prior to Discussion). **Readings:** [pp 6-1 to 6-7](#)

[Download pp 6-1 to 6-7](#) (LM). **Assignment:** [Lab 6 Worksheet](#). Submit on Canvas by 11:59:59 pm, US PST.

Jul 18 (T)

Optional Zoom Discussion

[Links to an external site.](#) 11 am - 12 n +, US PDT.

Jul 19 (W)

Lecture 15. Cigarette Smoking & Vaping (Complete on Canvas on your own time prior to Discussion). **Readings & Videos:** <https://www.lung.org/quit-smoking/smoking-facts/health-effects>

[Links to an external site., https://www.cancer.org/cancer/cancer-causes/tobacco-and-cancer.html](https://www.cancer.org/cancer/cancer-causes/tobacco-and-cancer.html) [Links to an external site., https://smokefree.gov/quit-smoking/why-you-should-quit/health-effects](https://smokefree.gov/quit-smoking/why-you-should-quit/health-effects) [Links to an external site., https://www.cdc.gov/tobacco/campaign/tips/quit-smoking/index.html](https://www.cdc.gov/tobacco/campaign/tips/quit-smoking/index.html) [Links to an external site., https://www.pbs.org/video/vaping-1576094392/](https://www.pbs.org/video/vaping-1576094392/)

[Links to an external site.;](#) *ch 11, p 340 (LS); Module 7, p 57 (DC)*. **Assignment: [Active Learning Questions Lecture 15](#)**. Submit on Canvas by 11:59:59 pm, US PST.

Jul 19 (W)

Optional Zoom Discussion

[Links to an external site.](#). 11 am - 12 n +, US PDT.

Jul 20 (R)

No Lecture or Lab. Study for Quiz 4! :)

Jul 20 (R)

Zoom Review for Quiz 4

[Links to an external site.](#). **Activity: Jeopardy Game 4.** 11 am – 12 n +, US PDT.

Jul 21 (F)

Quiz 4 on Canvas. Covers Lectures 13 – 15 and Lab 6. Open 12 n until 11:59:59 pm, US PST.