BI 121 Introduction to Human Physiology Syllabus
University of Oregon, Department of Biology
V. Pat Lombardi

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 *.pdf*s and *.mp4*s and attempt to answer Active Learning Questions and Worksheets prior to attending required Lecture Discussions on Tuesdays and Thursdays and Labs on Thursdays. Your efforts outside of these required sessions will make you well prepared and enable all of us to engage in each topic at a deeper level and more fully interact and learn together. Your full attendance and participation will be essential 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 happy 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.

<div align="center">AND/OR</div>

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 upon Sizer 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.

Again, 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 exact Sizer & 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 Worksheets and Lab Backgrounds for you online on Canvas. The postings are associated with each specific lab. So the Lab Manual is not all in one place, but rather links for specific sections are posted within our Canvas site 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 Worksheets & Lab Backgrounds on Canvas.

Canvas Site:
The Canvas link for our course is ***https://canvas.uoregon.edu/courses/206590***. 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 Friday on Canvas. All Lecture Active Learning Questions and Lab Worksheets should submitted by way of Canvas. Most are due the same night of the lecture or lab.

Assignment Submissions:
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 *.jpeg*s 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. Again, you can help us out immeasurably by using the original MS Word *.docx* templates provided on Canvas for Lecture Active Learning Questions and Lab Worksheets and using only very few key words in answering all parts of each question. It is frustrating as a grader when students omit answers to parts of a question or leave entire questions blank, as this substantially detracts from the overall score. For each assignment, we must grade ~ 200 submissions x 5 questions each (so ≥ 1000 questions per assignment) and the time required, especially when we make comments, is extraordinary. 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!

<u>Resources</u>:
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 *.pdf*s for lectures and labs. Of course, you will glean far more details and a more complete grasp of concepts by listening to the *.mp4*s designed to be 30 minutes or less for lectures and 50 min or less for labs. This also will help you best prepare for lecture and lab 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. Be sure also to review in our introductory Canvas modules, ***Guide for Active Learning Questions + Worksheets***.

<u>Intensity</u>:
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. To keep up, it is crucial that you attend and participate in all lectures and labs. You can help ensure that you will do well if you are as consistent as the sun about your attendance and participation and proactive about scheduling. Etch out a consistent time each day to study and work on assignments, so that you keep up with the material and formulate questions heading into lectures and labs. Active Learning Questions and Lab Worksheets are due in most cases on the same day of the scheduled session just before midnight and Quizzes are open from 12 n until just before 12 m on Fridays. There are several weekly assignments, so it is important to do your very best to focus and to keep up consistently with the work! 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!

<u>Late Assignments & Makeup Quizzes</u>:
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.

<u>Requirements & Estimated Time</u>* per Activity, Session or Quiz:
* 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. To estimate, for each direct contact hour, plan for 2 – 3 hours of work outside of lecture or lab.

- ◦ <u>Read, take notes and study</u> the pages in your textbooks (LS, Lauralee Sherwood and/or DC, Daniel Chiras) listed on Canvas prior to attending required Lecture Discussions. You must do so consistently to provide the foundation needed to keep up with the pace and do well in the course. Estimated time = <u>45 – 75 min</u>.
- ◦ <u>View all Lecture</u> *.pdfs* and *.mp4* videos online on Canvas prior to attending required Lectures. Estimated time = <u>30 – 50 min</u>.

- Attend & Participate in Required Lecture Discussions on Tuesdays & Thursdays. Lecture Discussions are extremely helpful in completing Active Learning questions 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 in lectures and labs. Estimated time = 80 – 85 min.
- 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 *.pdf*s and *.mp4*s. 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.
- Read pages in the Lab Manual (LM) listed on Canvas prior to attending required Labs. Estimated time = 15 – 30 min.
- View all Lab *.pdfs* and *.mp4* videos online on Canvas prior to attending required Labs. Estimated time = 45 – 60 min.
- Attend & Participate in Required Labs on Thursdays. Labs are designed to reinforce the material in lectures and are crucial for completing worksheets. Estimate time = 80 – 85 min.
- 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 *.pdf*s and *.mp4*s. 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.
- Complete 4 weekly online Canvas Quizzes covering Active Learning Q, Lectures, Worksheets and Labs. Quizzes will be open only on Fridays, from 12 n until 12 midnight, US PDT. Grades will be tabulated in Canvas.
  Estimated time = 30 – 40 min.   does not include quiz time
                Total estimated time per wk outside of class = 255 – 520 min or 4.25 – 8.67 hr

Quiz Directions:

The quizzes are open book, but not open communication or conversation. You may use your textbook/s and lecture and lab notes, however, once you begin a quiz, 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, Zoom, e-mail or Morse code! You may not take pictures or use screen capture tools to capture quiz questions. Prior to beginning a quiz, you confirm that your work is yours alone independently, and that you have not engaged 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 the highest of possible standards! Even though you can use your notes, text/s and Canvas postings, 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 a quiz. Once you start a quiz, you will have 40 minutes to complete it, unless you have received additional time for Accessible Education Center accommodations. Best of luck!

