

 <p>Emphasizing: Connections</p>	<p style="text-align: center;">BIOL 4241 LABORATORY FOR Physiology UNIVERSITY OF HOUSTON – CLEAR LAKE</p>
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Instructor: Stephen Gruber Email: gruber@uhcl.edu Office Hrs: T/Th 1-3PM

Applied Critical Thinking Statement:

This course has been authorized by UHCL as an Applied Critical Thinking (ACT) Course which means that in addition to learning about the specified course content, students will be engaged with some or all of the Elements of Thought and Universal Intellectual Standards of critical thinking. The objective of an ACT course is to develop the student's ability to become skilled at analysis and evaluation by applying a set of intellectual tools that may be effectively used across all disciplines (as well as to the student's personal life). Based on the Foundation for Critical Thinking model (<http://www.criticalthinking.org/>), critical thinking involves thinking for a *purpose*, asking *questions*, using *information*, applying *concepts*, drawing *inferences and conclusions*, identifying *assumptions*, anticipating *implications and consequences*, and recognizing *points of view*. The Universal Intellectual Standards that are applied to these Elements of Thought of critical thinking in order to develop Intellectual Traits include *clarity, accuracy, precision, relevance, depth, breadth, logic, significance, and fairness*.

General Course Information

Prerequisites/Co-requisites: Human Physiology or Comparative Animal Physiology

Introduction

This course provides a hands on approach to understanding the physiological mechanisms that maintain homeostasis in the human body. It provides students with the opportunity to collect real time data and make inferences about the regulatory mechanisms for each physiological system. By understanding the negative feedback mechanisms that control human physiology students gain a better understanding of human health and disease.

The material covered will be presented in a laboratory exercise format. All materials will be covered during the lab time. However, you will be required to read the lab information for the upcoming lab. Handouts of figures, tables, and charts will be provided via Black Board or printed during the prior lab period.

Lab attendance is mandatory. The beginning of each lab will include a quiz over the concepts to be covered in that day's lab; the quiz cannot be made up if missed. **YOU WILL BE EXPECTED TO DO THE ASSIGNED READINGS AND ANY MATERIAL FROM THESE READINGS IS FAIR GAME FOR QUIZ QUESTIONS.**

Participation during the lab is expected. Everyone should expect to serve as a subject for the lab exercises.. Missing a lab hurts your team! REGARDLESS OF THE REASON, YOU WILL LOSE 5 PARTICIPATION POINTS FOR EVERY MISSED LAB. Class participation will be worth a total of **55 points**

As a courtesy to the class, all cellphones should be set to “silent mode” or preferably turned off during lab. Responses to cellphones should be restricted to emergencies. If you must respond to a phone call during lab, please leave the room as quietly as possible before answering your phone.

Critical Thinking and Physiology

The ability to interpret physiological data requires critical thinking. The collection of raw data alone does not explain physiological mechanisms. Only through data analysis and making inferences based on collected data can it be correctly interpreted in terms of a mechanism of control. Furthermore, our basic understanding of physiology is based on average values for a population (98.6°F body temp) and not on the specific values for an individual. Students will have to apply critical thinking skills to determine the values they collect in lab vary from the accepted average because of differences in the individual or possible physiological stresses that are occurring at the time the data is collected. The student’s ability to articulate their insight and interpret data depends on their ability to think critically and, through the use of critical thinking, communicate their findings effectively. As students transfer from classroom environments into their careers, being able to critically analyze physiological conditions will improve their ability to make wise choices when it comes to their personal and families health.

Student Learning Objectives (SLO) for Human Physiology Lab:

1. Use **logic** to decipher the **breadth** of physiological processes through the **interpretation** of data collected weekly in lab.
2. Investigate **significant and relevant** information pertaining to negative feedback mechanisms and their role in homeostasis.
3. Be able to **clearly and accurately** discuss core physiological **concepts** and explain how lab data applies to those concepts.
4. Be able to work cooperatively and **fairly** as part of a team to collect data and understand the **implications** of that data.

Central Questions

1. What is homeostasis and how do negative feedback mechanism influence it?
2. How do stresses applied to the body affect these mechanisms?

Central questions represent the purpose of the course. All knowledge in a course is organized to answer the central questions. As you read, collect data, and discuss the assignments of this course, it should always be done in the context of answering one or both of the central questions.

Fundamental Concepts

1. Homeostasis is the body’s ability to maintain a stable internal environment regardless of stresses applied to it.
2. Negative feedback is a mechanism of control that allows physiological systems to fluctuate around certain set points. Body systems fluctuate around a set point; they are not rigidly fixed at that point.
3. Sensory-motor integration is important in controlling physiology. The body monitors internal and external environments and must determine the correct responses to maintain homeostasis.

The fundamental concepts of a course can be thought of as the foundations of a course. They are the concepts upon which all other ideas are constructed and arranged. If you understand these concepts in a deep, personal, and meaningful way, you will find it much easier to grasp other concepts covered

in this course. Ultimately, a thorough understanding of the fundamental concepts of a course should help you address, in a meaningful way, the central questions of a course.

Whenever you come across a new idea, new readings, or new assignments related to this course ask yourself, “which fundamental concepts apply here,” and “how do they inform the central question of the course?” As you develop answers to these two questions, you begin the process of thinking critically about human physiology.

