

USC Mann

Alfred E. Mann School of Pharmacy
and Pharmaceutical Sciences

Fall 2024: RXRS 402: Human Pharmacology: Challenge of Therapeutics in Society

Updated: 08-26-2024

Instructors:

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Office Hours: TBA

Course Weight: 4 units

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

Location: DMC Room 102

Catalogue Description:

Principles of human pharmacology/toxicology related to prescription, over the counter medications; nutraceuticals; drug-drug interactions; polypharmacy; hot topics related to recently approved drugs.

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 patientsand 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 differentreactions to a drug (basic principles of toxicology).

Evaluation and Grading

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

Description	Points	Weight
<i>6 Quizzes@ 10 pts each</i>	60 pts	30%
<i>2 Assignments</i>	40 pts	20%
<i>1 Summative Midterm Exam</i>	40 pts	20%
<i>Final Exam</i>	60 pts	30%
Total	200 pts	100%

Each student will also participate in Assignment (Discussion Board) posts during the semester or other deliverable assignments on Brightspace. These assignments are designed to add understanding of key principles of pharmacology and will help prepare you for the Midterm and Final exam. The points will be allocated below:

Participation Assignment	Due Date	Points
Assignment 1	September 26, 2024	20
Assignment 2	Thursday, Nov. 14, 2024	20

Quizzes (60 points): There will be 6 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.

- Quiz 1: Tuesday, September 3, 2024

- Quiz #2: Tuesday, September 10, 2024
- Quiz #3: Thursday, September 26. 16, 2024
- Quiz #4: Tuesday, Oct. 22, 2024
- Quiz #5: Tuesday, Nov 12, 2024
- Quiz #6: Tuesday, Nov. 26, 2024

Midterm Exam (40 points): The exam will include multiple choice and T/F questions as well as a series of questions involving short answers.

- Midterm: **Tuesday, October 8, 2024**

Final Exam (60 points): The final exam (60 points) will include multiple choice and T/F questions as well as a series of questions involving short answers. The final exam will be cumulative but will emphasize material covered after the 2nd midterm.

- **Thursday, December 12, 2024, 11 AM to 1 PM**

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 listed. Instructors may decide 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
- Know 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 your webcam on during the entire class, do your 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 text will support your learning process throughout the semester.

**Pharmacology by Karen Whalen, Pharm.D., BCPS Edition: 7th 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 (<https://brightspace.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.

Other topical materials including but not limited to the syllabus, supplemental reading assignments and additional handouts will be posted on <https://brightspace.usc.edu/>. Students will also be encouraged to use the online discussions sessions (via Brightspace) 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	Tues. Aug. 27	<p>Introduction: expectations and goals of this class. Basic principles of pharmacology.</p> <p><i>Assigned and Supplemental Reading (View YoutubeLinks below)</i></p> <ul style="list-style-type: none"> • What is Pharmacology • Basics on PK: what the body does to a drug • • Brief overview of Pharmacodynamics 	Dr. Davies
	Thur. Aug. 29	Pharmacodynamics; PK/PD	Dr. Davies
Week 2	Tues. Sept 3	<p>Quiz 1: Tuesday September 3, 2024</p> <p>Considerations of key Clinical Pharmacokinetic properties</p> <p><i>Assigned and Supplemental Reading (View Youtube Links below)</i></p> <ul style="list-style-type: none"> • Importance of Drug Clearance in ADME • Cyp 450 and Metabolism • Kidney and Bile Excretion 	Dr. Davies
	Thur. Sept 5	Importance of Pharmacogenetics and Geriatric Pharmacology PK/PD	Dr. Davies
Week 3	Tues. Sept. 10	<p>Quiz 2: Tuesday, September 10, 2024</p> <p>Introduction to Autonomic Pharmacology <i>Assigned and Supplemental Reading (View YoutubeLinks below)</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Autonomic nervous system <input type="checkbox"/> Cholinergic drug <input type="checkbox"/> Nicotinic <input type="checkbox"/> Muscarinic <input type="checkbox"/> Pharmacology, Chapters 3-7 	Dr. Davies
	Thur. Sept. 12	<p>Drugs affecting the autonomic nervous system <i>Assigned and Supplemental Reading (View YoutubeLinks below)</i></p> <p>Adrenergic Agonists Flight or Flight response</p> <ul style="list-style-type: none"> • Cholinergic drug <p>Anti Cholinergic & Neuromuscular Blocking Autonomic Regulation Therapy (ART) via electrical stimulation of the vagus nerve.</p>	Dr. Davies

