BISC 307 (General Physiology), Spring 2016

Lecture Schedule

Date	Day	Topic	Silverthorn – 7th Ed.	Quizzes*
Jan 11	M	01 Introduction	Ch 1, Ch 6 (182-191)	
Jan 13	W	02 Evolutionary Perspectives	See Blackboard for resources	
Jan 15	F	03 Membrane Dynamics	Ch 5	Quiz 1
Jan 18	M	*Holiday (MLK Day)*	-----	
Jan 20	W	04 Cellular Communication	Ch 6 (165-182)	
Jan 22	F	05 Electrical Signals in Neurons	Ch 8 (226-253)	Quiz 2
Jan 25	M	06 Action Potentials	Ch 8 (226-253)	
Jan 27	W	07 Synaptic Transmission 1	Ch 8 (253-271)	
Jan 29	F	08 Synaptic Transmission 2**	Ch 8 (253-271)	Quiz 3
Feb 1	M	09 Autonomic Nervous System	Ch 11 (358-371)	
Feb 3	W	10 Skeletal Muscle 1	Ch 11 (371-375), Ch 12 (377-393)	
Feb 5	F	11 Skeletal Muscle 2	Ch 12 (393-403)	Quiz 4
Feb 8	M	***EXAM 1***	Jan 11 through Feb 3	
Feb 10	W	12 Smooth Muscle	Ch 12 (403-411)	
Feb 12	F	13 Intro to Endocrine Physiology	Ch 7	Quiz 5
Feb 15	M	*Holiday (President's Day)*	-----	
Feb 17	W	14 Metabolism & Energy Balance 1	Ch 22 (693-719)	
Feb 19	F	15 Metabolism & Energy Balance 2	Ch 22 (693-719)	Quiz 6
Feb 22	M	16 Adrenal Glucocorticoids	Ch 23 (729-736)	
Feb 24	W	17 Thyroid, Growth Hormone	Ch 23 (736-743)	
Feb 26	F	18 Calcium Balance***	Ch 23 (743-751)	Quiz 7
Feb 29	M	19 Reproduction 1	Ch 26 (800-815)	
Mar 2	W	20 Reproduction 2	Ch 26 (816-827)	
Mar 4	F	21 Reproduction 3	Ch 26 (827-837)	Quiz 8
Mar 7	M	***EXAM 2***	Feb 5 through Mar 2	
Mar 9	W	22 Cardiovascular System 1	Ch 14 (435-454)	
Mar 11	F	23 Cardiovascular System 2	Ch 14 (435-454)	Quiz 9
Mar 14	M	*Spring Break*	-----	
Mar 16	W	*Spring Break*	-----	
Mar 18	F	*Spring Break*	-----	-----
Mar 21	M	24 Heart as a Pump 1	Ch 14 (454-475)	
Mar 23	W	25 Heart as a Pump 2	Ch 14 (454-475)	
Mar 25	F	26 Blood Vessels & Pressure	Ch 15 (477-491)	Quiz 10
Mar 28	M	27 Distribution of Blood	Ch 15 (492-507)	
Mar 30	W	28 Blood	Ch 16	
Apr 1	F	29 Mechanics of Breathing	Ch 17	Quiz 11
Apr 4	M	30 Gas Exchange & Transport 1	Ch 18	
Apr 6	W	31 Gas Exchange & Transport 2	Ch 18	
Apr 8	F	***EXAM 3*****	Mar 4 through Apr 4	Quiz 12
Apr 11	M	32 Kidney Function & Filtration 1	Ch 19 (589-602)	
Apr 13	W	33 Kidney Function & Filtration 2	Ch 19 (589-602)	
Apr 15	F	34 Tubular Reabsorption & Secretion	Ch 19 (602-615)	Quiz 13
Apr 18	M	35 Water & Salt Balance	Ch 20 (618-636)	
Apr 20	W	36 Volume, Osmolarity, Acid-Base Balance	Ch 20 (636-652)	
Apr 22	F	37 Digestive System 1	Ch 21 (654-663)	Quiz 14
Apr 25	M	38 Digestive System 2	Ch 21 (664-672)	
Apr 27	W	39 Digestive System 3	Ch 21 (672-687)	
Apr 29	F	40 Digestive System 4	Ch 21 (672-687)	-----

* Quizzes are distributed via Blackboard by 5 pm on indicated Fridays, and are due the following Tuesday by 10 am.
** Friday, January 29 is the last day to drop without a mark of "W" and with tuition refund.
*** Friday, February 26 is the last day to drop without a mark of "W" and without tuition refund.
**** Friday, April 8 is the last day to drop with a mark of "W".

