Biology 2040 – Human Physiology

Spring 2021 Syllabus

GENERAL COURSE INFORMATION

Instructor: Dr. Eivers
Instructors Office/lab: La Kretz Hall (LKH392/350)
Email Address: eeivers@calstatela.edu
Lecture Zoom times: M/W: 1:40pm – 2:55pm, **Location:** Online: Zoom
Office Hours: Monday 12-1pm**:** Tuesday 12-1pm by appointment on Zoom

Lecture Zoom Link:
https://calstatela.zoom.us/j/89057603597?pwd=b3FvdjN1RmpLQTFMeGZGVDkybnd2dz09

This link will be used to access lecture every Monday and Wednesday throughout the semester.

Zoom Password: 2040

COURSE DESCRIPTION:
Students will focus on basic physiological mechanisms underlying human life processes. Topics to be covered in this course include, cell biology and communication, neurophysiology, muscle physiology, cardiovascular physiology, hematology, renal physiology, endocrinology and the digestive system.

STUDENT LEARNING OBJECTIVES

1) Content Knowledge - Students will demonstrate thorough knowledge of the functioning of multiple organ systems in performing body functions, with special attention paid to the maintenance of homeostasis.

2) Scientific Method - Students will demonstrate understanding of the principles of experimental design and analysis, including the nature of hypotheses, independent, dependent, and control variables, experimental design, and analysis including basic hypothesis testing.

COURSE OBJECTIVES
Upon successful completion of this course, students will be able to:

- Demonstrate knowledge of the organs and processes involved in the normal functioning of the nervous, endocrine, cardiovascular, muscular, digestive, urinary, and respiratory systems.
- Identify the likely site and nature of disorders in these systems based on presentation of generalized signs and symptoms.
- Describe the interactions between these systems in maintaining homeostasis, both in general and in specific scenarios such as exercise, dehydration, electrolyte imbalance, blood loss, poor respiratory function, and others.
- List and describe a variety environmental inputs to the body, their effects, and how the body compensates for those effects to maintain homeostasis.
- Concisely and accurately convey experimental data in a scientific format.
- Summarize and evaluate experimental data in the writing of a scientific research report.

COURSE WEBSITES: CSULA GET – CANVAS & Pearson Mastering

COURSE TEXTBOOK: If you have a human physiology textbook from a previous semester (McKinley, Marieb etc…) that will work for this physiology class. If not you can purchase (e-text or paper) of Silverthorn 8th edition.
For this class specifically, you will need to purchase a **Pearson Modified Mastering A&P** code to complete the online lab portions.

Where can I get the **Modified Mastering A&P**?

1. If you purchase the Silverthorn textbook from the CSULA bookstore it already comes with the **Modified Mastering A&P** code
2. If you prefer you can purchase only the **Modified Mastering A&P** code directly from the Pearson website (cheapest if you don't need to purchase a textbook) ($64.99)
3. Or you can purchase the **Silverthorn e-text with Modified Mastering A&P** from Pearson's website ($94.99)

ATTENDANCE AND BEHAVIOUR

Review of recorded lecture is expected and very important to the overall progress you can achieve in this course. You are responsible for your education and so it is in your best interest to be present in online and be an active participant. Ask questions when unsure, attend Zoom lectures, if you are unable to attend live lectures, recorded lectures will be posted on Canvas within 24 hours of class completion. Be aware of exam dates and deadlines for quizzes and activities.

MAKE-UP EXAMS

No makeup exams will be given, exception will **ONLY** be permitted with documentation (such as a physician's note) of a serious and compelling reason for a missed exam.

COURSE CONTENT & WORK:

1) **Lecture Exams**. There will be 4 exams. Material covered will include everything covered in lecture since the prior exam.