Grading:

Average scores listed on Canvas are only a rough estimate. Exact grading for the course is:

10% Lecture Attendance & Participation (determined by Lecture Attendance, completion, submission and grading of Active Learning Questions on Canvas)

10% Lab Attendance & Participation (determined by Lab Attendance, completion, submission and grading of Lab Worksheets on Canvas)

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

University of Oregon
Department of Biology

<u>Course</u>:   Introduction to Human Physiology, BI 121, 04 cr (CRN 12685), 100 WIL, TR Lecture Discussions, 08:30-9:50 and 33 KLA, Lab Discussions R: 10:00-10:50 (CRN 12930) or 11:00-11:50 (CRN 12929) or 12:00-12:50 (CRN 12928) or 13:00-13:50 (CRN 12927) or 14:00-14:50 (CRN 12926) or 15:00-15:50 (CRN 12925) or 16:00-16:50 (CRN 12924) or 17:00-17:50 (CRN 12923), Fall, 2022. <u>NB</u>: Time shift from US PDT (US Pacific Daylight Time) to PST (US Pacific Standard Time) on Sunday, November 6th @ 2:00 am (fall backwards!). :)

<u>Website</u>:   ***https://canvas.uoregon.edu/courses/206590***

<u>Lecturer; Office Hours; E-Mail; Phone</u>: V. Pat Lombardi; TBA; *Zoom* appointments + 65A KLA; ***lombardi@uoregon.edu***
541-346-6055 (office/message)

<u>Lab Instructors; Office Hours; E-Mail</u>:   Samuel Bertrand; TBA; *Zoom* appointments; ***sbertra7@uoregon.edu***
Rachael Penick; TBA; *Zoom* appointments; ***rpenick@uoregon.edu***
Monika Ruwaimana; TBA; *Zoom* appointments; ***mruwaima@uoregon.edu***
Kendal Tinney; TBA; *Zoom* appointments; ***ktinney@uoregon.edu***

<u>Lab Preparator; E-Mail</u>: Katie Perez, ***kperez@uoregon.edu***

<u>Required Texts</u>:   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.

&/OR

Chiras, Daniel D. (DC). *Human Body Systems: Structure, Function and Environment, 2nd ed.* Burlington, MA: Jones and Bartlett Learning, 2013. Digital rental or purchase, used or new textbook.

&

Lombardi VP, Evonuk E & Carmack MA (LM). *BI 121, Introduction to Human Physiology, Laboratory Manual, Fall 2020*. Supplied free as Lab Worksheets & Lab Backgrounds on Canvas.

1⁰ Supplemental Text: Readings listed in [ ] below:

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:

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.aicr.org/cancer-prevention/healthy-eating/***,
https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/nutrition-basics,
https://www.nhlbi.nih.gov/health/educational/wecan/tools-resources/nutrition.htm,
https://mynutrition.wsu.edu/nutrition-basics

<u>Tentative Outline</u>:

Sep 27 (T)   **Lecture 1 Discussion. Anatomy, Physiology & Homeostasis I** (100 WIL). I. Introduction (outline, text, 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.

Sep 29 (R)   **Lecture 2 Discussion. Homeostasis II, Cell Physiology** (100 WIL). 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 PDT.

Sep 29 (R)   **Lab 1 + Discussion. Introduction to Anatomy & Physiology** (33 KLA). **Readings:** *pp 1-1 to 1-10* (LM). **Assignments: Introduction Card + Lab 1 Worksheet.** Submit on Canvas by 11:59:59 pm, US PDT.

Oct 4 (T)   **Lecture 3 Discussion. Anaerobic *vs* Aerobic Metabolism** (100 WIL). 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.

Oct 6 (R) **Lecture 4 Discussion. Genetics: DNA, RNA & Proteins** (100 WIL). **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.

Oct 6 (R) **Lab 2 + Discussion. Histology: Microscopic Study of Tissues** (33 KLA). **Readings:** *pp i-iii, 1-1 to 1-4* (LM). **Activity in Lab: Jeopardy Game 1**. **Assignment: Lab 2 Worksheet.** Submit on Canvas by 11:59:59 pm, US PDT.

Oct 7 (F) **Quiz 1 on Canvas.** Covers Lectures 1 – 4 and Labs 1 & 2. Open 12 n until 11:59:59 pm, US PDT.

Oct 11 (T) **Lecture 5 Discussion. Nutrition & Disease Prevention** (100 WIL). I. Nutrition in the News. II. Standard Serving Sizes: Estimating for Dietary Analyses. III. Nutrients Essential for Life: Water, Energy Nutrients (1^0 Carbohydrates, 2^0 Fats, 3^0 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 1^0 Supplemental Text.* **Assignment: Active Learning Questions Lecture 5.** Submit on Canvas by 11:59:59 pm, US PDT.