May 4	W	***EXAM 4***, 2:00 – 4:00 pm	Apr 6 through Apr 29

A. General Course Description and Policies

Description

BISC 307L General Physiology (4 units, Spring semester only) Physiological functions of the circulatory, digestive, endocrine, integumentary, musculoskeletal, nervous, respiratory, and urogenital systems of animals. Lecture, 3 hours; laboratory, 3 hours. Prerequisite: BISC 220L or BISC 221L.

Overview

Physiology is unique among the biomedical sciences in its focus on the functions of intact, living organisms. It is especially concerned with homeostasis, which refers to regulation of conditions inside the body within the narrow limits that are compatible with life. This course will cover the physiology of animal cells, tissues, organs, and organ systems, with emphasis on mechanisms by which homeostasis is maintained, and on the integration of each system with others in the living animal. Human systems are emphasized.

Instructor

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Textbooks

- *Human Physiology: An Integrated Approach*, by Dee Unglaub Silverthorn, 7th edition. *Note:* The 7th edition is not substantially different from the 6th edition. Students interested in saving money may opt for the older version. The corresponding reading assignments for the 6th edition will be posted on Blackboard. Users of the 6th edition should consult the 7th to check for differences. Copies of the 6th and 7th edition will be available for use in Biospace (ZHS 360A).

Blackboard

https://blackboard.usc.edu/

- All course materials, information, recordings, quizzes, and grades will be posted on Blackboard until Commencement Day. We will also make extensive use of Blackboard discussion forums, as will be explained in lecture. Blackboard is to be used only for appropriate, course-related activities. Use for other purposes will result in disciplinary action.

Lecture

MWF 1:00-1:50 pm, THH 101, class no. 13018R

- Lecture section meetings will be recorded and made available as streaming video and downloadable audio podcasts. Links to download sites will be posted in Blackboard.
- For some topics, basic or introductory material will be presented via short, pre-recorded video lectures. When we meet in class, I can then use the lecture time to present the more advanced aspects of the topic. So, it is important that you view and understand the pre-recorded lectures before coming to class. This approach should also free up lecture time for interactive problem-

solving, discussion of applications, and analysis of recent research – activities that will help you prepare for the lecture exams. Not every topic will follow this approach. Some topics will be covered entirely by traditional lectures. All in-class activities will be recorded and archived as streaming video and downloadable audio files.

- *Important Advice:* Please do not use the lecture recordings as a substitute for regular attendance at lecture or as an excuse to procrastinate. In the past, students who earned the highest grades were those who attended nearly every lecture and took careful notes. Shortly after each lecture, use the recordings to fill gaps in your notes and to review difficult material. In this way, you will keep up with the lecture schedule and reserve the time just before exams to review material you already learned. Be creative in your use of these recordings. For example, keep track of the approximate elapsed time during the lecture, so you can note the timing of material you need to review. Try viewing the video recordings in small groups, so you can pause and discuss the material as you proceed. Take advantage of the portability of the audio recordings. Download them to your phone or other mp3 player and look for opportunities to listen when you are not otherwise occupied with mindful tasks. Speed up the playback or better yet, slow it down!

Laboratory

- See Part B below for the complete laboratory syllabus.

