

University of Oregon
Department of Biology

Course: BI 358 Investigations in Medical Physiology, CRN 20794, 04 cr, Lecture: 8:30-9:50 TR, 110 WIL + Discussion-Lab: CRN 20795, 10:00-11:50 T or CRN 20796, 12:00-13:50 T or CRN 20797, 14:00-15:50 T, 13 KLA or Remote Zoom (see specific Discussion-Lab & dates + subject to change based on U of O campus restrictions), Winter 2023.

Canvas Website: <https://canvas.uoregon.edu/courses/212090>

Instructor: V. Pat Lombardi, 65A KLA, 541-346-4536, U of O MS Teams, lombardi@uoregon.edu

Office Hr: M, 11 am – 12 n by Zoom, R 10 – 11 am by Zoom + by appointment.

Discussion-Lab Coordinators, Office Hr, E-Mail: Carla Campos, R 1 – 2 pm, ccampos2@uoregon.edu
Dom Granville, W 8:30 – 9:30 am, dgranvil@uoregon.edu
Rocky Penick, M 12 n – 1 pm, rpenick@uoregon.edu
Avika Sharma, W 12:30 – 1:35 pm, avikas@uoregon.edu

Lab Preparator, E-mail: Katie Perez, kperez@uoregon.edu

Texts: John E. Hall & Michael E. Hall (G&H). *Guyton & Hall Textbook of Medical Physiology*, 14th ed. Elsevier, 2021. [Required] Digital version included. Digital-only version available.

V. Pat Lombardi, Eugene Evonuk & Mary Ann Carmack. *BI 358, Investigations in Medical Physiology Discussion-Lecture Notebook (DLN)*, 2023. [Required] Available weekly online, free on Canvas website.

John E. Hall & Michael E. Hall. *Pocket Companion to Guyton & Hall Textbook of Medical Physiology*, 14th ed. Elsevier Saunders, 2021. [Optional]

Lauralee Sherwood (LS1). *Human Physiology: From Cells to Systems*, 9th/8th/7th/6th ed. Cengage Learning, 2016, 2013, 2010, 2007. [Optional/Supplemental reading.]

Lauralee Sherwood (LS2). *Fundamentals of Physiology: A Human Perspective*, 4th/3rd ed. Brooks/Cole, Cengage Learning, 2012, 2006. [Optional/Supplemental reading.]

Frances S Sizer & Eleanor N. Whitney (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>

Tentative Outline:

Jan 10 (T) **Lecture 1:** Anatomy vs. Physiology, Body Levels of Organization, Homeostatic Balances (Water, Temperature, pH, Ionic, Gas, Metabolic), Simplified Homeostatic Model, Negative (-) vs. Positive (+) Feedback, Feedback Gain. **Readings:** G&H Preface pp vii-viii, ch 1 pp 3-11, ch 46 fig 46-4 p 572; LS1/LS2 ch 1 (Homeostasis); DLN pp A-1, A-2. **Assignment:** Active Learning Questions Lecture 1. Submit on Canvas by 11:59:59 pm, US PST.

Jan 10 (T) **Discussion 1:** I. Introduction & Resources: Personal Information Cards. II. Guidelines for Research Paper & Presentation. **Discussion 2:** Addiction Medicine Primer: I. Discussion: *Opioid Addiction*. II. Breakout Groups & Mini-Presentations on Common Drugs of Addiction: Alcohol, Cocaine, Heroin, Kratom, Marijuana/Cannabis, Methamphetamine, Opioids, Tobacco, E-Cigarettes. **Readings:** DLN pp iv-x, 1-1, 1-2, 2-1 thru 2-74. **Assignments:** Submit Personal Information Card on Canvas by 11:59:59 pm. Begin personal computer search (*PubMed* +) on topic/s of interest. Submit title and rough paper outline on Canvas by 5:00 pm on Jan 16 (M).

