



School of Pharmacy
Research Techniques Course Syllabus
Course# PHAR 6211
Course Dates (06/17/2019 – 06/28/2019)
Monday-Friday and 9:00am-12:00pm, Campbell Building, Room 202

Course Coordinator: Ian Mendez, Ph.D.
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Office Hours: Tuesdays and Thursdays 1:00pm – 2:00pm, Campbell Room 715

Course Description

According to the Center of Evidence-Based Medicine, a better understanding of qualitative and quantitative research design and theory can offer a more comprehensive and deeper understanding of key issues in health care. Research Techniques is an elective course that provides students with a comprehensive and interdisciplinary understanding of common experimental methods and research approaches used in the Pharmaceutical Sciences. Students will first be introduced to research theory and experimental design by learning about the Scientific Method and hypothesis formation, experimental approaches and designs, experimental validity and reliability, appropriate experimental control, reporting of findings, and research ethics. The course will then introduce students to a wide range of research techniques, including computer based drug discovery, biochemistry, immunology, genotyping, pharmacology, and animal models, among others. Course activities will include didactic lectures, guest speakers, and in-class reviews and discussions of notable research manuscripts, and exams. Ultimately, this course will develop students' critical thinking and problem solving skills, provide them with a foundation in experimental design and familiarize them with common research techniques utilized in the Pharmaceutical Sciences, all with the goal of strengthening their evidence based learning and improving their decision making for patient care plans.

What part of PPCP (Pharmacists' Patient Care Process) is addressed. This course assists students in collection of data and assessment of methods utilized in the pharmaceutical sciences.



Office Hours

Dr. Ian Mendez: Dr. Mendez will host office hours (T&R, 1pm-2pm, Campbell 715) and will accommodate students as time permits. Students may request an appointment with Dr. Mendez in person or via e-mail at least 48 business hours in advance. Guest lecturers should not be contacted unless the course coordinator has given permission to do so.

Course Learning Objectives

At the conclusion of this course, students shall be expected to:

1. Understand and criticize basic concepts in research theory, experimental design, and peer reviewed publication.
2. Understand computer aided drug discovery and perform basic biochemical calculations.
3. Describe the concept of Recombinant DNA technology and its applications
4. Understand tissue/cell culture and how buffers are prepared in the laboratory.
5. Understand immunological methods (ELISA, Western blot), and their applications in research.
6. Describe liquid chromatography and electrophoresis separation methods, and their applications.
7. Understand the concept of transgenic animals, how they are generated, and their applications in research.
8. Understand different types of microscopy and their applications in research.
9. Understand the use of animal behavioral studies and application in research.
10. Understand how microdialysis, electrophysiology, and optogenetics are used in neuropharmacology research.

Detailed Course Meetings & Location

Campbell building: Room 202

Date and time: Monday-Friday and 9:00am-12:00pm

In a major disruption (e.g., H1N1 epidemic, subzero weather), be prepared to maintain course progress via other means (e.g., Internet, our Blackboard course shell, etc.) and check your email (especially your UTEP miners account) regularly.

Online Platform/Blackboard: Accessing Course Content on Blackboard: All lectures, handouts, and course material will be located in Blackboard. Log into My UTEP.edu and click on the Blackboard link to access the online course for PHAR 6211. The course is individualized and students may access lectures/handouts, as they are made available by course lecturers. Except in cases of a UTEP network being “down” or “offline”, you are ultimately responsible to ensure that your computer is connected to the internet and that any issues are addressed prior to class and/or assessments.

Online Assessment Requirements: This course requires the use of ExamSoft® and CORE ELMS®. Students are responsible for creating their online login within the first week of class. If you cannot access your online account, please contact Dr. Jessica Shenberger (jmsenberger@utep.edu) to resolve this issue. Students are responsible for ensuring they have access to the online assessment system. Exams may be disseminated before the due date. This requires students to download the assessment using an internet connection. It is the student’s responsibility to maintain access to a reliable internet connection (with the rare exception of when UTEP’s systems are down).

