PHPY 5005Q - Fundamental of Human Physiology Course Syllabus
Spring 2024

COURSE DESCRIPTION:

This course will provide students with an understanding of: (1) general physiological principles (i.e. body organization, cellular communication, neural and hormonal control, function of individual cells), (2) regulation and function of major body systems (cardiovascular, respiratory, renal, gastrointestinal and endocrine) and (3) the integration of these systems in the maintenance of homeostasis of the human body. The concepts presented in this course are intended to provide students with the knowledge of the major physiological processes needed to understand basic biomedical research and the diagnosis of human disease.

COURSE OBJECTIVES:

Upon completion of the course, each student will be able to:

- Describe the functional organization of the human body and the control of homeostasis.
- Identify the functional compartments of the body and the role of the cell membrane in the maintenance of normal ion concentrations, molecules, and hormone levels in the blood.
- Characterize the membrane-transport mechanisms of the cell and their role in the generation of action potentials, the maintenance of osmolarity/tonicity of the cell and the transport of molecules between the intracellular and extracellular environment.
- Classify, differentiate, and describe the underlying mechanisms of skeletal, cardiac, and smooth muscle contraction.
- Identify the various mechanisms of muscle contraction and how they allow for normal and adaptive function of the muscle tissues (i.e. the role of the neuromuscular junction, modulation of cardiac contractility, gastrointestinal and vascular function via the contraction and dilation of smooth muscle).
- Describe the general biophysical properties of the circulation, as it relates to pressure, flow, and resistance.
- Explain the origin and propagation of cardiac action potentials and their relationship to the electrical activity of the heart.
- Demonstrate an understanding of the principles of cardiac function in health and disease (as it relates to cardiac output and the perfusion needs of the body tissues).
- Describe the relationship between the pulmonary anatomy and pulmonary mechanics, in relationship to the lung ventilation and perfusion.
- Explain the physical principles of gas exchange for oxygen and carbon dioxide as they relate to the respiratory system through cellular membranes.
- Describe how the kidneys regulate body fluids and the removal of wastes from the body.
- Identify the role of the kidneys in the regulation of blood pressure and endocrine functions.
- Recognize the role of the renal and respiratory systems on acid-base balance of the body.
- Identify the key principles of the gastrointestinal system (i.e. motility, secretion and absorption) involved in the transfer of food from the external environment to the absorption of nutrients in the internal environment.
- Identify and describe the underlying mechanisms for protein, carbohydrate, and lipid metabolism.

- Explain the mechanisms which regulate the secretion and signaling of chemical messengers in the endocrine system, as well as the variations in chemical structure and synthesis of these hormones.
- Understand the actions of key endocrine hormones involved in the maintenance of whole-body homeostasis.
- Classify and describe the anterior and posterior pituitary hormones and their control by the hypothalamic neurons.
- Comprehend and explain the interrelationships between insulin, glucagon, and other hormones in the regulation of blood glucose.
- Identify the endocrine hormones involved in the control of metabolic rate, growth and developmental processes and the secretory activity of other endocrine glands.

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COURSE FORMAT:

This course is a lecture-based course. Some **lectures will be offered as a flipped classroom or virtual lecture, while others will have in-person and remote options.** For the lectures with the in-person options, you can attend lecture in MSB B554/C554. Please note the room change.

Please see the detailed course schedule for specific details of the lecture. Attendance at lectures is **VOLUNTARY**. However, students who attend class in-person usually perform better in the course.

Note: All lectures will be recorded and made available to the students on the Canvas course website or through the Yuja link.