- Jan 12 (R) **Lecture 2:** Synapses & Introduction to Addiction Medicine, Autonomic Nervous System: Sympathetic vs. Parasympathetic: Neurotransmitters, Receptors, Actions; Fight-or-Flight. Limbic System & Hypothalamus. **Readings:** G&H ch 46 pp 569-83; ch 59 pp 741-52; ch 61 pp 763-75. **Assignment:** Active Learning Questions Lecture 2. Submit on Canvas by 11:59:59 pm, US PST.
- Jan 16 (M) **Assignments:** Topic title with simple outline in .docx or .doc format due. Submit on Canvas by 5:00 pm, US PST.
- Jan 17 (T) **Lecture 3: Guest Lecture Series-Clinical:** Eric Geisler, MD, Director of Medical Services, Serenity Lane Treatment Center for the Chemically-Dependent, Eugene, OR. *The Disease of Addiction & Case Studies in Addiction Medicine.* **Readings:** DLN pp B-1 - B-9 + <http://learn.genetics.utah.edu/content/addiction/mouse/>. **Assignments:** Active Learning Questions Lecture 3 + Comments on Guest Lecturer. Submit on Canvas by 11:59:59 pm, US PST.
- Jan 17 (T) **Discussion 3:** Peer Review of Outlines. Brief topic explanations within breakout groups. Peer review of outlines + feedback by e-mail. **Readings:** DLN pp 3-1, 3-2. **Assignments:** E-mail outlines in .docx or .doc format to all members in your topic group. Provide e-mail feedback to all group members within 48-hr and submit on Canvas by Jan 19th (R) by 11:59:59 pm, US PST.
- Jan 19 (R) **Lecture 4:** Gastrointestinal Anatomy & Physiology. **Readings:** G&H ch 63, 64 & 65, pp 787-822. **Assignment:** Active Learning Questions Lecture 4. Submit on Canvas by 11:59:59 pm, US PST.
- Jan 20 (F) **Quiz 1**-covers **Lectures 1, 2, 3 & Discussion 2.** Available on Canvas 12 n – 11:59:59 pm, US PST.
- Jan 24 (T) **Lecture 5:** I. Digestion & Absorption. II. Nutrition & Disease Prevention. **Readings:** G&H ch 66 pp 823-32; + highlights of ch 72 pp 877-92; DLN pp C-1 thru C-10. **Assignment:** Active Learning Questions Lecture 5. Submit on Canvas by 11:59:59 pm, US PST.
- Jan 24 (T) **Discussion-Lab 4: Nutrition & Disease Prevention.** **NB:** Prior to lab, please record your diet for at least two full days so that you can analyze it using the *Diet Controller//Diet Organizer or ASA 24 National Cancer Institute Calorie Counter & Food Diary/Cronometer Nutrition Tracker, HealthyOut, My Fitness Pal or Other Smart Phone Software.* **Readings:** DLN pp 4-1 thru 4-22 + see websites on the p 1 of this outline. **Assignment:** Discussion 4 Worksheet with nutrition report attachments. Submit on Canvas by Jan 29th (Sun), 11:59:59 pm, US PST.
- Jan 26 (R) **Lecture 6:** Blood + Immunology I & II: Blood Cells & Immunity, Overview of Innate vs. Acquired/Adaptive (Nonspecific vs. Specific) Immunity. Resistance of the Body to Infection; Immunity & Allergy. Evolution of the Immune System, How Breast Milk Protects Newborns. **Readings:** G&H ch 33, 34 & 35 pp 439-70; ch 36 pp 471-6 + posted article links. **Assignment:** Active Learning Questions Lecture 6. Submit on Canvas by 11:59:59 pm, US PST.
- Jan 27 (F) **Quiz 2**-covers **Lectures 4, 5 & Discussion 4.** Available on Canvas 12 n – 11:59:59 pm, US PST.
- Jan 31 (T) **Lecture 7: Guest Lecture Series-Clinical:** Kraig W. Jacobson, MD, Oregon Allergy Associates, Eugene, OR. *Allergy & Immunology.* **Readings:** DLN pp D-1 thru D-14. **Assignments:** Active Learning Questions Lecture 7 + Comments on Guest Lecturer. Submit on Canvas by 11:59:59 pm, US PST.
- Jan 31 (T) **Discussion-Lab 5:** I. Evolution, Immunity & the Invertebrates. Sharks & Origins of Vertebrate Immunity. Allergies? II. White Blood Cell Differential Count Lab. **Readings:** DLN pp 5-1 thru 5-9 + article links posted on Canvas. **Assignment:** Lab 5 Blood Chemistry Worksheet. Submit on Canvas by Feb 5th (Sun), 11:59:59 pm, US PST.

