

BIOL 434 - Animal Physiology II
Lecture on Mon/Wed at 1:30-2:45 in BioSci 335

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Office: BioSci 235
Office Hours: Mon, Wed, 10 - noon
Tues, Thurs 10-11 am

BIOL 434 is the second course in the upper division animal physiology series that is designed for students interested in pursuing graduate training in research, medicine, veterinary medicine, dentistry or pharmacy. This course takes a **systems perspective** and covers cardiovascular, respiratory, renal and digestive physiology using lectures, laboratory exercises and reading assignments. Students will learn the basic physiology of each of these organ systems and integrate this knowledge to understand whole animal physiology. For example, students will understand how renal function influences cardiovascular physiology. Students will need to interpret and generate scientific data in graphical form, perform basic calculations and effectively communicate research results. For this course, it is important that students have successfully completed the prerequisite, BIOL 380. BIOL 434 builds on many of the concepts covered in the basic BIOL 100 series and the majors' core courses BIOL 300, 320 and 380. It will also be helpful (but not required) to have completed BIOL 433.

Textbook: Hall, J.E., *Guyton and Hall Textbook of Medical Physiology*, 12th Edition, Philadelphia: Elsevier, Inc. (2011).

Reading Assignments:

1. Wilcken, D.E. (2006). *Medicine* 34(5):165-69.
2. Lairon, D., et al. (2007). *Journal of Nutritional Biochemistry* 18:217-27.

Schedule

Date	Topic	Reading from Guyton and Hall
1/3/11	General Introduction	
1/5/11	Electrical activity of the heart	10, 11
1/10/11	Heart as a pump	9, 20
1/12/11	Blood flow and pressure, exchange	14, 15, 16
1/17/11	MLK – No class today	
1/19/11	Regulation of blood flow and pressure	17, 18, 19
1/24/11	Anatomy of the kidney, GFR, RBF	26
1/26/11	Reabsorption and secretion	27, 28, 30
1/31/11	Physiological Buffers	30
2/2/11	Control of renal function; micturition	29, 31
2/7/11	ECF composition and volume	25
2/9/11	Midterm Exam (through/including 2/7/11)	
2/14/11	Respiration, breathing mechanics, lung function	37, 38
2/16/11	Gas Exchange and pulmonary circulation	39

2/21/11	Gas Transport	40
2/23/11	Regulation of Respiration	41
2/28/11	GI motility, propulsion and digestion	62, 63
3/2/11	Control of secretion and motility	62, 64
3/7/11	Absorption	65
3/9/11	Liver and nutrition	70, 71
3/14/11	Final exam, 1:30-4:00 pm	

Grading

Midterm:	110 points (50 points each for cardiovascular and renal lecture material and 10 points for reading assignment 1.)
Final:	160 points (60 points each for respiratory and digestive lecture material, 15 points each for cardiovascular and renal lecture material, and 10 points for reading assignment 2.) Because of the nature of this HIGHLY INTEGRATIVE material, the final exam will be cumulative.
Attendance:	2 points/class period, not counting exam days = 34 points
Lab:	150 points (6 lab reports each worth 25 points, see lab schedule for instructions and due dates.)

Final grades will be based on the following distribution:

A	= 92-100%
A-	= 90-91.9%
B+	= 88-89.9%
B	= 82-87.9%
B-	= 80-81.9%
C+	= 78-79.9%
C	= 72-77.9%
C-	= 70-71.9%
D+	= 68-69.9%
D	= 60-67.9%
F	= <59.9%

Exam Policy

Exams will be composed of multiple choice, graphical interpretation, physiological calculations and short-answer questions. If you miss an exam for a legitimate and documented excuse (*e.g.*, a signed doctor's note), you *may* make the exam up with a slightly altered version of the original exam. If evidence of emergency can be provided for a missed final, an Incomplete will be given until the final exam the following summer quarter.

Only *your* medical emergency or illness will excuse you from an exam. Medical emergencies of relatives, friends, relatives of friends, friends of relatives, weddings, anniversaries, parties, *etc.* are not valid reasons for missing an exam. Nor are they valid reasons for asking me to allow you to take an exam during a time other than the scheduled time.