CAPE Educational Outcomes

The Center for the Advancement of Pharmacy Education (CAPE) has defined educational outcomes to guide the PharmD curriculum (see AACP CAPE Outcomes [weblink](#)). The content of this course will cover the following CAPE educational outcomes. **Level of Assessment:** 1 – Introduce 2 – Reinforce 3 – Apply

	CAPE Outcomes	Assessment Level
1.1	Learner (Learner) Develop, integrate, and apply knowledge from the foundational sciences (i.e., pharmaceutical, social/behavioral/administrative, and clinical sciences) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and patient centered care.	1, 2, 3
3.1	Problem Solving (Problem Solver) Identify problems; explore and prioritize potential strategies; and design, implement, and evaluate a viable solution.	1,2
3.2	Educator (Educator) Educate all audiences by determining the most effective and enduring ways to impart information and assess understanding.	1,2
3.6	Communication (Communicator) Effectively communicate verbally and nonverbally when interacting with an individual, group, or organization.	1,2
	PCOA/NAPLEX Outcomes	
1.5.1	Best practices, scientific literature evaluation, and health-related resources	2
3.6.1	Research study designs used in medical research	2
3.7.3	Research ethics	2
3.8.3	Assertiveness and problem-solving techniques in relation to difficult social and professional conflicts and situations	2

Course Objectives	CAPE Outcomes	PCOA / NAPLEX	Learning Activities	Outcome Measures
Objective 1 Understand and criticize basic concepts in research theory, experimental design, peer reviewed publication	1.1, 3.1, 3.2,3.6	1.5.1 3.6.1 3.7.3	Readings, lectures, discussions, and class activities	Exam, Assignment
Objective 2 Understand computer designed drug discovery research and perform basic biochemical calculations	1.1, 3.1, 3.2,3.6	1.5.1 3.6.1 3.8.3	Readings, lectures, discussions, and class activities	Exam, Assignment
Objective 3 Describe the concept of Recombinant DNA technology and its research applications	1.1, 3.1, 3.2,3.6	1.5.1 3.6.1 3.8.3	Readings, lectures, discussions, and class activities	Exam, Assignment
Objective 4 Understand tissue/cell culture, how buffers are prepared in the laboratory, and their use in research	1.1, 3.1, 3.2,3.6	1.5.1 3.6.1 3.8.3	Readings, lectures, discussions, and class activities	Exam, Assignment
Objective 5 Understand immunological methods and their applications in research	1.1, 3.1, 3.2,3.6	1.5.1 3.6.1 3.8.3	Readings, lectures, discussions, and class activities	Exam, Assignment
Objective 6 Describe the chromatography, separation methods, and their applications in research	1.1, 3.1, 3.2,3.6	1.5.1 3.6.1 3.8.3	Readings, lectures, discussions, and class activities	Exam, Assignment
Objective 7 Understand the concept of transgenic animals, how they are generated, and their applications in research	1.1, 3.1, 3.2,3.6	1.5.1 3.6.1 3.8.3	Readings, lectures, discussions, and class activities	Exam, Assignment
Objective 8 Understand fluorescence, confocal and electron microscopy and their applications in research	1.1, 3.1, 3.2,3.6	1.5.1 3.6.1 3.8.3	Readings, lectures, discussions, and class activities	Exam, Assignment
Objective 9 Understand the basic principles of animal handling and application behavioral studies in research	1.1, 3.1, 3.2,3.6	1.5.1 3.6.1 3.8.3	Readings, lectures, discussions, and class activities	Exam, Assignment
Objective 10 Understand how microdialysis, electrophysiology, and optogenetics are used in neuropharmacology research	1.1, 3.1, 3.2,3.6	1.5.1 3.6.1 3.8.3	Readings, lectures, discussions, and class activities	Exam, Assignment

Expectations of Students During Course

Students are expected to be professionals and will be treated as such unless circumstances deem otherwise. Any behavior that impairs student's ability to learn will not be tolerated. Cell phones should NEVER be heard in class! Cell phones should never be used in class. Sending or receiving text messages during class is unacceptable. Sending or reading emails in class is also unacceptable. Laptops may be used during class for taking notes. Using your laptop for other activities than taking notes causes a disruption to the class around you.