Lecture Exams

Exam 1: Monday, Feb 8, 1:00-1:55 pm
Exam 2: Monday, Mar 7, 1:00-1:55 pm
Exam 3: Friday, Apr 8, 1:00-1:55 pm (N.B. – This is the last day to drop classes with a W.)
Exam 4: Wednesday, May 4, 2:00-4:00 pm

- Exams will consist mostly of objective questions (e.g., multiple choice, true-false, etc.), with a few short-answer essay questions. Exams cover lecture subjects only; laboratory subjects will not be covered. Lecture exams are not cumulative; each of the four exams will be worth the same number of points and will cover one quarter of the course, or 10 lectures, as specified in the Lecture Schedule. There will not be a comprehensive final.
- Thoroughly memorizing and understanding the terms and concepts is essential. However, this level of learning will leave you only about half-prepared for the lecture exams. On exams, you will be required to *apply* what you learned to solve novel problems, many of which will pertain to situations that we never discussed. Students find this approach very challenging but when they master it, as most of you will, the level of satisfaction is high. Even better, you will discover that you learned more than you thought you would. I will not ask more of you than you can handle, if you are willing to work hard. Please see the next section (Lecture Quizzes) for additional comments on exam questions.

Lecture Quizzes

- Fourteen quizzes will be administered via Blackboard. The quizzes will be posted by 5 pm on Fridays and must be completed by 10 am on the following Tuesday. Questions will cover the lecture material discussed on the previous Friday, Monday, and Wednesday (see the table below for specific coverage). Each quiz will consist of 4 questions, worth 0.5 points each. Question types will be multiple choice, true/false, or short answer. To allow students to miss a few quizzes for any reason, and to excuse uncharacteristically low scores, only the highest 12 scores will be counted toward the final grade. Therefore, a maximum of 24 points can be earned from the quizzes, or 4 % of the total course grade. No accommodations will be made for students who take fewer than 12 quizzes. Quiz results and correct answers will be discussed at the start of the Thursday morning Q&A session (see below).

- My intention is to make the quiz questions as challenging as those that will appear on the more point-heavy exams. To do well in this course, it will not be sufficient to merely look up or memorize answers. You must also be able to apply your knowledge to solve novel thought problems. The quizzes are designed to give you low-stakes practice at this and to gauge your level of preparation for exams. This will only work, however, if you take the quizzes seriously and responsibly. You may consult your textbook and any other printed or electronic material. You may also discuss the quiz questions with fellow students, if those discussions focus on understanding the underlying principles. You should not simply share or reveal your answers to other students, nor try to obtain answers from current or former students, for several reasons. First, you will not know until after the deadline whether your answer is correct. Second, you will deprive that student of a learning opportunity. Third, you will diminish your own chances for a better grade by broadcasting your hard-won answers. Fourth, quiz questions are revised regularly, usually with the goal of making them more challenging. Each quiz is worth only 0.3% of the course grade, but its potential value as a learning tool is much greater. The quizzes will require a disproportionately large amount of effort – on my part to craft challenging questions, and on your part to discern and understand the correct answers. It is likely that students who cheat by merely copying other students' quiz answers will pay a price on exam days. Please don't be one of those students. In the 10 years since we introduced the quizzes in BISC 307, students have come to see them as one of the most challenging parts of the course, but also one of the most valuable. If you take the quizzes seriously, we think you will come to the same conclusion.

- The following table summarizes important information about the quizzes.

Quiz No.	Posted by 5 pm on Fri	Deadline 10 am on Tues	Lectures Covered
1	Jan 15	Jan 19	1, 2
2	Jan 22	Jan 26	3, 4
3	Jan 29	Feb 2	5, 6, 7
4	Feb 5	Feb 9	8, 9, 10
5	Feb 12	Feb 16	11, 12
6	Feb 19	Feb 23	13, 14
7	Feb 26	Mar 1	15, 16, 17
8	Mar 4	Mar 8	18, 19, 20
9	Mar 11	Mar 22	21, 22
10	Mar 25	Mar 29	23, 24, 25
11	Apr 1	Apr 5	26, 27, 28
12	Apr 8	Apr 12	29, 30, 31
13	Apr 15	Apr 19	32, 33
14	Apr 22	Apr 26	34, 35, 36

Twice Weekly Question & Answer Sessions

- Dr. Herrera will hold Q&A sessions at the following times and places.
  Thursdays, 12:00-12:50 pm, HNB 100 (results and answers of online quizzes discussed)
  Fridays, 2:00-3:00 pm, ACB 238 (no Friday Q&A session on Feb 12, Mar 11, or Apr 8)
- Q&A sessions will be recorded and made available as streaming video and downloadable audio podcasts. For those unable to attend in person, Q&A sessions will also be webcast live with text-based chat so that questions can be submitted remotely. Instructions for accessing live and recorded Q&A sessions will be posted in Blackboard and announced in class.

