UF College of Medicine
Department of Pharmacology and Therapeutics
UNIVERSITY of FLORIDA

GMS 6552
Cell Signaling and Therapeutics

Classroom: Online via
http://elearning.ufl.edu

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There are no set office hours for this online course, to best accommodate asynchronous learning. If you have questions about the material or the course, please contact one of the above individuals using E-Learning.

COURSE DESCRIPTION

This two-credit course is for basic and clinical scientists and others that wish to gain knowledge of the signaling mechanisms that exist in human cells. These mechanisms are the source of many new drug targets and understanding their biology is critical for the development of new therapeutics and an advanced understanding of current treatment options.

Topics to be discussed, among others, include G-protein coupled receptors, NF-κB, receptor tyrosine kinases, TGF-β, mTORC, apoptosis, and ion channels.

Concepts are taught using a combination of online lectures and online problem sets. The problem sets are designed to help the student reinforce and understand these fundamental concepts. The ultimate goal is for students to develop an understanding of the core principals of medical pharmacology and therapeutics, as well as the problem solving and critical thinking skills, necessary to study pharmacology and therapeutics in the context of human disease.

PREREQUISITES

This course requires a BA or BS and a strong science foundation with at least 5 full semester courses related to biology, chemistry and/or physics.

LEARNING RESOURCES

1. Recorded video lectures with PowerPoint presentations will be provided in E-Learning.

2. Lecture notes for each video lecture are available as PDF downloads in E-Learning.

3. While not required, recommended texts to accompany the online content are:

   Goodman and Gilman's The Pharmacological Basis of Therapeutics

   Basic & Clinical Pharmacology by Katzung

   These books are available online at no cost to UF students through the UF Health Science Center Library:

https://uflib.ufl.edu/using-the-libraries/off-campus-access/ .

LEARNING OUTCOMES

Successful completion of this course will prepare students to study pharmacology and therapeutics in the context of translational research and specific human physiologies and pathophysiologies. These students will be able to:

1. Understand the biochemical mechanisms that function to allow signaling within human cells.

2. Integrate knowledge of biochemical mechanisms to recognize their impact on drug discovery, development, and therapeutic use.

3. Demonstrate the ability to apply pharmacological principles of clinical and basic science relevancy by multiple choice examinations, written answer examinations, and homework exercises.

GRADING SCALE

A numerical grade will be given at the end of the course and will be scored as follows, per University of Florida standards (https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx):

92-100% = A
90-91% = A-
87-89% = B+
82-86% = B
80-81% = B-
77-79% = C+
72-76% = C
70-71% = C-
67-69% = D+
62-66% = D
60-61% = D-
<60% = E

FINAL GRADE CALCULATION

Your final grade will be calculated as below:

20% Problem Sets
30% Review Exams
30% Lecture Exams
20% Cumulative Final Exam

1. Problem Sets: 20%

a. The course content is structured into groups of lectures that are accompanied by problem sets.
b. Problem sets may require basic calculations or interpretations of data figures describing the action of drugs or other therapeutic agents along with testing general comprehension.

c. They are open book.
d. Each problem set has its own due date, which is available in E-Learning.
e. Points will be spread evenly over all questions for the entire semester.

2. Review Exams: 30%

a. There will be two exams that will test mastery of the questions from the problem sets.
b. All questions will be taken directly from the problem sets.
c. Students should expect to see every question from the problem sets, other than the short answer questions, on this exam.
d. Points will be spread evenly over all questions from both exams.
e. These exams must be proctored by ProctorU.

3. Lecture Exams: 30%

a. There are two lecture exams.
b. These exams are primarily short-answer and essay questions.
c. Each exam will cover material from one half of the semester.
d. The exams may be taken any time during their window of availability; however, each can only be taken once.
e. You must set up online proctoring for each exam as described in the following section.
f. If you are in the process of taking an exam when the scheduling window closes, it will automatically submit and you will not be allowed to complete the rest of the exam.
g. Each exam is worth 15% of your final grade.

4. Final Exam: 20%

a. There will be one cumulative exam covering the material taught in all of the lectures.
b. This exam will be multiple choice.
c. The exam may be taken any time during the window of availability; however, it can only be taken once.
d. You must set up online proctoring for this exam as described in the following section.
e. If you are in the process of taking the exam when the scheduling window closes, it will automatically submit and you will not be allowed to complete the rest of the exam.

EXAM PROCTORING

The exam will be monitored by ProctorU, a UF chosen service that allows the students to complete their exams at home while still ensuring academic integrity. Students will make the arrangements for exam proctoring. But all standard costs of the exam are covered in the registration costs. Last-minute appointments with ProctorU to take the exam may incur extra costs that are the responsibility of the student.