Attendance: To help ensure that people attend the lectures, I take attendance (2 points/class period) by passing around a "sign-in" sheet. You *must* print your name on this sheet *during*

class; please do not come up to me at some later time after class to tell me that you were not absent, but did not place your name on the sheet because you forgot, arrived late, *etc.* I do not have a photographic memory and will probably not remember if you indeed were really present.

Drop Policy

No exceptions will be made to the established University deadlines and policies

Academic Honesty Policy

Students are expected to read and abide by the University's Academic Honesty Policy, which can be found at <http://www.calstatela.edu/univ/stuaffrs/jao/doc/ah.pdf>. Students who violate this policy will be subject to disciplinary action, and may receive a failing grade in the course for a single violation.

BIOL 434 Animal Physiology II Laboratory

Mon (Section 2)/Wed (Section 3) 2:55-5:25 pm
LKH-ASC 343

Students will work in pairs, preferably the same pairs throughout the quarter, and work together to complete the 7 exercises in a timely fashion so that they can be turned in on the indicated due date (see Table below).

The lab exercises for this portion of the course will be taken from 2 different Lab manuals, shown below. Photocopies of pages from the Tharp manual, listed as **(1)**, will be provided and will be required for 5 out of the 7 planned exercises. The other 2 exercises are lab simulations and are found in Chapters 9 (renal physiology) and 8 (chemical digestion) of the Stabler manual, listed as **(2)**, which the lab also has.

(1) Lab Manual: Tharp, G.D. and Woodman, D.A., *Experiments in Physiology, 9th Edition*, San Francisco, Benjamin Cummings (2008).

(2) Laboratory Textbook/Manual. Stabler, T., Smith, L., Peterson, G., Lokuta, A. *PhysiolEx 7.0 for Human Physiology. Laboratory Simulations in Physiology*. Pearson, Benjamin-Cummings, 2008.

Date	Experiment	Manual Pages	Lab report due
Jan 3	Introduction to BIOPAC	handout	no lab report
Jan 5	Introduction to BIOPAC	handout	no lab report
Jan 10, 12	ECG (BIOPAC)	(1) 181-187	Jan 24, 26
Jan 17 (MLK) Jan 19	ECG (BIOPAC) cont'd		
Jan 24, 26	Pulse and blood pressure (BIOPAC)	(1) 175-181	Jan 31, Feb 2
Jan 31, Feb 2	Blood and Circulation	(1) 209-217, 228-232	no lab report

Feb 7, 9	Renal Physiology	(2) Exercise 9	Feb 14, 16
Feb 14, 16	Respiratory Function (BIOPAC)	(1) 191-199	Feb 21, 23
Feb 21, 23	Chemical Digestion	(2) Exercise 8	Feb 28, Mar 2
Feb 28, Mar 2	Fitness (BIOPAC)	(1) 237, 239-244	Mar 7, 9
Mar 7, 9	Wrap-up for those who need it		

For labs that use the BIOPAC system, please bring a computer disk to lab to save your data and analyze in the computer lab (BioSci 240).

Lab Reports:

Each report should have the following sections:

- Results: analyze and present the results as graphs or tables. Perform statistical analysis where needed. Summarize the results in one or two paragraphs.
- Discussion: discuss the meaning of the results and compare the values you obtained to published values. Properly cite the published values. Explain why or why not the experiment produced the expected values.
- References: list the references used in the Discussion
- **Indicate on the report the lab section to which you belong (Section 2 = Mon; Section 3 = Wed).**

Each student team should turn in 6 lab reports for the labs listed above during either lecture or lab. Only submit hard copies of the lab reports. All reports must be printed and double-spaced. Each report is worth 25 points; 15 points for the Results and data analysis, and 10 points for the Discussion and References.

Late reports will be deducted 3 points for every weekday they are late. Monday labs are due on the following *indicated* Monday; Wednesday labs are due on the following *indicated* Wednesdays. If a Monday lab turns in a report on a following Wednesday, that report will be considered 2 days late.