- Although no deliberate attempt will be made to record or identify students who are present at Q&A sessions, and students will not be on-camera, please be aware that in the confines of the room, students' voices may be audible and recognizable.

Instructor Office Hours

Please contact Dr. Herrera directly for office hour appointments. Office hours are intended for discussion of individual, confidential matters such as grades, personal problems that affect class performance, etc. Course subject matter and other public issues should be discussed in the Q&A sessions, so that all students can benefit from the interchange. The Lab Manager, Dr. Moore, will be generally available in his office, which is adjacent to the laboratory, during normal working hours. Teaching Assistants will announce their office hours in their lab sections.

Grading

- Grades will be based on the total number of points earned on exams, online quizzes and laboratory work, as shown in the table below. After each exam, a curve and table will be posted that shows the letter grades that correspond to current point totals.

Portion	Item	Pts Each	Number	Total	Portion Totals
Lecture	Exams 1-4	94	4	376	
	Online Quizzes	2	14	24*	Lecture = 400 pts
Laboratory	Presentation	35	1	35	
	Presentation participation	5	1	5	
	Lab Report-Introduction	15	1	15	
	Lab Report-Results	15	1	15	
	Lab Report-Discussion	15	1	15	
	Full Lab Report	50	1	50	
	Teaching Lab Exercise	50	1	50	
	General Participation	---	---	15	Lab = 200 pts
*Only the highest 12 quiz scores will count.					Course total = 600 pts

- Final letter grades will be determined by the following scheme. The mean point total of the top 10% of students will be determined. Students who earn a certain high percentage of that mean will earn an A or A-. Students whose totals fall below the A- level but above a certain lower percentage will earn a B+, B, or B-. Students below the B- level but above an even lower percentage will earn a C+, C, or C-, etc.
- *An important consequence of this scheme is that, for the most part, grading is not competitive in this class.* There are not fixed numbers of As and Bs to be assigned. The more the point totals are skewed (cluster) toward high values, the more As and Bs will be assigned.
- *This scheme was devised to facilitate cooperative learning and peer instruction.* High-achieving students should help others; doing so will not jeopardize their high grades. By teaching others, students will solidify their own understanding. Methods for accomplishing this will be discussed.

Exam Policies

- Re-grading: Answers to lecture exam questions will be posted on Blackboard shortly after each exam. Corrected exams will be handed back during your lab period. If you feel an error was made in the grading of your exam, you should make your case in writing on separate sheets of paper. Specify which questions you think were incorrectly graded and why. Give these sheets and your exam to your TA *before you leave the lab*. Exams taken from the lab will not be re-

graded. The entire answer of each indicated question will be re-graded, not just the part you think deserves more credit. In addition, instructors will review the entire exam to check for errors in grading. Your score may increase or decrease as a result of this re-examination.

