

## USC School of Pharmacy

### Fall 2020: RXRS 402: Human Pharmacology: Challenge of Therapeutics in Society *Subject to change*

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**Office Location:** HSC campus SRH-305 **Office Hours (by appt).**

**Course Weight:** 4 units

**Days/Time:** Tuesday, Thursday: 9:30 am to 10:50 am

**Location:** VPD116 & ONLINE

#### Introduction

Pharmacology combines pharmacy (the science of drug preparation) and therapeutics (the treatment of disease with drugs and other means). This course is designed for upper-level undergraduate students from science majors who want to gain a working knowledge of how drugs are administered, what happens to them once in the body (pharmacokinetics [PK]) how drugs alter disease (pharmacodynamics [PD]); and potentially damage the body (toxicology). Content also focuses on the use of prescription and over-the-counter drugs to prevent and treat diseases (pharmacotherapeutics). The course should give you a basic understanding of many different classes of drugs that are commonly prescribed. It should be important for undergraduates in Pre Pharmacy, Pre Medicine and other health and life science majors as well as students in biomedical engineering. Chapters from the core textbook will be supplemented with a variety of source materials including online resources and articles from scientific journals.

Course Objectives: Upon successful completion of this course, you should be able to:

- Explain how drugs are administered and summarize the different routes of administration
- Describe the important pharmacokinetic parameters (absorption, distribution, metabolism and elimination; ADME) that affect drug dosing in a patient.
- Summarize different drug-receptor interactions and the basic principles of pharmacodynamics (PD)
- Explain the basic principles in the use of drugs to prevent and treat diseases (pharmacotherapy).

- Describe the importance of pharmacogenomics.
- Conclude why particular drugs are prescribed (selected by the clinician) and used in patients and the monitoring of their effects (clinical pharmacology)
- Justify the importance of proper drug use in the treatment of a disease and its relationship to health, economy, and wellbeing of society.
- Judge and debate the societal challenges and perceptions related to the economics of drug availability.
- Deduce why some drugs are toxic to humans and why some individuals have different reactions to a drug (basic principles of toxicology).

**Evaluation and Grading:**

Evaluation will be based on two midterm examinations, a final examination, course quizzes and class participation.

<i>Description</i>	<b>Points</b>	<b>Weight</b>
4 Quizzes @ 10 pts each	40 pts	20%
1 Group presentation (SOAP note)	10 pts	5%
Discussion Board Participation	10 pts	5%
2 Summative Exams @ 40 pts each	80 pts	40%
Final Assignment (Submitted to Blackboard)	60 pts	30%
<b>Total</b>	<b>200 pts</b>	<b>100%</b>

**Class Participation and Attendance (10 points):** Attendance at all classes is expected. Participation will include asking and answering questions and being actively engaged in the discussion. It is expected that students read the assigned papers prior to the lecture and be prepared to discuss background, current understanding, treatments, and gaps in knowledge for the topic in each lecture.

Each student will also participate in Discussion Board posts during the semester or other deliverable assignments on Blackboard. The points will be allocated below

<b>Participation Assignment</b>	<b>Due Date</b>	<b>Points</b>
Blackboard Assignment 1	<b>September 3, 2020 @ 11:59 PM ST</b>	5
Blackboard Assignment 2	<b>October 20, 2020 @ 11:59 PM PST.</b>	5

**Quizzes (40 points):** There will be 4 quizzes (10 points each) over the course of the semester that will primarily be based on questions pulled from the lectures and supplemental resources. These quizzes are meant to be formative in nature to guide students' studies for summative exams and the final assignment. Quizzes include multiple choice and T/F questions as well as a series of questions involving short answers.

**Group Presentation (10 points):** Students will have the opportunity to apply knowledge of medical documentation through the verbal presentation of a SOAP note. The SOAP note document should be uploaded to Blackboard by **November 5<sup>th</sup> 2020 at 11:59 PM PST**. On November 10, all presenters will present to their peers and peers will be responsible for providing feedback to the group.

**Final Exam (60 points):** The Final Exam will be a deliverable assignment submitted to the course instructor on Blackboard. Students will provide an overview of a disease state mentioned in class to practice scientific writing, critical thinking, and apply knowledge of pharmacology through an essay composition. Students will research and share their findings to pharmacological interventions to one of the disease states addressed in lecture. In addition, students will be asked to incorporate how patients with said disease states are being impacted by the COVID-19 pandemic. Further information of the final exam will be released after the 2<sup>nd</sup> summative exam.

