

Course Information:

Integrated Physiology (11:067:300)

Spring 2020

4 Credits

Lecture: Tuesdays and Thursdays 12:35-1:55pm

Recitation: Fridays 12:35-1:55pm

Location: Food Science Auditorium

Instructors:

Coordinator and Instructor: Anna Hausmann, DVM ; anna.hausmann@rutgers.edu

Instructor: Kenneth H. McKeever, Ph.D ; mckeever@sebs.rutgers.edu

Recitation/Laboratory: Anna Hausmann, DVM ; anna.hausmann@rutgers.edu

Dr. Hausmann's Office Hours and Office Location: Tuesdays 3:30-5pm, Wednesdays 12:30-2pm, or by appointment, office located in Bartlett Hall 213D

Course Description:

This is a lecture-based physiology course. It covers topics in cellular and molecular physiology and challenges the students to problem solve in order to understand the integration of bodily functions. The objective of the course is to construct a comprehensive approach to the body, its systems, and the many processes that keep the organism functioning. Additional instruction is given through assigned lab reports, which are due **before** and reviewed during recitations sessions. Students requiring further assistance can visit the instructor(s) during office hours or by appointment. Prerequisites for this class include General Biology 01:119: 101-102 and General Chemistry 01:160:161-162, 171.

Program Learning Goals:

By the completion of this course you will have become familiar with the basic principles of physiology, including concepts related to homeostasis and control of integrative systems. During the course the students will:

1. Develop a thorough understanding of the principle of homeostasis and controls of mammalian physiology (PLG 2 & 3)
Assessment: Exams, weekly quizzes, and lab reports
2. Develop a basic understanding of skeletal and cardiac muscle physiology and regulatory controls (PLG 2 & 3)
Assessment: Exams, quizzes, and lab reports
3. Understand the autonomic nervous system regulation of homeostasis and response to physiological challenges (PLG 2 & 3)
Assessment: Exams, quizzes, and lab reports
4. Understand the central nervous system, cardiac, and renal regulation of fluid balance and blood pressure control (PLG 2 & 3)
Assessment: Exams, quizzes, and lab reports
5. Critically apply physiological concepts to understand and interpret basic laboratory findings and critical thinking (PLG 2 & 3)

Assessment: Exams, quizzes and lab reports

Textbook:

Lecture: Derrickson B, Human Physiology, 2nd edition (eText) through Rutgers Canvas (<https://canvas.rutgers.edu/>)

Laboratory: PowerPhys, module accompanying purchase of Derrickson B, Human Physiology through Rutgers Canvas (<https://canvas.rutgers.edu/>)

Lecture Periods:

Concepts will be covered in a lecture/discussion format, reinforced by the students' independent reading and laboratory simulations. Four lecture exams will be given, falling at the conclusion of a unit of material. However, each exam is cumulative as physiologic concepts build upon each other. Exams will draw from both lectures and the text. Exams emphasize understanding and interpretation of the material. The format of the exams will be multiple choice. Tentative exam dates are shown on the course outline (below). Each exam will count for 18.75% of your final grade of the class. There are no make-up exams. Exam dates conflicts are to be discussed with the instructor **before** the scheduled date. In addition, a request for re-scheduling an exam will be sent to the Dean of Students, **Dr. Michelle Jefferson** (jeffermi@echo.rutgers.edu) for review. Failure to do so will result in a grade of "F" for any missed exam.

Recitation:

Weekly laboratory assignments and important topics will be reviewed during recitation. Laboratory reports will be submitted through the Canvas site (see below) **BEFORE** the start of class. You will be allowed to drop/miss **one** lab report per semester. The average of nine lab report grades will count for 10% of your final grade of the class. A quiz will be administered during each recitation on weeks when there are no exams. Quiz material will be material from the preceding weeks' recitation and laboratory assignment to emphasize important physiological concepts. The format of the quizzes will be multiple choice, short answer, essay, and critical thinking questions. There are no make-up quizzes. Potential conflicts are to be discussed with the instructor before the scheduled date. Failure to do so will result in a grade of "F" for any missed quiz. You will be allowed to drop/miss **one** quiz per semester. The average of nine recitation quiz grades will count for 15% of your final grade of the class.

Grading Policy:

Science courses at Rutgers integrate scientific content with mathematical, written and oral skills, problem solving and critical thinking. Assessment of these skills includes lecture exams and recitation quizzes.