- Feb 2 (R) **Lecture 8:** Cardiovascular Physiology: Heart & Vessels Anatomy & Physiology, General Circulation, Coronary Circulation, Heart Sounds, Atherosclerosis, CABG & PTCA, Hypertension. **Readings:** G&H ch 9 pp 113-21; ch 14 pp 171-4; ch 15 pp 186-92; ch 16 pp 193-7, 201-4; ch 21 pp 262-9; ch 23 pp 283-8; ch 69 pp 861-4. **Assignment:** Active Learning Questions Lecture 8. Submit on Canvas by 11:59:59 pm, US PST.
- Feb 7 (T) **Lecture 9: Guest Lecture Series-Clinical:** Richard C. Padgett, MD, Cardiology, Oregon Heart & Vascular Institute, Eugene, OR. *Clinical Cardiology, Case Studies & Recent Advances*. **Readings:** DLN pp E-1 thru E-8. **Assignments:** Active Learning Questions Lecture 9 + Comments on Guest Lecturer. Submit on Canvas by 11:59:59 pm, US PST.
- Feb 7 (T) **Discussion-Lab 6:** Heart Model Anatomy & Heart Dissection Lab. Blood Pressure, Hypertension & International & National Guidelines. **Readings:** DLN p 6-1 and 6-2; G&H pp 173-8, 234, 863.
- Feb 9 (R) **Lecture 10:** I. Introduction to Endocrinology, Pituitary Hormones & Control by the Hypothalamus. II. Peripheral Endocrine Organs. **Readings:** G&H ch 75 & 76 pp 915-40; ch 77 & 78 highlights pp 941-72. **Assignment:** Active Learning Questions Lecture 10. Submit on Canvas by 11:59:59 pm, US PST.
- Feb 10 (F) **Quiz 3** – Covers **Lectures 6, 7, 8, 9 & Discussions-Labs 5 & 6** (Blood, Immunology, Cardiovascular Physiology & Cardiology). Available on Canvas 12 n – 11:59:59 pm, US PST.
- Feb 13 (M) **Assignments:** Group I Presenters submit Paper Draft on Canvas in .docx or .doc format and by e-mail to group members by 5 pm, US PST.
- Feb 14 (T) **Lecture 11:** Reproductive Physiology: I. Female Reproductive Anatomy & Physiology: Ovarian & Menstrual Cycle, Birth Control Techniques. II. Male Reproductive Anatomy & Physiology. **Readings:** G&H ch 82 pp 1027-44; ch 83 pp 1045-51; highlights of ch 81 pp 1011-25. **Assignment:** Active Learning Questions Lecture 11. Submit on Canvas by 11:59:59 pm, US PST.
- Feb 14 (T) **Discussion 7:** Peer Review of Group I Papers, updates on others. **Readings:** DLN pp 7-1 thru 7-3. **Assignment:** Case histories to prepare for Dr. Garrett. Submit on Canvas by 11:59:59 pm, US PST.
- Feb 16 (R) **Lecture 12: Guest Lecture Series-Clinical:** Audrey P. Garrett, MD, MPH, Willamette Valley Cancer Institute & Research Center, Eugene, OR & Oregon Health & Science University, Portland, OR. *Human Papillomavirus (HPV), Cancer & Gynecologic Care*. **Readings:** DLN pp F-1 thru F-16. **Assignments:** Active Learning Questions Lecture 12 + Comments on Guest Lecturer. Submit on Canvas by 11:59:59 pm, US PST.
- Feb 20 (M) **Assignments:** Presentations Group I due on Canvas in .pdf format and to lombardi@uoregon.edu in .pptx or .ppt format by 5 pm, US PST. Group II Presenters submit Paper Draft on Canvas in .docx or .doc format and by e-mail to group members by 5 pm, US PST.
- Feb 21 (T) **Lecture 13: Guest Lecture Series-Clinical:** Paul F. Kaplan, MD, Oregon Health & Science University, Portland, OR & University Health Center & Department of Human Physiology, Eugene, OR. *Assisted Reproductive Technologies (ART) & Polycystic Ovary Disease: A Common Endocrine Disorder in Women*. **Readings:** DLN pp G-1 thru G-10. **Assignments:** Active Learning Questions Lecture 13 + Comments on Guest Lecturer. Submit on Canvas by 11:59:59 pm, US PST.
- Feb 21 (T) **Discussion 8: Class Presentations I.**
- Feb 23 (R) **Lecture 14:** Fetal & Neonatal Physiology, Fetal Blood Flow, Pediatrics, Children & Bone Development. **Readings:** G&H ch 84 pp 1061-70; ch 23 pp 288-91; ch 80 pp 993-9. **Assignment:** Active Learning Questions Lecture 14. Submit on Canvas by 11:59:59 pm, US PST.
- Feb 24 (F) **Quiz 4** – covers **Lectures 10, 11, 12, 13 & Discussion 7 Case Histories** (Endocrinology, Reproduction, HPV & Cancer). Available on Canvas 12 n – 11:59:59 pm, US PST.