### **Make Up Exam Policy:**

All exams and assignments dates are listed in the course schedule. Students are expected to take exams during the scheduled time period listed. Instructors may make arrangements with individual students to take final examinations at times other than the regularly scheduled time if there are exceptional circumstances. It is up to the instructors to work in cooperation with students to schedule appropriate makeup final examination arrangements according to the makeup final examination scheduling policies.

Notes, books, calculators, electronic dictionaries, regular dictionaries, cell phones or any other aids are not allowed during exams.

Students will be asked to complete an anonymous critical evaluation of the course at its completion.

### **Class Policies Regarding Class Discussions and Etiquette**

An overview of the class policies and how they relate to the discussions and interactions that will occur in this class can be found below. We expect each student to review, understand and adhere to these policies.

#### **Respect**

- Listen actively and attentively
- No name calling or other character attacks
- Always use a respectful tone
- Be aware of the fact that tone of voice and body language are powerful communicators. Some postures or facial expressions can silence, intimidate, or hurt your classmates (e.g. crossed arms, eye rolls). Other postures or facial expressions can show you are listening respectfully (e.g. making eye contact, staying quiet, nodding).

#### **Constructiveness**

- If you wish to challenge something that has been said, challenge the idea not the individual sharing it
- Ask for clarification if you are confused
- Commit to learning, not debating

#### **Inclusivity**

- Try not to silence yourself out of concern for what others will think about what you say
- Try not to let your question (or answer) run on. Give others the chance to speak, too.
- Do not remain silent. Make sure to contribute to the discussion
- Take responsibility for the quality of the discussion

## Online learning Etiquette

- If it is not possible to have you webcam on during the entire class, do you best to have it on when speaking
- Turn off your microphone when not speaking
- If you need to step away from your computer during class (e.g. get a drink of water, use the bathroom, attend to a family member/pet) please do so quietly and without disturbing your classmates. Return to the class when you can.
- Be aware the contents of conversations typed into the chat box, even private conversations, are visible by the instructors

## Course Readings

### *Required Readings*

The text is mandatory for this course as it will greatly improve your grasp on the course content. There is a supplemental online student companion website for this course that can be accessed once the textbook is purchased. The chapters identified for your assigned reading in the in the text will support your learning process throughout the semester.

**Pharmacology by Karen Whalen, Pharm.D., BCPS**

**Edition: 7<sup>th</sup> ISBN 978-1-4963-8413-3**

**Format: Paperback w/ Access Code**

**Pub. Date: 2019**

**Publisher(s): Wolters Kluwer**

### *Supplemental Readings*

Supplemental readings are posted on the course website (<http://blackboard.usc.edu/>). These readings have been compiled from a variety of source materials to provide you with current evidence-based practices from the field of pharmacology and augment lecture materials.

Selected chapters from the textbook and supplemental readings should be read according to the course outline below; these materials are relevant for group presentations, quizzes, and exams.

**Prerequisites:** Students should have at completed at least one year of undergraduate biology and/or chemistry (e.g., BISC 220/221 or CHEM 105A/B, etc).

Other topical materials including but not limited to the syllabus, supplemental reading assignments and additional handouts will be posted on <http://blackboard.usc.edu/>. Students will also be encouraged to use the online discussions sessions (via Blackboard) as an additional learning tool.

## Course Outline

This course will be in the format of a directed lecture under the guidance of the instructor for the specific session. During each biweekly session, the instructor will engage the students with questions and draw comments or interpretations primarily based on the assigned reading. Students are expected to ask questions and participate in an interactive fashion. Because this is an area of rapid change in policies, the readings may vary from one term to the next.

The course schedule is as follows:

Week	Date	Topic	Presenter
Week 1	08/18/2020	<p><b>Introduction: expectations and goals of this class.</b>  <b>Basic principles of pharmacology.</b></p> <p><i>Assigned and Supplemental Reading (View Youtube Links below)</i></p> <ul style="list-style-type: none"> <li>• <a href="#">What is Pharmacology</a></li> <li>• <a href="#">Basics on PK: what the body does to a drug</a></li> <li>• <a href="#">Brief overview of Pharmacodynamics</a></li> </ul>	Dr. Davies
	08/20/2020	<p><b>Pharmacodynamics</b>  <b>Pharmacokinetics</b>  <b>Biotransformation</b>  <b>Pharmacogenomics</b>  <b>PK/PD</b></p> <p><i>Assigned and Supplemental Reading (View Youtube Links below)</i></p> <ul style="list-style-type: none"> <li>• <a href="#">Pharmacokinetics</a></li> <li>• <a href="#">Clearance</a></li> </ul>	Dr. Davies
Week 2	08/25/2020	<p><b>Quiz 1 : 08/25/2020</b></p> <p><b>Clinical presentation: “How to effectively utilize PK/PD in the management of patients”</b></p>	Dr. Ashutosh Kulkarni
	08/27/2020	<p><b>Clinical presentation: “How to effectively utilize PK/PD in the management of patients”</b></p>	Dr. Ashutosh Kulkarni
Week 3	09/01/2020	<p><b>Introduction to Autonomic Pharmacology</b></p> <p><i>Assigned and Supplemental Reading (View Youtube Links below)</i></p> <ul style="list-style-type: none"> <li>• <a href="#">Autonomic nervous system</a></li> <li>• <a href="#">Pharmacodynamics discussing protein targets</a></li> <li>• Pharmacology, Chapters 3-7</li> </ul>	Dr. Davies
	09/03/2020	<p><b>Drugs affecting the autonomic nervous system</b></p> <p><i>Assigned and Supplemental Reading (View Youtube Links below)</i></p> <ul style="list-style-type: none"> <li>• <a href="#">Anti- adrenergic Antagonist</a></li> <li>• <a href="#">Cholinergic drug</a></li> <li>• <a href="#">Anti Cholinergic &amp; Neuromuscular Blocking</a></li> </ul> <p><b>BlackBoard Assignment 1 due at 11:59PM PST.</b></p>	Dr. Davies

<b>Week 4</b>	09/08/2020	<b>Drugs with important actions on smooth muscle</b>	Dr. Davies
	09/10/2020	<p><b>Quiz #2 Sept 10</b></p> <p><b>Histamine; serotonin; vasoactive peptides; the eicosanoids; nitric oxide; drugs used in asthma</b></p> <p><i>Assigned and Supplemental Reading</i></p> <ul style="list-style-type: none"> <li>• Pharmacology: Special Topics in Pharmacology: Chapters 37, 39</li> <li>• Histamine and Serotonin;</li> <li>• Drugs for Disorders of the Respiratory System</li> </ul>	Dr. Davies
<b>Week 5</b>	09/15/2020	<b>Clinical Uses of Adrenergic Agents in the Acute Care Setting</b>	Jenny Nguyen, PharmD
	09/17/2020	<b>Clinical Consideration and Challenges of Managing of Asthma</b>	Emily Kim, PharmD
<b>Week 6</b>	09/22/2020	<p><b>Introduction to CARDIOVASCULAR-RENAL DRUGS</b></p> <p><i>Assigned and Supplemental Reading (View Youtube Links below)</i></p> <ul style="list-style-type: none"> <li>• <a href="#">HYPERTENSION &amp; ANTIHYPERTENSIVES (MADE EASY)</a></li> <li>• <a href="#">Review for antiarrhythmic drugs</a></li> </ul>	Dr. Davies
	09/24/2020	<b>Clinical Consideration and Challenges of Managing of Hypertension</b>	Sarine Arakelian, PharmD
<b>Week 7</b>	09/29/2020	<p><b>Heart failure and antianginal drugs</b></p> <p><b>Midterm 1 - 09/29/2020 (Open on BB from 5-10PM PST)</b></p>	Dr. Phan
	10/01/2020	<b>SOAP Notes: Medical Documentation</b>	Vivan Or, PharmD
<b>Week 8</b>	10/06/2020	<p><b>Drugs for Diabetes</b></p> <p><i>Assigned and Supplemental Reading</i> Pharmacology, Chapters 24</p>	Dr. Davies
	10/08/2020	<p><b>Quiz #3 Oct 8</b></p> <p><b>Clinical Consideration and Challenges of Managing of Diabetes</b></p>	Ellen Son, PharmD