		<ul style="list-style-type: none"> • https://www.youtube.com/watch?v=Sc7znFkW9PM 	
Week 4	Tues. Sept. 17	<p>Drugs with important actions on smooth muscle Introduction to Histamine; serotonin; vasoactive peptides; the eicosanoids; nitric oxide; drugs used in asthma</p> <p><i>Assigned and Supplemental Reading</i></p> <ul style="list-style-type: none"> • Pharmacology: Special Topics in Pharmacology: Chapters 37, 39 • Histamine and Serotonin; Drugs for Disorders of the Respiratory System 	Dr. Davies
	Thur. Sept. 19	<p>Clinical Consideration and Challenges of Managing of Asthma</p>	Fiona Goh, PharmD
Week 5	Tues. Sept. 24	<p>Clinical Uses of Adrenergic Agents in the Acute Care Setting</p>	Gennifer Unell, PharmD
	Thur. Sept. 26	<p>Quiz #3: Thursday, September 26, 2024</p> <p>Over the Counter Treatment of Gastrointestinal Issues: · Intestinal Gas · Anorectal Disorders · Constipation, Diarrhea, Heartburn · Pinworms</p> <p>Brightspace Assignment 1: Thursday, September 26, 2024</p>	Dr. Phan
Week 6	Tues. Oct 1	<p>Introduction to CARDIOVASCULAR-RENAL DRUGS</p> <p><i>Assigned and Supplemental Reading (View YoutubeLinks below)</i></p> <ul style="list-style-type: none"> • https://www.youtube.com/watch?v=V2sEay-E-Ro • BASIC PHARMACOLOGY OF ANTIHYPERTENSIVE AGENTS 	Dr. Davies

	Thur. Oct 3	Clinical Consideration and Challenges of Managing of Hypertension	Anna Wang, PharmD
Week 7	Tues. Oct. 8	Tuesday, October 8, 2024: Midterm - Covering Weeks 1-6 Midterm exam date cannot be changed due to travel, nor can the final exam be administered remotely	Students
Fall Recess, Thursday Oct. 10 to Friday, Oct. 11, 2024. No class on Thurs. Oct. 10			
Week 8	Tues. Oct. 15	Drugs for Diabetes Assigned and Supplemental Reading Pharmacology, Chapters 24 Overview of Diabetes https://www.youtube.com/watch?v=HJGjNTJgf48 Diabetes – Barbara’s Story https://www.youtube.com/watch?v=wNixQ1ejOC0	Larisa Yedigarova
	Thur Oct 17	Clinical Management of Diabetes	Evelyn Mendoza, PharmD
Week 9	Tues. Oct. 22	Quiz #4: Tuesday, Oct. 22, 2024 Pharmacists Patient Care Process/How to Work Up Patients Shared decision making/motivational interviewing	Brian Ma, PharmD
	Thurs. Oct.24	Diabetes continued – refresher on mechanism and short presentation on Drugs used for Diabetes https://www.youtube.com/watch?v=LWDQyaKVols	Larisa Yedigarova, MD
Week 10	Tues. Oct. 29	Clinical Management of People Living with HIV.	Louisa Landolt, PharmD
	Thurs. Oct. 31	Clinical Management of Corticosteroids	Brian Ma, PharmD

Week 11	Tues. Nov 5	Clinical perspectives on the management of Parkinson's Disease <i>Assigned and Supplemental Reading (View YouTubeLinks below)</i> <ul style="list-style-type: none"> • Exercise: Yes or No • Pathophysiology of Parkinson's Disease Basic medications overview of PD	Basma Saadallah, PharmD
	Thurs. Nov. 7	Physical Assessment Laboratory Values	Brian Ma, PharmD
Week 12	Tues. Nov. 12	Quiz #5: Tuesday, Nov 12, 2024 Pharmacology of Alcohol General Principles; drug mechanisms; Case Histories, Energy drinks; caffeine; alcohol <i>Assigned and Supplemental Reading</i> <ul style="list-style-type: none"> • Pharmacology Chapter 45 	Dr. Davies
	Thurs Nov 14	Clinical Management of Substance Use Disorder Brightspace Assignment 2: Thursday, Nov. 14, 2024	Savannah Fraley, PharmD
Week 13	Tues. Nov. 19	Clinical Management of Pain Management	Joshua Ramos, PharmD
	Thurs. Nov. 21	SOAP Notes: Medical Documentation	Mary Ohanyan, PharmD
Week 14	Tues. Nov. 26	Quiz #6: Tuesday, Nov. 26, 2024 Case Studies in Clinical Pharmacology	Tam Phan, PharmD
		Thanksgiving Holiday, Wednesday, Nov. 27 to Sunday, Dec. 01, 2024	
Week 15	Tues. Dec 3	Clinical toxicology-Risk vs Hazard Routes of exposure for toxicants	Dr. Martine Culty
Last day of class	Thurs. Dec 5	Important targets of toxicity What makes a drug toxic Management of the poisoned patient.	Dr. Martine Culty
FINAL EXAM		In class Final Exam: Thursday, December 12, 2024 11 a.m.-1 p.m. Final Exam Policy: https://classes.usc.edu/term-20243/finals/	

		Final exam cannot be changed due to travel, nor can the final exam be administered remotely	
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Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment. Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Academic Integrity:

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university’s mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or “recycle” work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the [student handbook](#) or the [Office of Academic Integrity’s website](#), and university policies on [Research and Scholarship Misconduct](#).

Statement on Academic Conduct and Support Systems

Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

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

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

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086
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
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776
OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101
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
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) 442-1200 – 24/7 on call
Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