- Feb 27 (M) **Assignments:** Presentations Group II due on Canvas in *.pdf* format and to lombardi@uoregon.edu in *.pptx* or *.ppt* format by 5 pm, US PST. Group III Presenters submit Paper Draft on Canvas in *.docx* or *.doc* format and by e-mail to group members by 5 pm, US PST.
- Feb 28 (T) **Lecture 15: Guest Lecture Series-Clinical:** Pilar Bradshaw, MD, Eugene Pediatric Associates, Eugene, OR. *Pediatrics & Case Studies*. **Readings:** DLN pp H-1 thru H-4. **Assignments:** Active Learning Questions Lecture 15 + Comments on Guest Lecturer. Submit on Canvas by 11:59:59 pm, US PST.
- Feb 28 (T) **Discussion 9: Class Presentations II.**
- Mar 2 (R) **Lecture 16:** No formal lecture. Work on research papers.
- Mar 6 (M) **Assignments:** Presentations Group III due on Canvas and to lombardi@uoregon.edu by 5 pm, US PST.
- Mar 7 (T) **Lecture 17: Guest Lecture Series - Clinical:** Jenna M. Godfrey, MD, MSPH, Slocum Center for Orthopedics & Sports Medicine, Eugene, OR. *Congenital Hand Differences in the Media*. **Readings:** DLN pp H-5 thru H-12. **Assignments:** Active Learning Questions Lecture 17 + Comments on Guest Lecturer. Submit on Canvas by 11:59:59 pm, US PST.
- Mar 7 (T) **Discussion 10: Class Presentations III.**
- Mar 9 (R) **Lecture 18:** Eye Anatomy & Physiology. I: Anatomy & Optics of Vision. II: Retinal Receptor & Neural Function. III: Central Neurophysiology of Vision. **Readings:** G&H ch 50, 51 pp 627-51; ch 52 pp 653-6. **Assignment:** Active Learning Questions Lecture 18. Submit on Canvas by 11:59:59 pm, US PST.
- Mar 10 (F) **Quiz 5** –covers **Lectures 14, 15 & 17** (Fetal Physiology & Development, Pediatrics & Orthopedics). Available on Canvas 12 n – 11:59:59 pm.
- Mar 14 (T) **Lecture 19: Guest Lecture Series-Clinical:** Annette Chang Sims, MD, Oregon Eye Specialists, Drs. Fine, Hoffman & Sims, Ophthalmologists, Eugene, Springfield & Florence, OR. *Ophthalmology: The Medical & Surgical Treatment of Eye Diseases*. **Readings:** I-1 thru I-6. **Assignments:** Active Learning Questions Lecture 19 + Comments on Guest Lecturer. Submit on Canvas by 11:59:59 pm, US PST.
- Mar 14 (T) **Discussion-Lab 11: Vision Lab with Eye Dissections. Readings:** DLN pp 11-1 thru 11-3.
- Mar 16 (R) **Lecture 20:** Thoughts on applying to graduate schools in medicine & allied health. Final comments by Pat.
- Mar 17 (F) **Quiz 6** -covers **Lectures 18, 19 & Discussion-Lab 11**. Available on Canvas 12 n – 11:59:59 pm, US PST.
- Mar 20 (M) **Final Research Paper Due by 5:00 pm, US PDT. Assignment:** Submit *.docx* or *.doc* format on Canvas by 5:00 pm.