Major Activities Requiring Critical Thinking (Assignments)

Weekly Prelab Quiz: Starting with the second week of class, a weekly quiz worth 5 points will be given at the beginning of each lab. The questions on the quiz will be based on the lab protocol for that week's lab. NO MAKE-UPS will be given for weekly quizzes REGARDLESS OF THE REASON FOR MISSING THE QUIZ. If you come to lab late (after everyone had completed the quiz), or miss a lab, you lose all 5 quiz points for that week. There will be 10 quizzes for a total points possible of **50**

Exams: There will be three exams. Each exam will be based on material covered in the previous labs. With respect to material covered, the exams will be non-cumulative. Exams will be composed of 10-12 vocabulary style questions and 3-6 short answer/essay. The essay style questions will be based on your ability to analyze sample data and relate it to the core concepts from the previous lab activities. Each exam will be worth 50 points; Total exam points possible: **150**. *If you miss an exam, contact the instructor immediately to schedule a make-up exam.*

Sample Rubric for Exam Essay Questions			
Student learning Objective	Insufficient Answer (≤75% of possible points)	Adequate Answer (76%-88% possible points)	Excellent Answer (≥88% possible points)
SLO1: Demonstrate a logical and precise understanding of physiological processes through interpretation of data	Defines the physiological process without going into detail. Ignores sample data provided or misuses the data in the explanation of the process	Correctly defines the physiological process and attempts to apply the sample data to explain the process.	Clearly describes the physiological process and uses sample data in a logical manner to represent the control and regulation of the physiological process.
SLO2: Investigate significant and relevant information pertaining to negative feedback mechanisms and their role in homeostasis	Gives a basic description of the physiological process or the mechanism of control. Does not use specifics from previous labs to further their explanations.	Correctly defines the mechanism of control for a physiological system without giving specifics based on lab experiences.	Clearly defines the mechanisms of physiological control, how it regulates a specific system, and refers to previous lab experiences in order to complete their description.
SLO3: Be able to clearly and accurately discuss core physiological concepts and explain how lab data applies to those concepts.	Gives short and simplified answers ignoring the sample data and graphs provided.	Correctly discusses the core concepts without using the data and graphs provided	Clearly describes the physiological concept, correctly labels graphs, and accurately incorporated sample data in the description of the process.

Question Sets: Each lab will be accompanied by a question set that each student will be required to complete. Questions sets will require you to use critical thinking to analyze and interpret the data you collect in the weekly lab procedures. The question sets will be handed in at the beginning of the

previous week's lab. Unless you make prior arrangements with the instructor, **NO LATE QUESTION SETS WILL BE ACCEPTED.** Each question set will be worth 10 points. Total points possible from question sets: **110**.

Sample Rubric for Question Sets			
Student learning Objective	Insufficient Answer (≤75% of possible points)	Adequate Answer (76%-88% possible points)	Excellent Answer (≥88% possible points)
SLO1: Demonstrate a logical and precise understanding of physiological processes through interpretation of data	Answers question without introducing the physiological concept. Ignores data collected in lab during the discussion	Correctly defines the physiological process. Either correctly introduces the physiological process or applies the data in the explanation of the process.	Clearly introduces and describes the physiological process. Accurately inserts data in order to discuss the control and regulation of the physiological process.

Grades: Final grades will be based on the total points accumulated. **The total possible points for the course is 365.** The letter grade will be determined as a percentage of this total (for example $300/365 = 82\%$). Letter grades will be assigned according to the scale, 90-100=A, 80-89=B, 70-79=C, 60-69=D, and less than 60 =F. I want everyone to get an 'A' in the course, so study hard, ask questions, and good luck! If you feel that you are having trouble with the material, please see the instructor immediately, so that help can be provided. Please, don't wait until the last week of the course to seek help!

Honor Code: Students will be expected to adhere to the UHCL Academic Honesty Policy. This code is detailed in the UHCL catalog. Anyone found in violation of this code will be held accountable for his/her behavior.

Students with Disabilities: If you are certified as disabled and entitled to accommodation under the ADA Act, Section 503, please tell me immediately so that arrangements can be made. If you are not currently certified and think you may qualify, please contact the Health and Disability Services Office.

Drop Date: The last day to drop the course without receiving a grade is **November 13th**. It is your responsibility to initiate the drop proceedings. **If you simply stop attending the course and do not take the exams I will assign you a grade of 'F'.**

6 Drop Rule Limitation: Students who entered college for the first time in Fall 2007 or later should be aware of the course drop limitation imposed by the Texas Legislature (S.B. 1231). Dropping this or any other course between the first day of class and the census date (**10/30**) for the semester/session does not affect your 6 drop rule count. Dropping a course between the census date and the last day to drop a class (**11/13**) for the semester/session will count as one of your 6 permitted drops. You should take this into consideration before dropping this or any other course. Visit www.uhcl.edu/records for more information on the 6 drop rule and the census date information for the semester/session.

Incomplete Grade Requests: The UHCL policy regarding receiving an incomplete grade (i.e. grade of 'I') for a course states that the student must be making "satisfactory progress" in order to receive an incomplete. I interpret this to mean that you must be earning a grade of 'C' or better at the time of the request to receive an incomplete ('I') for the course. **If you are not earning at least a 'C' in the course I will not be able to give you an incomplete.**

Lecture Schedule for Human Physiology Lab

Date (Week of)	Topic
08/28	Homeostasis & Biopac Introduction
09/04	EMG & Muscles (Quiz 1)
09/11	Neuro Lab (Quiz 2)
09/18	EOG (Quiz 3)
09/25	Exam 1
10/02	Intro to ECG (Quiz 4)
10/09	Mechanical Events ECG (Quiz 5)
10/16	Cardiovascular System and Exercise (Quiz 6)
10/23	Exam 2
10/30	Pulmonary Function (Quiz 7)
11/06	Osmolarity and Blood Type (Quiz 8)
11/13	Kidney Function (Quiz 9)
11/20	Thanksgiving Holiday (No Classes)
11/27	Glucose Lab (Quiz 10)
12/04	Exam 3

***NOTE: This schedule is intended as a general guide and may be altered as necessary by the instructor.**