- Missed Exams: *No make-up exams will be given.* Students who are unable to take an exam at the schedule time must contact Dr. Herrera as soon as possible, preferably in advance. If the student has a valid, well-documented reason for missing the exam, a score equal to the average of the other 3 exams will be assigned. Such an adjustment can be made for only one exam. Students who are ill and miss a regularly scheduled lecture or laboratory exam must see a doctor to document their illness. Within 48 hours of the missed exam, you must provide, in writing, the following information: 1) your doctor's name and telephone number, and 2) a statement signed by you authorizing us to discuss the situation with your doctor. We will contact your doctor and ask her or him whether you were too ill to take the exam. Note that neither you nor the doctor need tell us the nature of your illness. Simply visiting the Engemann Student Health Center or another medical facility will not be considered a valid medical excuse. Similarly, if an emergency prevents you from taking an exam, you must provide convincing documentation of the emergency. If your excuse is judged not to be valid, or you do not provide it within the allotted time, you receive a score of zero for the missed exam.
- Missing Exam 4: If you miss Exam 4 and you provide a valid medical excuse or proof of emergency within 48 hours after the scheduled exam time, a course grade of Incomplete (IN) will be assigned. It will be your responsibility to contact Dr. Herrera to make arrangements for completing the course and replacing the IN with the grade you earned. You have a year to complete the requirements for removal of an IN. After this, your grade will change to an IX (Lapsed Incomplete) which counts as an F in the GPA. If you miss Exam 4 and do not submit a valid excuse, a course grade will be calculated based on your other scores and a zero for Exam 4.

Academic Integrity

- Our university depends on honesty, integrity, and ethical behavior among its members. For students, ethical behavior includes respecting the intellectual property of others, submitting individual work unless otherwise directed by the instructor, protecting one's own academic work from misuse by others, and avoiding the use of another's work as one's own.
- We have reliable, time-tested methods for detecting cheating, plagiarism, and other violations of academic integrity. Please note that to protect the integrity of grades and the academic process, sanctions for violations are severe. The minimum sanction is usually an F for the course. Suspension or expulsion from the university is also possible.
- Here is a partial list of actual violations that have been perpetrated by students in my classes in recent years. The numbers in parentheses refer to relevant paragraphs in the University Governance section of SCampus (see resource #5 below).
  1. Copying answers from other students during lecture or lab exams. (11.13)
  2. Submitting lab reports containing substantial portions plagiarized from other students. (11.11, 11.12)
  3. Use of Blackboard resources for commercial gain (11.19)
  4. Selling class notes and material downloaded from Blackboard to a web-based company that re-sells such material. (11.12B)
  5. Re-submission of a lab report written by the same student in an earlier semester. (11.16)
  6. Altering answers on a graded exam and submitting the altered exam for re-grading. (11.13B)
  7. Continuing to write answers on an exam after time has been called. (11.21)
  8. Unauthorized use of personal electronic devices, e.g., smartphones, during exams. (11.13)
  9. Students using multiple clickers to gain participation points for non-attending students. (11.18)

  - All of these offenses were serious and resulted in disciplinary action. Do not attempt any of these!

- Resources on academic integrity standards, policies, and expectations:
  1. Trojan Integrity Guide: http://www.usc.edu/student-affairs/SJACS/forms/tio.pdf
  2. Guide for Avoiding Plagiarism: http://www.usc.edu/student-affairs/SJACS/forms/tig.pdf
  3. Overview of Academic Integrity: http://www.usc.edu/student-affairs/SJACS/forms/AcademicIntegrityOverview.pdf
  4. Tutorial on Academic Integrity: http://www.usc.edu/libraries/about/reference/tutorials/academic_integrity/index.php
  5. SCampus (University Governance, paragraph 11): http://web-app.usc.edu/scampus/1100-behavior-violating-university-standards-and-appropriate-sanctions/

Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with the Office of Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP and should be delivered to Dr. Moore early in the semester, *at least two weeks before Exam 1*. If a student's approved accommodation is limited to extra time on examinations, the teaching staff of BISC 307 will provide the accommodation. For any other accommodation, such as a private room, translator, etc., students must make arrangements with the DSP office at least 2 weeks before each exam date. For more information, you can visit the DSP office in STU 301 (8:30-5:00, M-F), call at 213-740-0776, email at ability@usc.edu, or go to their website: (http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html).

Policies Concerning Student-Athletes

Student-athletes may not be penalized when University-sanctioned competitions conflict with course assignments or exams. When a class will be missed for a sanctioned competition, it is the student-athlete's responsibility to approach the instructor in advance and to provide a letter from Magdi El Shahawy, Director of Student-Athlete Academic Services. The letter must certify that the competition is a University-sponsored event that deserves accommodation. Accommodations will not be made for other types of conflicting events. Details on the University's policy can be found at http://www.usc.edu/admin/provostoffice/ocaaa/guidelines.html.