Grading:

- Attendance & Participation (25%)
- Feedback on Guest Lecturers & Peers (5%)
- Paper & Presentation (10%)
- Quizzes (60%)

BI 358 Investigations in Medical Physiology Syllabus
University of Oregon, Department of Biology
V. Pat Lombardi

Introduction: *BI 358 Investigations in Medical Physiology* is an upper division lecture, discussion/laboratory course that is ideal for seniors and juniors with aspirations for careers in medicine. It is designed to bridge the gap between textbook knowledge from Guyton & Hall *Textbook of Medical Physiology* and practical applications in clinical medicine and research. Basic and applied physiology lectures are followed by presentations by experts in medicine and research. The primary approaches we will use to explore medical physiology are descriptive (what and where), correlational (relationship between two or more variables) and mechanistic (how, sequence of cause-and-effect steps). Occasionally, we will use a purpose-driven (why or teleological) approach to help us remember or associate key concepts. Topic coverage includes homeostasis and homeostatic models; the nervous system, neurotransmitters and addiction medicine; immunology, allergies and asthma; cardiovascular physiology and clinical cardiology; digestive physiology and nutrition; endocrinology, reproductive physiology and infertility; gynecologic oncology; neonatology and development, pediatrics and pediatric orthopedics; and visual physiology and clinical ophthalmology.

Physiology, the study or science of function in living matter, is a wonderfully broad and demanding field that encompass many disciplines including anatomy, animal physiology, biochemistry, cell biology, environmental and exercise physiology, histology, immunology, mathematics, medicine, molecular biology, nutrition, pathophysiology (the study of diseases), physics, and systems physiology! The specific focus of study varies based on the adjective placed 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 to unique modes of exercise, primarily in humans. *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. *Medical* physiology focuses on the study of function with specific applications to medicine. Certainly, there is much overlap among subdisciplines. Though we will discuss examples from many areas of medical physiology, our primary focus will be to study humans at a variety of levels of organization – 1st under normal and healthy baseline conditions prior to examining pathology, that is, how diseases disrupt homeostatic balances. Whatever your plans in medicine or allied health, ultimately, my hope is that you enhance your appreciation and understanding of the intricate and miraculous nature of the human body and that you apply what you have learned in this course throughout the rest of your life!