FACULTY AND STAFF:

The course is presented by the Department of Pharmacology, Physiology and Neuroscience. Dr. Andrew Thomas is chairman of the Department. The course directors are Drs. Larry Gaspers and Patricio Mujica. The contact information for the course faculty is listed below. A student seeking individual assistance in any matter relating to the course content is encouraged to make an appointment with the appropriate faculty member. **All administrative and grading concerns should be directed to one of the course directors.**

FACULTY	DEPARTMENT	OFFICE	EXTENSION	E-MAIL ADDRESS
Dr. Lawrence Gaspers	Co-course Director Dept. of Pharmacology, Physiology and Neuroscience	MSB H651	2-5379	larry.gaspers@rutgers.edu
Dr. Patricio Mujica	Co-course Director Dept. of Pharmacology, Physiology and Neuroscience	MSB H655		mujicape@njms.rutgers.edu
Dr. Krista Blackwell	Dept. of Pharmacology, Physiology and Neuroscience			blackwkn@njms.rutgers.edu kb146@greenvillemed.sc.edu
Dr. Ronaldo Ferraris	Dept. of Pharmacology, Physiology and Neuroscience	MSB H621	2- 4519	ferraris@njms.rutgers.edu
Dr. Tibor Rohacs	Dept. of Pharmacology, Physiology and Neuroscience	MSB H631	2-4464	rohacsti@njms.rutgers.edu
Alejandro Alcaide	Teaching Assistant	N/A		aa1579@gsbs.rutgers.edu
James Thornton	Teaching Assistant	N/A		jt1165@gsbs.rutgers.edu

COURSE TEXTBOOKS:

There is **NO REQUIRED** textbook for the course. Many of the lectures are based on chapters from different resources. Therefore, the **RECOMMENDED TEXTBOOK** for the course is: Physiology: Linda S. Costanzo, 7th edition (2022). The textbook is available online through the George F Smith Library:

https://www-clinicalkey-com.proxy.libraries.rutgers.edu/#!/browse/book/3-s2.0-C20190054726

All textbooks will be made available through the Reading List section on the Canvas course website.

Note: the reading list also contains textbooks with additional self-assessment questions.

EVALUATION METHODS & COURSE GRADING

Assessment/Evaluation:

ALL COURSE QUIZZES AND EXAMS WILL BE ADMINISTERED REMOTELY AND IN-PERSON THROUGH THE EXAMSOFT/EXAMPLIFY SOFTWARE. Additional information regarding ExamSoft system requirements and remote exams are available in the course syllabus.

Quizzes: There will be one quiz for each of the areas covered in the human physiology course. There are a total of 6 quizzes administered in the course, but the best 5 quizzes will be used to determine the average quiz score. Each quiz will be the equivalent to 6% of the total weighted average (30% of the total course grade). These quizzes may be short answer, calculations or multiple-choice format.

Midterm and Final Exams: These exams are multiple-choice examinations based on material presented in the lectures and textbook readings. For the midterm and final exam, each exam will be equivalent to 35% of the total weighted average.

Estimation of Weighted Course Average

Exam/Quizzes	**Weight (%)**
Midterm Exam	35%
Final Exam	35%
Quizzes (5)	30% (6% per quiz)
Total	**100%**

Course Grading:

Final grades are assigned based on the student's course average where:

A grade of **A** will be assigned for a course average > 90.00%.

A grade of **B+** will be assigned for a course average > 80.00%.

A grade of **B** will be assigned for a course average >70.00%.

A grade of **C+** will be assigned for a course average > 65.00%.

A grade of **C** will be assigned for a course average > 60.00%.

Any student, whose course average falls below the C grade level, will receive a grade of F in the course.

EDUCATION PORTAL AND CANVAS COURSE ACCESS:

The CANVAS course website is an essential part of the Fundamentals of Human Physiology Course. CANVAS can be accessed using the Educational Portal website at https://ep.njms.rutgers.edu. The Education Portal provides single sign-on and "one stop shopping" site for various academic systems such as CANVAS, Education Management System, Digital Media Portal, Virtual Microscopy, SOCRATES, etc.