2) **Lecture Final Exam**. There will be a cumulative final exam during finals week

3) **Online Lecture Quizzes.** There will be 12 online quizzes that pull questions from a much larger question bank to assess your comprehensive knowledge of specific concepts. Each quiz is timed (approximately 30 minutes) and questions are offered only one-at-a-time (no backtracking)

4) **Lab Activities.** Each lab session will have a graded lab worth 10 points each. To prepare for lab that day, you must move through the materials posted on Canvas and take the pre-lab quiz PRIOR to the class period. The instructor will then give an introductory lecture on the experiments you will be completing in lab and then you will have the rest of the class time to complete the lab and corresponding lab assignment on Canvas. You then need to complete the post-lab quiz by the end of the day to assess your understanding of the experiments.

Pre-Lab Quiz	2.5 points
In-Class Lab Assignment	5 points
Post-Lab Quiz	2.5 points
Total Points for Lab Activity	10 points

5) **Weekly Lab Quizzes**. You will have a 20 point lab quiz at the end of each week testing you on the concepts learned that week, as well as the experiments you completed during your lab. All these quizzes will open Friday morning and close Sunday evening.

6) **Lab Report.** You will be writing a lab report that mimics portions of a scientific paper throughout this term. You will be writing your lab report on Lab Exercise 1: Experimental Design. Your lab instructor will guide you through the steps of writing each section (Introduction, Results and Conclusions) throughout the term and provide you with constructive feedback for you to make changes before submitting the final lab report during Week 15. You will receive a grade for each draft and your final lab report.

GRADE BREAKDOWN

Component	pts		Lecture
Canvas Quizzes	120	Online	12 quizzes, 10 pts each
Lecture Exams	400	Online	4 lecture exams 100pts each
Final Exam	200	Online	1 final exam 200pts, cumulative exam
			Lab
Lab Activities	120	Online	13 lab activities, lowest score will be dropped for a total of 12 activities counted 10pts each
Weekly Lab Quizzes	240	Online	13 weekly quizzes, lowest score will be dropped for a total of 12 activities counted 20pts each
Lab Report Drafts	20	Online	Introduction 5 points each Methods 5 points each Results 5 points each Discussion 5 points each
Final Lab Report	50	Online	1 final lab report
Total Points	**1150**		

GRADING

You will receive a single grade for the lecture and lab portions of the course. Letter grades will be determined based on the grading scale below.

A = (93% - 100%) C+= (77% - 79%)
A- = (90% - 92%) C = (73% - 76%)
B+ = (87% - 89%) C- = (70 – 72%)
B = (83% - 86%) D = (60% - 69%)
B- = (80% - 82%) F = (Below 59%)

LECTURE SCHEDULE:

Week	Day	Lecture Topic
1	1	**Introduction to Physiology & Homeostasis** a. Organization of physiology b. Experimental Design **Chemistry & Biochemistry Review** a. Chemical bonds b. pH and solubility c. Organic molecules
	2	**Cellular biology** a. Energy, chemical reactions and enzymes b. ATP and cellular respiration c. Anaerobic processes and sources of fuel
2	1	**Membrane Transport** a. Passive & Active Transport b. Protein transporters c. Osmosis and tonicity
	2	**Cell communication & Neurophysiology**

		a. Mechanisms of cells communicating b. Organization of the nervous system c. Cells of the Nervous System
3	1	**Exam 1**
	2	**Neurophysiology I** a. Resting, Graded and Action potentials b. Refractory periods and myelination c. Chemical synapses
4	1	**Neurophysiology II** a. Brain b. Spinal Cord
	2	**Neurophysiology III** a. a. General Senses b. b. Special Senses
5	1	**Neurophysiology IV** a. Motor and Reflexes b. Autonomic Nervous System
	2	**Muscle Physiology I** a. Muscle fiber anatomy b. Sliding filament model (muscle contraction)
6	1	**Muscle Physiology II** a. Neuromuscular junctions b. Sources of ATP generation in muscles c. Fuel sources and fatigue
	2	**Muscle Physiology III** a. Muscle fiber types (I and II) and recruitment Introduction to the Mechanics of body movement b. Smooth Muscle Physiology
7	1	**Exam 2**
	2	**Cardiovascular system** a. Heart anatomy b. Flow and resistance
8	1	**Cardiac Physiology I** a. Contractile cell action potentials b. Trigger Ca^{2+} & Cardiac output
	2	**Cardiac Physiology II** a. Pacemaker action potentials b. Cardiac cycle c. Epinephrine/norepinephrine & cardiac output d. Modulating heart rate
9	1	**Blood Flow** a. Vessel anatomy b. Flow and pressure in various vessels c. Exchange at the capillaries
	2	**Hematology I** a. Blood composition b. Erythrocyte physiology c. Hemostasis
10	1	**Respiratory I** a. Anatomy of the respiratory system