Prerequisites & Applications: The prerequisites for BI 358 are General Biology IV: *BI 214 Mechanisms* or Honors Biology III: *BI 283H Evolution, Diversity & Ecology* or *HPHY 324 Human Physiology II*. These prerequisites imply that you have completed a lower division Biology sequence required for the Biology, Human Physiology or General Science major. A background in Human Anatomy & Physiology is preferred because this will ensure that previously you have studied at the descriptive level (what and where) and have established the vocabulary of the

structures needed to study specific functions. BI 358 is an *Area II Systems/Organisms* course and can be applied toward the 44-cr of upper division courses required for the Biology major and may be applied toward the 16-cr of upper division electives required for the Human Physiology major.

Learning outcomes: By the end of the course, you should be able to:

- construct homeostatic models to solve problems at multiple levels of organization in applied physiology, medicine and research and demonstrate this ability on weekly quizzes.
- engage in peer-review of outlines, paper drafts and presentations, and provide feedback on guest speakers.
- examine, analyze and summarize research in a personal area of interest in medical physiology.
- develop and formalize an outline, review paper and class presentation and assist in grading these with instructors and peers.
- enhance scientific writing and presentation skills based on extensive evaluation and instructor and peer feedback.

Learning Objectives: By the end of the course, you should be able to:

- 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 concept of feedback gain and provide examples of negative and positive feedback.
- identify the specific components of a simplified homeostatic model that are disrupted in common human pathologies like cardiovascular diseases and diabetes mellitus.
- compare and contrast parasympathetic and sympathetic neurotransmitters, receptors, actions, and rest-and-digest vs. fight-or-flight states.
- discuss how common drugs of addiction impact primary neurotransmitters, synapses, body organs and systems.
- describe the physiology and inherent multi-organ risks of cigarette smoking and vaping.
- identify structures and functions of the gastrointestinal system and describe steps involved in digestion and absorption.
- describe the role nutrition plays in disease prevention and compare and contrast plant- vs. animal-based diets.
- identify the common characteristics of the world's longest-lived people in *Blue Zones*.
- describe the relationship of trimethyl amine oxide (TMAO) and N-glycolylneuraminic acid (neu5Gc) in the development of inflammation and chronic human diseases.
- analyze the nutrient content of your personal diet relative to national guidelines and make recommendations for self-improvement.
- identify components of blood and the function of red blood cells, white blood cells and platelets; compare and contrast plasma vs. serum.
- define and calculate hematocrit, evaluate blood glucose and classify normal and abnormal ranges.

- describe the steps involved in a white blood cell differential count and identify the general structure, function and % of individual white blood cells.
- compare and contrast innate vs. adaptive immunity.
- provide an overview of clinical immunology and treatments involved in allergies.
- identify components of the cardiovascular and lymphatic systems and describe fluid flow and structural and functional relationships between these systems.
- illustrate the coronary circulation, describe phases of the cardiac cycle and normal and abnormal heart sounds.
- define blood pressure, hypertension and new national and international guidelines for assessment.
- explain theories involved in the development of atherosclerosis, general atherosclerotic risk factors, the treatment triad and guidelines for prevention.
- discuss the cardiology surgical procedures percutaneous transluminal coronary angioplasty (PTCA) and transaortic valve replacement (TAVR).
- identify the structure and function of organs in the endocrine system
- illustrate the vascular connection between the hypothalamus and anterior pituitary and the nervous connection between the hypothalamus and posterior pituitary.
- identify hypothalamic release- and release-inhibiting hormones and anterior pituitary hormones together with normal and abnormal feedback mechanisms.
- describe female and male reproductive anatomy and physiology along with hormonal feedback mechanisms.
- define reproduction number R_0 , discuss the spike protein and mRNA vaccines and implications relative to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).
- explain the relationship between human papilloma viruses (HPV) and cancer development.
- discuss assisted reproductive technologies (ART) and the identification and treatment of couples with infertility.
- describe the features of polycystic ovary disease.
- explain basic fetal and neonatal physiology, fetal blood flow, vital signs and development.
- identify common pediatric diseases and a general systems plan for diagnoses and treatments.
- classify congenital hand differences and potential orthopedic treatments.
- describe the structure and function of the eye and the general physics of myopia, hyperopia and presbyopia.
- discuss cataracts and glaucoma and ophthalmology treatments including phacoemulsification and shunt surgeries used to reduce intra-ocular pressure.