If the Education Portal is unavailable, direct links for CANVAS, NJMS Video, Virtual Microscopy etc., are provided below:

CANVAS: To access all course information log onto CANVAS at: https://canvas.rutgers.edu/

PODCAST ACCESS: Podcasts will be made available on the Canvas course website or through YuJa media platform. The YuJa media platform is accessible at: https://njms-rutgers.yuja.com/P/VideoManagement/MediaLibrary/InstitutionPrivateChannel/AllStudents/72d6213a-e18f-41d4-bbb9-7b0f42c57421. Log in with your core credentials (NetID and Password). This will open the SGS folder. The folder with the course number will need to be selected to view the lecture recordings.

GRADEBOOK AND COURSE EVALUATION:

Course Grades: Once finalized, course quiz and exam grades will be added to the Canvas gradebook. Please use this gradebook to monitor your grades and performance for this course.

Course Evaluations: Final course evaluations must be completed on the Education Management System (EMS) before you can receive your final course grade and letter grade.

1. https://ep.njms.rutgers.edu/
2. Login (top right) and then select EMS link.
3. Click on the course and select "To Do Evaluations".
4. Click on the evaluation form and then "start". Complete the evaluation and submit.
5. To access your grade, click on "Grades" from the course section. Your grade will be posted when the instructor has released them.

WIRELESS ACCESS FOR ELECTRONIC EXAMS (ON CAMPUS EXAMS)

RU Health Sciences is the primary wireless network for SGS however you can use either RU Health Sciences or RU Wireless Secure for electronic exams. Please make sure you can connect to both prior to exam. See https://ruwireless.rutgers.edu/ruwireless-secure for more information. **DO NOT USE RU Wireless.**

EXAMSOFT SYSTEM REQUIREMENTS:

The following laptop requirements are necessary for the School of Graduate Studies

<table>
<tr><th colspan="2">REQUIREMENTS</th></tr>
<tr><th>Windows</th><th>Mac OS</th></tr>
<tr><td>• English 64-bit OS versions of Windows 10 (20H2, 21H1, 21H2) and 11 (21H2)
• Windows RT, Windows 10 and 11S, are NOT supported at this time.
• 1GHz Intel (non-ARM) processors or higher
• RAM: 4 GB or higher
• HD (needs at least 1 GB of free space)
• 13’ screen or larger (Laptops)
• Minimum screen resolution of 1280x768
• Virtual machines & applications are not allowed
• Surface Pro is allowed (running W10 or W11 * NOT in S mode * and non-pro Surface devices are not allowed)
• Tablets are not allowed; nor Chromebooks, netbooks, etc.
• For on-site support, a working USB port is required (newer devices may require an adaptor)</td><td>• v10.15 (Catalina), v11 (Big Sur), v12 (Monterey), v13 (Ventura)
• Any server version of Mac OS is NOT supported
• CPU: Intel or M1 processor.
• RAM: 4 GB or higher
• HD (needs at least 1 GB of free space)
• 13’ screen or larger (Laptops)
• Minimum screen resolution of 1280x768
• Virtual machines & applications are not allowed.
• iPads/tablets are not allowed
• For on-site support, a working USB port is required (newer devices may require an adaptor)</td></tr>
<tr><td>• Microsoft Edge
• Chrome
• Firefox
• Do not use beta versions. Other browsers are not supported.</td><td>• Safari
• Chrome
• Firefox
• Do not use beta versions. Other browsers are not supported.</td></tr>
<tr><td>Browser Settings
- JavaScript Enabled
- Cookies Enabled
- CSS Enabled
- Disable pop-up blockers</td><td>Browser Settings
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- Cookies Enabled
- CSS Enabled
- Disable pop-up blockers</td></tr>
<tr><td colspan="2">Must have Administrator level account permissions.</td></tr>
<tr><td colspan="2">Disable Toolbars, Adware or Spyware programs. They may adversely affect the computer’s performance and cause delays in loading testing questions.</td></tr>
<tr><td colspan="2">If you are using McAfee, you need to turn off Real-Time Scanning.</td></tr>
<tr><td colspan="2">Turn off Windows updates or virus scanner updates to avoid interruptions during testing.</td></tr>
<tr><td colspan="2">****<u>The following requirements apply for exams with ExamID or ExamMonitor enabled</u>
• Examplify version 2.3.2 or greater
• Hard Drive: 2GB or higher available space
• RAM: 8GB or higher recommended; 4GB required
• Webcam
• Microphone (no headphones!)
• Internet: 2Mpbs upload speed</td></tr>
</table>