Final arrangements for the accommodation must be agreed upon in advance of the event. If multiple team members will be absent, each must make an individual arrangement with the instructor. If an assignment is due on the date when class is missed, the instructor may require that it be turned in before the missed class or at the first class meeting after the student returns. If an exam is scheduled for the date when class is missed, the instructor may arrange with SAAS to have the test administered by an academically qualified proctor (not a coach) during the trip. Alternatively, the instructor may agree to pro-rate the exam score, i.e., substitute the missing exam score with the average of the scores of the other exams.

Email Communication

To ensure privacy, only students' USC computer accounts (*usc.edu* domain name) can be used for email communications regarding confidential matters. Other email accounts (gmail, yahoo, other domains) cannot be used. Students are responsible for understanding the content of official messages that instructors send to their USC email accounts. Therefore, each student must check their USC email regularly to make sure their account is not over-quota, so new messages can be received.

B. Laboratory

Lab Schedule

Wk	Dates	Day	Exercises	Comments
1	Jan 12 ↓ Jan 15	Tu ↓ Fri	Introduction to Lab 1	Safety issues; Discussion of Group Presentations
2	Jan 19 ↓ Jan 22	Tu ↓ Fri	Introduction to Lab 2	Discussion of Lab Reports & Teaching Exercise
3	Jan 26 ↓ Jan 29	Tu ↓ Fri	*No lab this week*	
4	Feb 2 ↓ Feb 5	Tu ↓ Fri	Group Presentations	PowerPoint presentations & discussion of classic scientific papers
5	Feb 9 ↓ Feb 12	Tu ↓ Fri	Cardiovascular Physiology (Human)	Subject of Partial Lab Report 1: Introduction (due week of Feb 17-20)
6	Feb 16 ↓ Feb 19	Tu ↓ Fri	Skeletal Muscle Contraction (Human); Submit Partial Lab Report 1	Subject of Partial Lab Report 2: Results (due week of Feb 24-27)
7	Feb 23 ↓ Feb 26	Tu ↓ Fri	Nerve Conduction, Skeletal Muscle Contraction, Heart Function (Frog); Submit Partial Lab Report 2	
8	Mar 1 ↓ Mar 4	Tu ↓ Fri	Plan, discuss, and submit proposal (within 48 h) for Teaching Exercise using frog preparation	
9	Mar 8 ↓ Mar 11	Tu ↓ Fri	Obtain results for Frog Teaching Exercise	Each group performs its own experiments.
10	Mar 15 ↓ Mar 18	Tu ↓ Fri	*Spring Break Week*	
11	Mar 22 ↓ Mar 25	Tu ↓ Fri	Lung Function – Spirometry (Human); Submit Teaching Exercise	
12	Mar 29 ↓ Apr 1	Tu ↓ Fri	Kidney Function – Urinalysis (Human)	Subject of Partial Lab Report 3: Discussion (due week of Apr 14-17)
13	Apr 5 ↓ Apr 8	Tu ↓ Fri	Plan, discuss, and submit proposal (within 48 h) for human experiments for Full Lab Report; Begin experiments	Each group performs its own experiments.
14	Apr 12 ↓ Apr 15	Tu ↓ Fri	Experiments for Full Lab Report; Submit Partial Lab Report 3	Each group performs its own experiments.
15	Apr 19 ↓ Apr 22	Tu ↓ Fri	Experiments for Full Lab Report; Course Evaluations	Each group performs its own experiments. Do course evaluations.
16	Apr 26 ↓ Apr 29	Tu ↓ Fri	Consult with your TA on analyses, literature searches, and writing for Full Lab Report	Attendance is not mandatory but is highly recommended.
17	May 2	Mon		Full Lab Report due by noon

Goals of the Laboratory

- The laboratory is an integral and essential component of the course, with 3 main goals:

1. Give you hands-on experience with the processes, tissues, and concepts discussed in the lecture part of the class.
2. Encourage the development of scientific literacy, i.e., the ability to find, read, comprehend, and discuss original research articles from the physiology literature.
3. Deepen your appreciation of the scientific method by requiring you to design, execute, and analyze your own experiments.
4. Develop writing skills in the format of scientific research papers and a lab manual exercise.