ProctorU is a live online proctoring service that allows you to take your exam from the comfort of your home. ProctorU is available 24/7, however, you will need to schedule your proctoring session at least 72 hours in advance to avoid any on-demand scheduling fees. Creating a ProctorU account is simple. You can do so by visiting go.proctoru.com.

In order to use ProctorU, you will need a high-speed internet connection, a webcam (internal or external), a windows or apple operating system, and a government issued photo id. ProctorU recommends that you visit https://test-it-out.proctoru.com/ prior to your proctoring session to test your equipment. We recommend you click on the button that says “connect to a live person” to fully test out your equipment.

Additionally, please visit and review the test-taker resource center here. You should expect the startup process with the proctor to take about 10-15 minutes. However, this time will not affect your exam time. Please feel free to direct any questions to the student support team via the live chat within your account.

Be sure to check the proctoring conditions/rules for each exam. These include, but are not limited to:

- Students may not have or use *any* resources during the exam
- Calculators are not allowed
- Exams must be taken in a private location.
- Students must keep their eyes on their screen. Since no resources are allowed, looking offscreen will be interpreted as cheating.

Failure to follow test taking conditions, ProctorU conditions, or proctor instructions will result in the loss of online proctoring privileges. In that case, exams will need to be proctored in-person at a testing center, possibly at the student's expense.

MAKE-UP AND LATE POLICY

There are no make-up exams allowed unless otherwise granted by the course coordinator prior to an examination date. Failure to take an exam without prior permission from the course coordinator will be recorded as 0.

All other assignments may be completed late up until final grades are posted. A penalty of 0.2% per hour will be applied to each late assignment unless due to an excused absence, as defined by UF policy https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/. At no point shall an assignment be worth less than 50% of its original value. In the event of an excused absence, the student must work with the instructor to turn in work as soon as feasible.

ACADEMIC HONESTY

Please review the complete policy of the University of Florida regarding academic dishonesty, found in the online student handbook at: http://graduateschool.ufl.edu/media/graduate-school/pdf-files/handbook.pdf. Students are expected to abide by the University of Florida Academic Honesty Guidelines and to adhere to the following pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

ACCESSIBILITY

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

IMPORTANT NOTICE ABOUT PLAGIARISM

Plagiarism is not tolerated at the University of Florida. The University of Florida has an honor code that defines plagiarism as follows: Section 3a: Plagiarism. A student shall not represent as the student's own work all or any portion of the work of another. Plagiarism includes but is not limited to:

1. Quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution.
2. Submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student.

Please note that intent is not an element of this kind of violation so it is important to take great care to complete the written assignments in your own words. The first incidence of plagiarism, which will be reported to the University, may be punishable by a maximum penalty of a "0" grade for the assignment. Subsequently, a second academic honesty infraction can result in expulsion from the University.

For a complete description of the UF Honor Code and procedures, please visit: https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/.

For a good discussion about plagiarism and how to properly cite your sources, please visit: http://mediasite.video.ufl.edu/Mediasite/Play/adaa44500eaf460a84f238e6b9a558f9 .

COURSE OUTLINE

Due Dates Can Be Found on E-Learning

Videos	Problem Sets/Lecture Exams	Lecturer
Course Introduction		**Jahn**
Receptor Signaling Mechanisms I		**M. Law**
Receptor Signaling Mechanisms II		**M. Law**
TGFB/Smad Signaling I		**Jahn**
TGFB/Smad Signaling I		**Jahn**
	Problem Set 1: Mechanisms and TGFB	
Signaling Diversity I		**Urs**
Signaling Diversity II		**Urs**
Signaling Diversity III		**Urs**
Signaling Diversity IV		**Urs**
	Problem Set 2: Signaling Diversity	
PI3K/MAPK/PLC I		**B. Law**
PI3K/MAPK/PLC I		**B. Law**
	Problem Set 3: PI3K/MAPK/PLC	
TLR-NFkB		**Jahn**

Videos	Problem Sets/Lecture Exams	Lecturer
Apoptosis		**Jahn**
	Problem Set 4: NFkB-Apoptosis	
	Lecture Exam 1	
Oncogenes in Cancer I		**B. Law**
Oncogenes in Cancer II		**B. Law**
	Problem Set 5: Oncogenes	
Basic Principles of Electrophysiology I		**Papke**
Basic Principles of Electrophysiology II		**Papke**
Channel Types, Gating, and Kinetics I		**Papke**
Channel Types, Gating, and Kinetics II		**Papke**
	Problem Set 6: Ion Channels I	
Modulators and Channel Blockers I		**Papke**
Modulators and Channel Blockers II		**Papke**
	Problem Set 7: Ion Channels II	
Investigating Signaling I		**Jahn**
Investigating Signaling II		**Jahn**
Investigating Signaling II		**Jahn**
	Problem Set 8: Investigating Signaling	
	Lecture Exam 2	
	Final Exam	

COURSE EVALUATION

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.