EXAMSOFT EXAMPLIFY LINKS:

Minimum System Requirements PC and Mac

https://examsoft.com/resources/examplify-minimum-system-requirements/

Examplify for Windows and Mac

https://support.examsoft.com/hc/en-us/articles/11167619287821-Examplify-for-Windows-and-Mac-Download-Install-and-Register-Examplify

ABSENCE FROM COURSE QUIZZES AND EXAMS:

SGS has issued a **MISSED EXAM POLICY** for students enrolled in their programs. Below are the valid excuses for missing a quiz or exam in this course (verbatim from the SGS Exam Policy):

1) Significant illness, with official note by doctor, which must include a valid reason for missing the exam. NOTE: Illness prior to the exam ("didn't have time to study") does not constitute a valid excuse, although exceptions can be given by the SGS Associate Dean of Student Affairs if the prior illness has been severe or lengthy.
2) Death in the immediate family (parents, siblings, children, grandparents, aunts/uncles, niece or nephew, sister-in-law or brother-in-law, parents-in-law, first-cousins). Verification, with dates, is required, but this can be a newspaper announcement, event (e.g. wake) announcement, etc.
3) Medical/dental school interview, in which the interview or unavoidable travel overlaps with the exam. Copy of the invitation letter.
4) Presentation at a meeting. Proof of attendance is required.
5) More than two final exams on the same day. (NOTE: An exam should not be rescheduled for an individual with two exams on the same day). If a student has more than two exams on the same day, they will need to contact the SGS Associate Dean of Student Affairs, who will contact the course directors about allowing the student to take one of the exams on a different day. The vast majority of schools across the country, including Rutgers New Brunswick, allow up to two final exam in the same day.
6) Permission of SGS Associate Dean of Students Affairs, with consultation of course-director. This will be rare, but is meant to account for valid, but unforeseen circumstances.

Each of these reasons will require some form of documentation to be submitted to verify the absence. For the full policy, please follow this link:
http://njms.rutgers.edu/sgs/current_students/docs/new/ExamPolicy.pdf

CODE OF PROFESSIONAL CONDUCT (COURSE EXAMINATIONS):

All students have a fundamental responsibility for maintaining academic integrity and intellectual honesty in their academic and professional endeavors. They are expected to observe generally accepted principles of scholarly work, to submit their own rather than another's work, to refrain from falsifying data, to acknowledge the published work of others in an appropriate manner, and to refrain from receiving or giving aid during examinations or other work requiring independent effort. When submitting written material, students take full responsibility for the originality of all work not otherwise identified by appropriate acknowledgments and imply that both the ideas and words used are their own. All students are expected to respect the property of faculty and other students, and not use research equipment or laboratory supplies of others without permission.

Specific examples of appropriate behavior in examinations exams are given below

Examinations: The purpose of an examination is to assess a student's knowledge of a topic defined within a course or courses. **Unless given explicit written instructions to the contrary, a student must work without assistance on an examination.**

- **Classroom examination:** Each student will provide answers to questions as directed. Unless otherwise stated, no material (books, calculators, computers, communication devices) of any kind can be used during an examination.
- **Take-home examination:** Each student will provide answers as directed. Unless otherwise stated, research and writing must be done individually without assistance or exchange of information with others. The ability to use source material in the research of answers will be defined for each examination. But, unless stated otherwise, all source material should be cited appropriately as outlined below.