Laboratory Sections *(subject to revision)*

In ZHS 372:

Tue am	11:00-1:50	13284R
Tue pm	3:00-5:50	13288R
Wed am	8:00-10:50	13281R
Wed pm	2:00-4:50	13286R
Thu am1	8:00-10:50	13282R
Thu am2	11:00-1:50	13285R
Thu pm	3:00-5:50	13289R
Fri am	8:00-10:50	13283R
Fri pm	2:00-4:50	13287R

In ZHS 258:

Tue am1	8:00-10:50	13290R
Tue am2	11:00-1:50	13294R
Tue pm	3:00-5:50	13298R
Wed am	8:00-10:50	13291R
Wed pm	2:00-4:50	13296R
Thu am1	8:00-10:50	13292R
Thu am2	11:00-1:50	13295R
Thu pm	3:00-5:50	13299R
Fri pm	2:00-4:50	13297R

Lab Manual

- A laboratory manual will not be required for this class. Handouts (PDFs) describing the lab exercises will be distributed via Blackboard.

Lab Grading

- Performance in the lab will account for one third of each student's grade. The lab grade will be based on a group presentation, participation in others' presentations, lab reports, development of a teaching lab exercise, and general participation. Descriptions of these items follow. See the Grading Table (page 5, above) for point values.

Lab Performance Guidelines

- You are expected to attend all lab sessions on time and to remain for the entire period or until excused by your TA. Unexcused absences will affect your general participation scores.
- For some lab exercises, it will be necessary for you to place your backpacks, purses, and other materials under the tables. Please follow your TA's instructions. At the end of the lab session, please clean your work area. Return supplies to their proper place. Dispose of chemicals, animal tissues, sharp objects, and contaminated material appropriately. Close all open applications on your computer workstations.

Group Presentations

- In groups of two, students will present classic papers from the primary research literature in physiology. The purpose of this exercise is to enhance scientific literacy, as well as improve your skills in communication and collaborative problem solving. We also hope you will gain a deeper understanding of the origin of physiological knowledge and the links between early discoveries and current research. For a complete description of group presentation requirements, see the document "Guidelines for BISC 307 Group Presentations" posted in Blackboard. Here is a brief summary:

1. During the lab meeting in the first week of the semester, groups consisting of 2 students each will be formed.

2. Each group will select one classic physiology paper from a list that will be provided in Blackboard. Copies of the papers in PDF format will also be available in Blackboard. Other papers can be used, but these must be approved in advance.
3. During the 3rd or 4th week of the semester, each group will give a 20 minute PowerPoint presentation to their lab section, and then conduct a 5-10 minute session for questions, answers, and discussion.
4. Grading will be based on each student's participation in her/his group's presentation, as well as participation in the presentations of other groups.

Lab Reports

- Developing the ability to write a high-quality lab report is one of the primary learning objectives of the laboratory portion of this class. Because they integrate so many other laboratory skills, almost half of the lab points will be based on these lab reports – about the same as a lecture exam! The requirements and grading policies for lab reports is given in the document "Guidelines for BISC 307 Lab Reports" posted in Blackboard. *Please read this document.*
- Lab reports will be written in the standard format of a scientific research paper, with 5 sections: Introduction, Methods, Results, Discussion, and References. To help you master writing in this format, you will asked to write 3 Partial Lab Reports based on the exercises you perform during weeks 5, 6, and 12 of the semester. Please refer to the Lab Schedule on p. 9 to see the topics of these exercises. Although Partial Lab Reports 1, 2, and 3 must contain all 5 sections listed above, grading will emphasize the Introduction, Results, and Discussion sections, respectively. Partial Lab Reports 1 and 2 must be submitted within one week, i.e., by the start of the next lab period. Two weeks will be allotted Partial Lab Report 3, to avoid conflict with Lecture Exam 3. Each of these partial lab reports will be worth 15 points, for a total of 45 points.
- At the end of the semester (May 2), a Full Lab Report must be submitted. This Full Lab Report will be worth 50 points. All 5 sections will be carefully examined and graded. The subject of the Full Lab Report will be original experiments that your lab group conducted during the 13th, 14th, and 15th weeks of the semester. The lab meeting in the 13th week is reserved for planning and discussing your experiments with your TA and other students in your lab section. You may also begin your experiments on that day. Within 48 h of the 13th week lab session, you and your lab partner(s) must send your TA a 1-page proposal describing the experiments you intend to do. Instructions for the 1-page proposal will be published on Blackboard. The experiments you design should use the equipment and approaches employed in one or more of the following lab exercises: Cardiovascular Physiology (week 5), Skeletal Muscle Contraction (week 6), Lung Function – Spirometry* (week 11), or Kidney Function – Urinalysis (week 12).