Oct 13 (R) **Lecture 6 Discussion. Gastrointestinal System** (100 WIL). 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.

Oct 13 (R) **Lab 3 + Discussion. Nutrition Analyses** (33 KLA). Record your diet for at least one day on p 3-7 and analyze it using the *Diet Controller//Diet Organizer* in Lab and/or *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 3-20* (LM). **Assignment: Lab 3 Worksheet.** Submit on Canvas by 11:59:59 pm, US PDT, by Saturday, October 15th, 2022.

Oct 18 (T) **Lecture 7 Discussion. Cardiovascular System** (100 WIL). 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.

Oct 20 (R) **Lecture 8 Discussion. Atherosclerosis & Cardiovascular Diseases** (100 WIL). 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.

Oct 20 (R) **Lab 4 + Discussion. Heart Rate, Blood Pressure & Cardiovascular Disease Risk** (33 KLA). **Readings:** *pp 4-1 to 4-8* (LM). **Assignment: Lab 4 Worksheet.** Submit on Canvas by 11:59:59 pm, US PDT.

Oct 25 (T) **Lecture 9 Discussion. Blood** (100 WIL). 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 5-6* (LM). **Assignment: Active Learning Questions Lecture 9.** Submit on Canvas by 11:59:59 pm, US PDT.

Oct 27 (R) **Discussion & Review for Quiz 2** (100 WIL). **Activity in Lecture: Jeopardy Game 2**.

Oct 27 (R) **No Lab**! Study for Quiz 2.

Oct 28 (F) **Quiz 2 on Canvas**. Covers Lectures 5 – 8 and Labs 3 & 4. Open 12 n until 11:59:59 pm, US PDT.

Nov 1 (T) **Lecture 10 Discussion. Blood Testing** (100 WIL). 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.

Nov 3 (R)   **Lecture 11 Discussion. Endocrine System** (100 WIL). 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.

Nov 3 (R)   **Lab 5 + Discussion. Blood Chemistry: Blood Glucose & Blood Typing** (33 KLA). **Readings:** *pp 5-1 to 5-6* (LM). **Assignment: Lab 5 Worksheet.** Submit on Canvas by 11:59:59 pm, US PDT.

Nov 8 (T)   **Lecture 12 Discussion. Nervous System** (100 WIL). 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. **Activity:** Jeopardy Game 3. **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 PST. Note time change from US PDT to PST on Nov 6th!

Nov 10 (R)   **Discussion & Review for Quiz 3** (100 WIL). **Activity in Lecture: Jeopardy Game 3**.

Nov 10 (R)   **No Lab**! Study for Quiz 3!

Nov 11 (F)   **Quiz 3 on Canvas**. Covers Lectures 9 – 12 and Lab 5. Open 12 n until 11:59:59 pm, US PST.

Nov 15 (T)   **Lecture 13 Discussion. Skeletal Muscle Structure & Function** (100 WIL). 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 PST.

Nov 17 (R)   **Lecture 14 Discussion. Respiratory System** (100 WIL). 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 PST.

Nov 17 (R)   **Lab 6 + Discussion: Pulmonary Function Tests** (likely by way of Zoom, but subject to change based on Centers for Disease Control & Prevention, State of Oregon & U of O updates). **Readings:** *pp 6-1 to 6-8* (LM). **Assignment: Lab 6 Worksheet.** Submit on Canvas by 11:59:59 pm, US PST.

Nov 22 (T)   **Lecture 15 Discussion. Cigarette Smoking & Vaping** (100 WIL). **Readings & Videos:** *https://www.lung.org/quit-smoking/smoking-facts/health-effects*, *https://www.cancer.org/cancer/cancer-causes/tobacco-and-cancer.html*, *https://smokefree.gov/quit-smoking/why-you-should-quit/health-effects*, *https://www.cdc.gov/tobacco/campaign/tips/quit-smoking/index.html*, *https://www.pbs.org/video/vaping-1576094392/*; *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.

Nov 24 (R)   **No Lecture or Lab**! Happy Thanksgiving! :)

Nov 29 (T)   **Activity in Lecture: Jeopardy Game 4.**

Dec 1 (R)   **Discussion & Review for Quiz 4 in Lecture**.

Dec 1 (R)   **No Lab**! Study for Quiz 4.

Dec 2 (F)   **Quiz 4 on Canvas**. Covers Lectures 13 – 15 and Lab 6. Open 12 n until 11:59:59 pm, US PST.

      Grading: 10% Lecture Attendance & Active Learning Questions submitted on Canvas
                  10% Lab Attendance & Worksheets submitted on Canvas
                  80% 4 Quizzes on Canvas each worth 20%

☺ ...We ♥ Human Physiology!!!