NOTE: THESE POLICIES ALSO HOLD TRUE FOR ALL EXAMS ADMINISTERED REMOTELY.

To view the full policy for the Code of Professional Conduct in the School of Graduate studies regarding examinations, research and oral presentations follow this link:
http://njms.rutgers.edu/sgs/current_students/ac_integ.php

ACADEMIC WARNING POLICY:

http://njms.rutgers.edu/sgs/documents/policys/SGS_Academic_Warning_Policy.pdf

Each program shall clearly inform students of the criteria for satisfactory academic performance. Academic standing will be reviewed each semester by the Program's Academic Standing Committee. Students who receive less than an average grade of "B" in the designated Core course(s) or have a GPA less than 3.0 will receive an academic warning notice. Students performing below satisfactory levels of proficiency as outlined by the program may also receive a written warning notice. The written warning states the problem(s), outlines those measures needed for improvement and sets a deadline for compliance. Letters informing students of an academic warning will be sent within 30 calendar days of the end of the semester. A request will be made to students receiving academic warning letters to meet with the Program Director and/or the Academic Standing Committee.

COURSE ADD/DROP POLICY:

Policy for the Addition of a Course:

Students may add courses with the approval of the instructor (when required) and the program director. A student wishing to add a course after the general registration period has closed, must complete the "Add/Drop/Withdraw" form and have appropriate approval of the course instructor (when required and program director prior to the start of the course. Registration will not be permitted beyond the first week of a course. Credit will not be given for courses in which the student was not registered.

Add Course Form Link:
https://na2.docusign.net/Member/PowerFormSigning.aspx?PowerFormId=96fcae95-bc67-45fb-8da3-11300ded2e99

Policy for Dropping a Course:

Students may drop courses with approval of the instructor (when required) and the program director. Students submitting a completed "Add/Drop/withdraw" form to the SGS Registrar's office within 10 academic days of the start of the course will receive a full tuition refund and the course will not appear on their official transcript. The drop period of 1-10 *academic days, is distinguishable from the withdrawal period in that the drop period is without penalty. A completed and approved Add/Drop/Withdraw" form(s) must be received by the Registrar's office within the time periods set forth above in order for a course(s) to be "dropped".

Drop Course Form Link:
https://na2.docusign.net/Member/PowerFormSigning.aspx?PowerFormId=c45635ca-6a1e-4936-b436-337b211b8433

***An academic day is defined as a day that the SGS campus at which the student is enrolled is open for business.**

REASONABLE ACCOMMODATIONS AT RUTGERS SCHOOL OF GRADUATE STUDIES:

Rutgers School of Graduate Studies is committed to providing equitable access to learning opportunities to students with documented disabilities (e.g. mental health, attentional, learning, chronic health, sensory, or physical). To ensure access to this please contact Student Affairs, to engage in a confidential conversation about the process for requesting reasonable accommodations in the classroom setting. Students are encouraged to register with the Office of Student Affairs as soon as they begin their program. Accommodations are not provided retroactively. Rutgers School of Graduate Studies encourages students to access all resources available through the School for consistent support and access to their program.

More information can be found online at

http://njms.rutgers.edu/education/student_affairs/student_support/disability_services.cfm

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must complete the ODS registration form: https://webapps.rutgers.edu/student-ods/forms/registration and contact the RBHS Office of Disability Services at 973-972-5396 or cindy.poorepariseau@rutgers.edu to make an appointment for an intake interview. You will also be asked to provide documentation of your disability:

https://ods.rutgers.edu/students/documentation-guidelines .

If the documentation supports your request for reasonable accommodations, the Office of Disability Services will provide you with a Letter of Accommodations. This Letter will be used to notify appropriate school personnel about the accommodations you are qualified to receive. To begin this process, please complete the Registration form on the ODS web site at: https://webapps.rutgers.edu/student-ods/forms/registration .