  *In addition to the equipment used in the Lung Function – Spirometry lab, a limited number of devices for real-time measurement of O_2 and CO_2 in human subjects will be available.
- Please note that we have high expectations for the quality of both the partial and full lab reports. They will be graded stringently, according to the criteria described in the "Guidelines for BISC 307 Lab Reports" document.
- Submission of Lab Reports: All lab reports must be submitted electronically via Turnitin, using the link provided on the Blackboard site for your lab section. Once you submit your lab report, Turnitin will perform an originality review, searching for similarities between your text and other internet content or previously submitted student work. Each student will retain the copyright of her/his own original work. Turnitin is not permitted to use student-submitted work for any purpose other than a) performing an originality review of your work, and b) including your work in the database against which it checks other student-submitted work. Please see the section on Academic Integrity above for an explanation of why we are using Turnitin.
- It is your responsibility to confirm that your lab reports were successfully uploaded.

- Late Lab Reports: If you miss a lab report deadline, your report will lose 20% of its point value during every 24-hour period after the deadline. For example, let's say a student writes a report that would earn 40 of the 50 points available if it were submitted on time. If the same report were submitted late, after the deadline but before 24 hours after the deadline, the report would earn only 32 points. Point deductions would increase by an additional 20% for each subsequent 24 hour period of lateness.
- Excessive Quotation in Lab Reports: Please read p. 5 of the Guidelines document for advice on how to avoid this common pitfall, and for penalties that will be imposed should it occur.

Teaching Exercise

- Experimenting with living tissue from freshly euthanized animals is a privilege and a learning opportunity that can be tremendously valuable. Rather than asking you to perform typical lab exercises, we want to engage your creativity to plan and execute novel experiments, and then prepare a written report in the format of a Teaching Exercise. This document would be something like a chapter in a hypothetical laboratory manual for a class like ours. The document, which will be worth 50 points, should include sections that give the necessary background, methods, and procedure. Specific experiments should be described, sample results illustrated, and thought-provoking questions should be posed. Detailed instructions on the written format of the Teaching Exercise will be published on Blackboard.
- Experiments for the Teaching Exercise will use the sciatic nerve, skeletal muscle, or heart of the frog *Rana pipiens*. During the lab meeting in the 7th week you will familiarize yourself with dissecting and handling these preparations and with the equipment available to make measurements. The lab meeting in the 8th week is reserved for planning and discussing your project with your TA and other students in your lab section. Within 48 h of the 8th week lab session, you and your lab partner(s) must send your TA a 1-page proposal describing the specifics of your Teaching Exercise project. Instructions for the 1-page proposal will be published on Blackboard.

Final Thoughts

- Please forgive the length of this syllabus. We feel it is important for everyone to know exactly what to expect. We hope you will enjoy our mutual exploration of physiology. The mechanisms we will study are fundamentally important in all animals, and highly relevant to the understanding of human health. We promise to apply all of our experience in teaching and research, as well as some of the latest pedagogical techniques, to present an interesting and informative course and to assign grades fairly. Good luck!

Albert Herrera
11/03/2015