

Systems Physiology Laboratory (01:146:357)
Busch Campus, Nelson Biological Laboratories (NH, building 3559)
Room B-137

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Course Description

Physiology is an experimental, analytical, quantitative science. "The study of physiology is only half accomplished if you never enter the laboratory. It is one thing to hear a concept explained in lecture, but quite another to see the concept unfold before your eyes in a laboratory experiment." (Gerald D. Tharp, University of Nebraska). Systems Physiology Laboratory was designed by Gary F. Merrill to teach students classic, experimental, organ systems physiology. Laboratory experiments are performed in isolated organ preparations (e.g. skeletal muscle, sciatic nerve, heart), in whole animals that are anesthetized/euthanized (in situ experimentation), and in student subjects. Our laboratory classes meet once a week. The focus of each week's activity is hands-on experimentation rooted in classic animal physiology.

Learning goals of this course include but are not limited to:

- * Educating students in the basics of research in organ systems physiology
- * Increasing the student's basic laboratory skills (thinking, designing, performing live experiments)
- * Exposing students to the use of "state-of-the-art" data acquisition equipment
- * Conducting experiments that demonstrate fundamental physiological principles (including the use of physiological transducers)
- * Teaching students the proper techniques of scientific writing/reporting

Our experiments Include: * Introduction to Data Acquisition and LabChart Software Lab Experimental Design, * Striated Skeletal Muscle and Nerve-muscle Experiments, *Regulation of Blood Pressure, * Interpretation of ECGs in Humans and Other Vertebrates, * Osmolality and Water Balance (Kidneys), * Blood Glucose and Insulin, * Gastrointestinal Function, etc.

LATE POLICY: Lab sections begin at 8:30am, 2:00pm and 7:30pm. If you do not arrive before these times, lab doors are closed and you are late! This could affect your course final grade.

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LABORATORY SAFETY GUIDELINES

1. Become familiar with the location of all building/laboratory exits.
2. Know the location of laboratory safety equipment: first aid kit, fire extinguishers, eyewashes, and safety showers.
3. Wear personal protective gear where laboratory or experimental conditions dictate: lab coats, gloves, safety glasses are available for all students.
4. Wear clothes that protect the body against chemical spills, dropped objects, and other accidental contact. Thus, bare midriffs, shorts, open-toed shoes, sandals, and high heels are prohibited in the laboratory.
5. Eating and drinking are not permitted in the laboratory except when dictated by experimental protocol.
6. If body fluids are being studied, work only with your own. Precautions to prevent contact with body fluids may include wearing safety glasses, gloves, etc.
7. All disposable supplies that come in contact with body fluids must be discarded into appropriately marked containers for disposal.
8. Animal remains must be discarded into carcass bags for proper disposal.
9. Many of the experiments require students to serve as subjects. If you have, or have had any conflicting health conditions, please do not volunteer as a subject, for example cardiovascular disease (high blood pressure/hypertension, angina, etc.) do not perform stressful exercise in ECG experiment.
10. Before you exit the laboratory, wash your hands thoroughly.

2024 SPRING SEMESTER

LAB #	DATES	EXPERIMENT	WRITTEN ASSIGNMENT DUE (EXCLUDING QUIZZES AND LAB DEPARTMENT AND COMPLETION)
Lab #1	1/22 – 1/26	Intro to Lab Chart	
	1/29 – 2/2	How to Write a Lab Report	
Lab #2	2/5 – 2/9	Blood Pressure	
	2/12 – 2/16	LECTURE EXAM (2/15) No labs	
Lab #3	2/19 – 2/23	Human Heart	Introduction (Blood Pressure)
Lab #4	2/26 – 3/1	Frog Heart	Methods (Human Heart)
Lab #5	3/4 – 3/8	Blood Glucose	Discussion (Frog Heart)
	3/11 – 3/16	SPRING BREAK	
Lab #6	3/18 – 3/22	Frog Nerve	Abstract (Blood Glucose)
	3/25 – 3/29	LECTURE EXAM (3/25) No labs	
Lab #7	4/1 – 4/5	Kidney/Water Balance	
Lab #8	4/8/ - 4/12	Frog Muscle	Results (Kidney/Water Balance)
Lab #9	4/15 – 4/19	Human Muscle	
	4/22 – 4/26	LECTURE EXAM (4/25) No labs	Final Report (Frog Muscle)

Lab class summary

Quiz: Starting the second week of lab class, there will be a quiz each week. Quizzes will include information available in the corresponding module in Canvas, as well as information from the previous week's content (background material, mini-lecture and experiment).

Lecture Modules: Approximately 30-minute mini-lectures will be given immediately following the quiz in each section.

Lab department and completion: In part, points will be earned based on timely arrival, lab participation, satisfactory completion of each lab exercise, and proper clean-up of experimental stations.

Lab Reports: Writing assignments will accompany several of the experiments. These will include partial and complete lab reports.

Grading Policy

Lab department and completion; (50, 5pts x 10); Weekly Quizzes (45, 5pts x 9); Writing Assignments (60, 10pts x 3, Intro, Methods, Abstract; 15pts x 2, Results, Discussion); Final Lab Report (60, 60pts x 1 Full Report); TOTAL POINTS = 215

See "How to Write a Laboratory Report" for rubrics

Course Final Grade Distribution

A = (89.5 – 100)

B+ = (84.5 < 89.5)

B = (79.5 < 84.5)

C+ = (74.5 < 79.5)

C = (69.5 < 74.5)

D = (59.5 < 69.5)

F = (<59.5)

Plagiarism – One must do his/her own work when writing reports in System Physiology Laboratory. It is permissible to use short excerpts/quotes from the work of others; however, in any single report, these should be few and short. In all cases where the work of others is cited, credit must be given. When citing, avoid using the exact words as an author or paraphrasing large segments of writing. Read the information and explain it in your own words. Do not cite Canvas material, lecture notes, manuals, or TAs. Please use the format given to you by your TA when citing textbooks and journal articles in your reports. For instance, if your TA asks you to use APS (American Physiological Society) formatting, be sure to locate a credible source that can guide you with the citation process. To monitor proper use of citations and uphold a high standard of academic integrity, written assignments are checked with software to detect plagiarism.

Academic Integrity Policy:

<http://academicintegrity.rutgers.edu/academic-integrity-policy>

STUDENT SUPPORT AND MENTAL WELLNESS

Rutgers resources to support academic success and mental wellness.

- Student Success Essentials: <https://success.rutgers.edu>
- Student Support Services: <https://www.rutgers.edu/academics/student-support>
- The Learning Centers: <https://rlc.rutgers.edu/>
- The Writing Centers (including Tutoring and Writing Coaching): <https://writingctr.rutgers.edu>
- Rutgers Libraries: <https://www.libraries.rutgers.edu/>
- Office of Veteran and Military Programs and Services: <https://veterans.rutgers.edu>
- Student Health Services: <http://health.rutgers.edu/>
- Counseling, Alcohol and Other Drug Assistance Program & Psychiatric Services (CAPS):
<http://health.rutgers.edu/medical-counseling-services/counseling/>
- Office for Violence Prevention and Victim Assistance: www.vpva.rutgers.edu/