Grades will be calculated as follows:

4 Lecture Exams	75%
9 Quizzes	15%
Lab Reports	10%

Letter grades will be calculated as follows:

A = 90% or above, B+= 85% - 89%, B = 80% - 84%, C+= 75% - 79%, C = 70% - 74%, D = 60% - 69%, F = less than 60%

Attendance Policy:

Successful completion of the course objectives will be extremely unlikely without excellent attendance. Students are expected to attend ALL classes except in cases of emergency (e.g. illness, death in family), religious holidays (observance of which requires restriction of daily activity), or participation in an official college function (professional school interviews, etc.). In these cases, notification or verification is requested. In the case of absence for special reasons other than those already mentioned, it is the student's responsibility to confer with the instructor about whether the absence is considered excused. When determining whether an absence is excused, the instructor may require such evidence as seems appropriate. As such, attendance is mandatory. If you do miss class, it is **your** responsibility to catch up with work missed.

HOW TO POSITION YOURSELF FOR ACADEMIC SUCCESS:

Tips for improving your chances for success in Integrative Physiology:

1. Come to Lecture and Recitation – People learn in many ways, some are auditory learners, some visual learners, some tactile, but most of us use a combination of all of these, which I will try to do in class as well. Hence, attending lecture and lab increases your opportunities for learning.
2. Note Taking Techniques – Taking notes in class in outline form and leaving space on the page to 'fill in' from the text is highly recommended. Reading over your notes within 24 hours after class and supplementing with more detail from the text will greatly enhance your retention of the material. I would suggest taking lecture notes in one color and using contrasting color for 'added' material.
3. Keep up with the material – Learn the vocabulary and study them regularly. Do not wait until the day before the exam to find out you do not understand something. There is sometimes a tendency to go into a studying slump after mid-semester. Just like in a race, do not let up until the finish line and try to save your best kick for the end of the race!
4. Read the text – Lectures will not always cover all the material so your text is an important resource. Focus on the summary charts, bold or highlighted items, and end of chapter reviews. Supplement your lecture notes with points from your readings. The text provides a wealth of visual illustrations and additional web based resources. Utilize all of these resources to help you learn.
5. Do your laboratory report – You can expect to see question similar to your lab report appear on the quizzes and exam.
6. Form study groups – Study groups can help you learn while making new friends. Often students can learn as much from their peers as from the professor. When you can explain a concept to someone else then you know that you really know it!
7. Ask for help – Students ARE NOT an interruption from my work, but the reason for it. Visit me during office hours or make an appointment. Sometimes that extra bit of explanation makes all the difference.

Integrative Physiology 300 (Spring 2020)

Date:	Lecture:	Topic:	Textbook:	Recitation:
Jan 21	1	An Introduction to Physiology, Chemical Composition of the Body, and Cells (<i>Hausmann</i>)	Chapters 1-3	
Jan 23	2	Metabolism (<i>Hausmann</i>)	Chapter 4	
Jan 24	Rec	Introduction to Lab	N/A	Overview of simulations
Jan 28	3	Transport Across the Plasma Membrane (<i>Hausmann</i>)	Chapter 5	
Jan 30	4	Cell Signaling (<i>Hausmann</i>)	Chapter 6	
Jan 31	Rec	PowerPhys: 1. Enzyme Activity QUIZ #1	N/A	Lab Report #1: Enzyme Activity due by 12:34pm
Feb 4	5	Review Exam 1 (<i>Hausmann</i>)	Chapters 1-6	
Feb 6	6	The Nervous System and Neuronal Excitability (<i>Hausmann</i>)	Chapter 7	
Feb 7	Rec	EXAM 1	Chapters 1-6	Exam 1 (Chapters 1-6)
Feb 11	7	The Central Nervous System (<i>Hausmann</i>)	Chapter 8	
Feb 13	8	Sensory Systems (<i>Hausmann</i>)	Chapter 9	
Feb 14	Rec	PowerPhys: 4. Action Potentials QUIZ #2	N/A	Lab Report #2: Action Potentials due by 12:34pm
Feb 18	9	Autonomic and Somatic Nervous Systems (<i>Hausmann</i>)	Chapter 10	
Feb 20	10	The Endocrine System (<i>Hausmann</i>)	Chapter 13	
Feb 21	Rec	PowerPhys: 11. Homeostatic Imbalances of Thyroid Function QUIZ #3	N/A	Lab Report #3: Homeostatic Imbalances of Thyroid Function due by 12:34pm
Feb 25	11	The Immune System (<i>Hausmann</i>)	Chapter 17	
Feb 27	12	Review Exam 2 (<i>Hausmann</i>)	Chapters 7-10, 13, and 17	
Feb 28	Rec	PowerPhys: 3. Recruitment and Isotonic and Isometric Contractions QUIZ #4	N/A	Lab Report #4: Recruitment and Isotonic and Isometric Contractions due by 12:34pm
Mar 3	13	Muscles (<i>McKeever</i>)	Chapter 11	
Mar 5	14	Control of Body Movement (<i>McKeever</i>)	Chapter 12	
Mar 6	Rec	EXAM 2	Chapters 7-10, 13, and 17	Exam 2 (Chapters 7-10, 13, and 17)