<b>Week 9</b>	10/13/2020	<b>Clinical Management of People Living with HIV.</b>	Kathryn Collins, PharmD
	10/15/2020	<b>Principles of Infectious Diseases: Antiviral Therapy</b>	Dr. Phan
<b>Week 10</b>	10/20/2020	<b>Why is COVID related Mortality/Morbidity significantly greater in African American population</b>  <b>BlackBoard Assignment 2 due at 11:59PM PST.</b>	Dr. Burkhardt
	10/22/2020	<b>Midterm 2 - 10/22/2020</b>	
<b>Week 11</b>	10/27/2020	<b>Introduction to the pharmacology of CNS drugs. Drugs for Neurodegenerative Diseases: Parkinson's Disease</b>  <i>Assigned and Supplemental Reading (View Youtube Links below)</i> <ul style="list-style-type: none"> <li>• <a href="#">Exercise: Yes or No</a></li> <li>• <a href="#">Pathophysiology of Parkinson's Disease</a></li> <li>• <a href="#">Basic medications overview of PD</a></li> </ul>	Dr. Davies
	10/29/2020	<b>Clinical perspectives on the management of Parkinson's Disease</b>	Dr. Phan
<b>Week 12</b>	11/03/2020	<b>Quiz 4: 11/03/2020</b>  <b>Pharmacology of Alcohol</b> <b>General Principles; drug mechanisms; Case Histories, Energy drinks; caffeine; alcohol</b>  <i>Assigned and Supplemental Reading</i> <ul style="list-style-type: none"> <li>• Pharmacology Chapter 45</li> </ul>	Dr. Davies
	11/05/2020	<b>Clinical Management of Substance Use Disorder</b>	Dr. Phan
<b>Week 13</b>	11/10/2020	<b>Group student presentations. 10 mins each.</b> <ul style="list-style-type: none"> <li>• Presented in groups of 2-3 students per group.</li> </ul>	Students

		Assigned and Supplemental Reading <ul style="list-style-type: none"> <li>• <a href="#">FRONTLINE</a></li> <li>• <a href="#">Supplements and Safety</a></li> <li>• Pharmacology, Chapter 48</li> </ul>	
	11/12/2020	<b>Clinical toxicology</b> <b>Risk vs Hazard</b> <b>Routes of exposure for toxins</b> <b>Important targets of toxicity</b> <b>What makes a drug toxic; management of the poisoned patient.</b>	Dr. Martine Culty
<b>Finals Week</b>	<b>Submit your Final Exam to Blackboard</b> <b>Due Date: Thursday, November 19 @10 a.m.</b>		



## Statement on Academic Conduct and Support Systems

### Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

### Support Systems:

*Counseling and Mental Health - (213) 740-9355 – 24/7 on call*

[studenthealth.usc.edu/counseling](http://studenthealth.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*

[suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call*

[studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298*

[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*

[usc-advocate.symplicity.com/care\\_report](http://usc-advocate.symplicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity |Title IX for appropriate investigation, supportive measures, and response.

*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](http://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking

needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Campus Support and Intervention - (213) 821-4710*

[campussupport.usc.edu](http://campussupport.usc.edu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.

## Supplement: Zoom and Blackboard

### Zoom

[Zoom](#) is a videoconferencing application that enables audio and video conferencing between multiple users on both desktop computers and mobile devices. It can allow faculty to host class lectures, discussions, share screens and files, and chat with students using a PC, tablet, or even a cell phone equipped with a camera. Zoom is available to all faculty and students at no cost.

- Instructors may host live class sessions on Zoom at the same day and time as their regular class.
- Instructors are required to [record all Zoom lectures](#) and discussions for ADA (Americans with Disabilities Act) compliance, but also to accommodate students who may not be able to keep to the original class schedule.

Links to the recordings of lectures will be posted and organized in Blackboard as soon as they are available.

#### 1. Getting Started with Zoom:

- You might be required to use Zoom in this course, please familiarize yourself with it by thoroughly reading all of the materials and [the step-by-step instructions](#).
- You will access the Zoom meeting space in one of two ways:
  1. Log in via blackboard after you have followed the instructions to initially download, install, and login. Then enter the meeting by going to the link **USC Zoom Meetings** in the left-hand navigation pane. You will need to click the “Join” button next to the classroom for the time set for the meeting.
  2. Copy and paste the URL (or click on the web link) provided by your instructor at the time specified for the meeting. Launch the app (after initially downloading, installing, and logging in), and you will enter the meeting immediately.
- You may choose to use Zoom on your mobile device (phone or tablet).

#### 2. Things to Know About Zoom:

- Because you sign in using your USC information, you have your own profile in Zoom.

- Attendance and participation can be tracked using your USC profile.
- You can find the privacy and accessibility policies for Zoom by clicking on the Learner Support tab in the left-hand navigation pane of your Blackboard course.

## **Blackboard**

[Blackboard](#) is the University's Learning Management System (LMS) used by instructors across campus to distribute course materials, communicate with students in discussion boards, and to collect and assess student work through assignments, quizzes, and tests. A Blackboard course is created for every course at USC and should be the primary tool used for classroom management and communication.

Visit <https://blackboardhelp.usc.edu> to learn more about the various functions of Blackboard.