Canvas Site:

The Canvas link for our course is <https://canvas.uoregon.edu/courses/212090>. 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 Discussions, and any Lab Worksheets for the following week at least by the preceding Saturday on Canvas.

Lecture Texts & References:

John E Hall & Michael E Hall (G&H). *Guyton & Hall Textbook of Medical Physiology, 14th ed.* Elsevier, 2021. [Required] Digital version included. Digital-only version available.

Lab Discussion Notebook & References:

V. Pat Lombardi, Eugene Evonuk & Mary Ann Carmack (DLN). *BI 358, Investigations in Medical Physiology, Discussion/Laboratory-Lecture Notebook, Winter 2023*. Provided free on Canvas.

The *Discussion/Laboratory-Lecture Notebook* contains all of the background for discussions and labs and slides from prior guest lectures. It is usually for sale at the U of O Duck Store (Bookstore) for ~10 US dollars, but for this term, it is free because I am posting this for you directly on Canvas.

Additional Lecture & Lab Resources:

Lauralee Sherwood (LS1). *Fundamentals of Human Physiology, 4th ed.* Belmont, CA: Brooks/Cole, Cengage Learning, 2012, ISBN-13:0840062253. Digital rental or purchase, used or new textbook.

Lauralee Sherwood (LS2). *Fundamentals of Physiology: A Human Perspective, 4th/3rd ed.* Brooks/Cole, Cengage Learning, 2012, 2006. [Optional/Supplemental reading.]

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.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>

Requirements:

- **Review the Active Learning Questions and Lecture .pdfs prior to attending live and in-person, Lectures.** The .pdfs will be posted on Canvas by the weekend prior to lectures. Our live and in-person lectures are scheduled for 1 hr and 20 min. So that we can engage at least partly in a reverse classroom configuration, it is crucial that you review Active Learning Questions and .pdfs before attending lectures. The answers to the Active Learning Questions are mostly within the .pdfs, Guyton & Hall *Textbook of Medical Physiology* and other course materials.
- **Complete Active Learning Questions** using the .docx template provided and submit by way of Canvas by 11:59:59 pm the night of each Lecture. To make it easier for the reviewer to make comments, .docx or .doc format is preferred. Hand-written, .jpg and .pages documents will not be accepted. Be sure to rely on our course materials 1st before searching the internet reflexively. If you do search the internet as a follow-up, rely upon more accurate and reliable sites with .edu, .org or .gov extensions. It's probably best not to submit Active Learning Questions until after you have attended the lecture.