Mar 10	15	The Cardiovascular System: The Heart (<i>McKeever</i>)	Chapter 14	
Mar 12	16	The Cardiovascular System: Blood Vessels and Hemodynamics (<i>McKeever</i>)	Chapter 15	
Mar 13	Rec	PowerPhys: 2. Twitch Contractions and Summation QUIZ #5	N/A	Lab Report #5: Twitch Contractions and Summation due by 12:34pm
Mar 24	17	The Cardiovascular System: The Blood (<i>McKeever</i>)	Chapter 16	
Mar 26	18	The Respiratory System (<i>McKeever</i>)	Chapters 18	
Mar 27	Rec	PowerPhys: 6. Effect of Exercise on Cardiac Output QUIZ #6	N/A	Lab Report #6: Effect of Exercise on Cardiac Output due by 12:34pm
Mar 31	19	Review Exam 3 (<i>McKeever</i>)	Chapters 11-12, 14-16, 18	
Apr 2	20	The Urinary System (<i>McKeever</i>)	Chapter 19	
Apr 3	Rec	EXAM 3	Chapters 11-12, 14-16, 18	Exam 3 (Chapters 11-12, 14-16, 18)
Apr 7	21	The Urinary System (<i>McKeever</i>)	Chapter 19	
Apr 9	22	Fluid, Electrolyte, and Acid-Base Homeostasis (<i>McKeever</i>)	Chapters 20	
Apr 10	Rec	PowerPhys: 12. Hematocrit and Hemoglobin Concentration and Blood Typing QUIZ #7	N/A	Lab Report #7: Hematocrit and Hemoglobin Concentration and Blood Typing due by 12:34pm
Apr 14	23	Fluid, Electrolyte, and Acid-Base Homeostasis (<i>McKeever</i>)	Chapters 20	
Apr 16	24	Metabolic Adaptations, Energy Balance, and Temperature Regulation (<i>McKeever</i>)	Chapter 22	
Apr 17	Rec	PowerPhys: 8. Respiratory Volumes QUIZ #8	N/A	Lab Report #8: Respiratory Volumes due by 12:34pm
Apr 21	25	The Digestive System (<i>Hausmann</i>)	Chapter 21	
Apr 23	26	The Reproductive Systems (<i>Hausmann</i>)	Chapter 23	
Apr 24	Rec	PowerPhys: 10. Influence of Urine Intake on Urine Formation QUIZ #9	N/A	Lab Report #9: Influence of Urine Intake on Urine Formation due by 12:34pm
Apr 28	27	The Reproductive Systems (<i>Hausmann</i>)	Chapter 23	
Apr 30	28	Review for Exam 4 (<i>Hausmann</i> , <i>McKeever</i>)	Chapters 19-23	

May 1	Rec	PowerPhys: 5. Blood Glucose Regulation QUIZ #10	N/A	Lab Report #10: Blood Glucose Regulation due by 12:34pm
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***Exam 4 (Chapters 19-23)** will be administered during final's week, final's week schedule TBA*

Disability Services

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all the University's educational programs. To receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation:

<https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with me and discuss the accommodations *as early in this course as possible*. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

ACADEMIC INTEGRITY

The university's policy on Academic Integrity is available at:

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

The principles of academic integrity require that a student:

- properly acknowledge and cite all use of the ideas, results, or words of others.
- properly acknowledge all contributors to a given piece of work.
- make sure that all work submitted as his or her own in a course or other academic activity is produced without the aid of impermissible materials or impermissible collaboration.
- obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- uphold the canons of the ethical or professional code of the profession for which he or she is preparing.

Adherence to these principles is necessary in order to ensure that

- everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- all student work is fairly evaluated and no student has an inappropriate advantage over others.
- the academic and ethical development of all students is fostered.
- the reputation of the University for integrity in its teaching, research, and scholarship is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.

STUDENT WELLNESS SERVICES

Just In Case Web App <http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901 / www.rhscaps.rutgers.edu/

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff, and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-9321181.

Scarlet Listeners

(732) 247-5555 / <http://www.scarletlisteners.com/>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.