		b. Ventilation
	2	**Respiratory II** a. Partial pressures b. Gas exchange c. Gas transport d. Acid-base balance e. Hypoxia and high altitudes
11	1	**Exam 3**
	2	**Renal Physiology I** a. Anatomy of the urinary system b. Micturition c. Nephron function
12	1	**Renal Physiology II** a. Filtration b. Reabsorption c. Secretion
	2	**Renal Physiology III** a. Hormonal control of water and salt balance b. Pathways for water & salt conservation/excretion
13	1	**Endocrinology I** Hormones & classes
	2	**Endocrinology II** a. Hypothalamus-pituitary axis Thyroid
14	1	**Endocrinology III** a. Adrenal Gland b. Reproductive System c. Pancreas
	2	**Digestive System** a. Mechanical and Chemical Digestion b. Reabsorption
15	*1*	**Digestive System** a. Elimination b. Regulation of the Digestive System
	2	**Exam 4**
16	1	**Final Exam**

*Note: The class schedule is subject to change during the semester, at the instructor

LAB SCHEDULE

Week	Topic	Lab Report Drafts
1	**NO LAB**	
2	Lab Introduction, Safety Training	
3	Lab Exercise 1: Experimental Design	
4	PhysioEx 1: Cell Transport Mechanisms and Permeability	
5	PhysioEx 3: Neurophysiology of Nerve Impulses	Draft of Methods Section Due
6	Interactive Physiology: The Muscular System	
7	PhysioEx 2: Skeletal Muscle Physiology	
8	PhysioEx 5: Cardiovascular Dynamics	Draft of Results Section Due
9	PhysioEx 6: Cardiovascular Physiology	
10	PhysioEx 11: Blood Analysis	
11	PhysioEx 7: Respiratory System Mechanics Interactive Physiology: The Respiratory System	Draft of Introduction Section Due
12	PhysioEx 9: Renal System Physiology	
13	Interactive Physiology: The Endocrine System	Draft of Discussion Section Due
14	PhysioEx 4: Endocrine System Physiology	
15	PhysioEx 8: Chemical and Physical Processes of Digestion Interactive Physiology: The Digestive System	Final Report Due

ACADEMIC HONESTY
Students are expected to read and abide by the University's Academic Honesty Policy, which can be found at: http://catalog.calstatela.edu/NXT/gateway.dll/currentcatalog-30/newlevel00082/depttitle00086.htm?f=templates$fn=document-frame.htm$3.0$vid=calstate:current$force=287
Students who violate this policy will be subject to disciplinary action determined by class professor and departmental chair.

ADA STATEMENT
Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation.

Student Services Support Offices and Resources.

Center for Academic Success (Tutoring and Writing Center):
https://www.calstatela.edu/academic-success (Links to an external site.)

Office of Students with Disabilities (OSD):
http://www.calstatela.edu/osd (Links to an external site.)

University Library:
https://calstatela.libguides.com/libraryaccess (Links to an external site.)

Student Advising Services:
http://www.calstatela.edu/advising (Links to an external site.)

Dean of Students Office:
http://www.calstatela.edu/deanofstudents (Links to an external site.)

Counseling and Psychological Services (CAPS):
http://www.calstatela.edu/studenthealthcenter/ca (Links to an external site.)ps

ITS resources for students:

http://www.calstatela.edu/its/helpdesk/studentresources

ITS Helpdesk Information:

http://www.calstatela.edu/its/helpdesk