- **Review the Discussion/Lab Background material and .pdfs and any Lab Worksheets posted on Canvas prior to attending live and in-person Lab Discussions.** Our live, in-person discussions/labs are scheduled for 1 hr and 50 min. Again, so that we can take at least partial advantage of a reverse classroom design, it is crucial that you review at least background material and .pdfs prior to coming to our Lab Discussions. The Nutrition Lab involves the most analyses and question responses while the Blood Chemistry Lab requires a moderately extensive write-up with guidelines posted for both labs on Canvas. Again, as with the lecture, seek course materials 1st prior to conducting internet searches reflexively.
- **Complete Lab Reports** using the template provided for required labs and submit by way of Canvas by 11:59:59 pm as indicated on the course outline. For the Nutrition and Blood Chemistry Labs you will have until the weekend to submit, due to the more extensive nature of these write-ups.
- **Provide Feedback on Guest Lectures** using the template provided and submit by way of Canvas by 11:59:59 pm on the same day as the guest lecture. To make it easier to collate for guests, please use .docx/.doc, single-paragraph format, and do not identify yourself.
- **Provide Feedback on Outlines & Paper Drafts for Peers** within your assigned presentation group. Post these on Canvas by the deadline listed within the Course Outline on Canvas.
- **Create a Research Paper** of 6 double-spaced pages with 1 page of references (so a total of 7 pages) using distinct headers (Introduction...Directions for Future Research, Summary & Conclusions, References) and a variable-by-variable approach. Submit your research paper in .docx or .doc format on Canvas by Monday at 5:00 pm during final exam week. More details will be posted on Canvas under *Paper and Presentation Guidelines* and described in your Lab Discussion section.
- **Create a Presentation** of 5-7 slides maximum (.pptx) on a medical physiology research topic of your choice and submit .pdf on Canvas by Monday at 5:00 pm on the night before your scheduled presentation. Also, submit by way of e-mail a .pptx or .pdf (depending on the software you use) to lombardi@uoregon.edu by Monday at 5:00 pm on the night before your scheduled presentation. More details about the presentation are posted on Canvas under [Paper and Presentation Guidelines](#) and described during your Lab Discussion section.
- **Provide Comments & Score** all presentations except for your own by using a score sheet and scale provided during each of the three Discussion presentation dates. More details about the scoring will be posted on Canvas and described during your Lab Discussion section.
- Complete six online **Canvas Quizzes** covering all Active Learning Q, Lectures, Discussions/Labs for the specific modules indicated on the *Course Outline*. Each Quiz will contain 10 Q (multi-modal, multiple choice...) and have a 20- to 30-min window to complete, sometime between 12 N and 11:59:59 pm US PDT on Fridays.

Accessible Education: If you have documented additional needs through our Accessible Education Center (AEC) <https://aec.uoregon.edu/using-aec-connect>, more time will be allotted for you to complete quizzes.

Quiz Directions: The Canvas quizzes on Fridays 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 shots or snipping tools to capture quiz questions. You will pledge to ensure 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 other materials, 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 20 (or perhaps 30) minutes to complete it, unless you have received additional time for AEC accommodations. Best of luck!

Assignment Submission Details:

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. 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 ~ 70 submissions x 5 questions each (so ≥ 350 questions per assignment) and the time required, especially when we make comments, is extraordinary. Thank you sincerely for adhering to all the above requirements. Doing so will ensure that you do your very best and at the same time help us with grading!

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. Online Canvas Quizzes are scheduled for Fridays and have an extended ~ 12-hr window for completing, from 12 n until 11:59:59 pm. We are extremely reluctant to make-up any quizzes, as that requires developing alternative questions, delays the posting of answers scheduled for the following Monday and thus impacts all others in the class.

Grading:

The grading for the course is as follows:

25% Attendance & Participation

5% Feedback on Guest Lecturers & Peers

10% Paper (5%) & Presentation (5%)

60% Quizzes (10% for each of the 6 Quizzes)

100% Total

You cannot choose to opt out of any of the above requirements or grading. It is important that everyone participate in all parts of the course. The grading breakdown is below and detailed directions are provided on Canvas and discussed in lecture & lab.

BI 358 2021e Grading			
Assignment	#	Pt value ea	Total
Introduction Card	1	0.25	0.25
Active Learning Q-Lecture	18	0.5	9
Attendance-Lecture	19	0.5	9.5
Attendance-Lab	10	0.5	5
Blood Chemistry Write-up	1	0.25	0.25
Case Histories	1	0.25	0.25
Feedback-Guest Lecturers	8	0.5	4
Feedback-Peers	2	0.5	1
Nutritional Analyses	1	0.5	0.5
Outline	1	0.25	0.25
Paper	1	5	5
Presentation	1	5	5
Quizzes	6	10	60
		$\Sigma =$	100

24.25

5 Feedback

0.75

10 Paper & Presentation

60 Quizzes

25 Attendance & Participation

100 Total

Please let us know if you have any questions or need additional information or resources. We are looking forward to learning together and having fun this term! :)