Attendance at lectures is not mandatory, but attendance will be taken at each lecture and points will be given for attending class (see Evaluation and Grading Policy). Attendance and punctuality at lectures are strongly recommended and expected as a sign of professional behavior. Missing class for work is NOT a valid reason for your absence.

It is the responsibility of the **student** to monitor his/her progress during the course. Students should seek advice and assistance from the course coordinator as soon as he/she encounters any difficulty in the course.

Methods of Instruction/Learning

The learning outcomes in this course will be achieved via:

1. **Outside Preparation:** Student will be expected to complete the reading assignments and reviewing the slides and/or handouts before class in order to participate actively during class discussions
 2. **In-class Lectures:** reinforces essential, complex information and models the processes of problem solving.
 3. **Interactive Activities:** Group discussion and manuscript reviews will be employed throughout the course as needed to promote critical thinking, strengthen understanding of techniques, and allow student to work cooperatively.
 4. **Demonstrations:** Exhibitions of materials and procedures utilized in some discussed research techniques.
 5. **Exams/Quizzes** – allows students to demonstrate the course ability outcomes and instructors to provide necessary feedback.
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Required Course Technology/Tools/Needs

Required Textbooks:

- Handouts will be provided by presenting faculty and guest lecturers.

Laptop Computer

- Students are expected to bring laptop computers to the class each day for participation in on-line exercises or assessments. It is the responsibility of the students to make sure that the laptops are in working condition and meets the University and School of Pharmacy IT requirements. (See SOP Student Handbook),

Calculator

- Students are expected to bring a non-programmable calculator to class and to all assessment activities.
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Evaluation and Grading Policy

Course point distribution will be as follows:

Type of Assessment	Total Points	% Course Grade
Exam I	20	10%
Exam II	20	10%
Exam III	20	10%
Article Reviews	40	20%
Attendance/Participation	100	50%
Total	200	100%

Assignment of grades:

A = 90 – 100%, B = 80 – 89%, C = 70 – 79%, F < 70%

It is the responsibility of the **student** to monitor his/her progress during the course and see that he/she is maintaining the required competency level. Students should seek advice and assistance from the course coordinator as soon as he/she encounters any difficulty in the course.

Exams: Three examinations are scheduled at 20 points per exam. Refer to the course calendar for dates and times. All Exams will be administered via ExamSoft®, unless noted otherwise.

Article Review Assignment: A Scientific Article Worksheet will be provided in Blackboard. Students are required to complete and submit via Blackboard, article reviews for 2 of 3 Journal Club sessions scheduled for the course (see course calendar for dates and times), at 20 points per review. A 3rd article review can be submitted for 10 bonus points.

Attendance/Participation: Attendance will be taken during each of the 2 daily class sessions (9:00am to 10:15am and 10:30am-11:45am) through roll call, iclicker questions, exams, or activity participation. Five points will be awarded for attendance/participation in each of the 2 daily sessions, across the 10 days of the course, for a possible total of 100 points.

Missed Exams / Assignments Policy

Only students who cannot attend a class or miss an exam or article review as a result of an **excused absence** will be allowed to make-up the missed assignment or article review. Attendance/participation points missed due to an excused absence will be made up by submission of missed class activities or iclicker questions. Make up article reviews and class activities for excused absences should be submitted within 3 days after the absence has been excused. Make up exams will be taken after the course is completed, but before the end of the Summer term. Students should consult the UTEP School of Pharmacy Student Handbook for definitions and examples of excused absences. No exams, assignments, or attendance/participation points can be made up for unexcused absences.

Note: See Student Handbook for further information

Remediation Policies:

Please refer to the Student Handbook for end-of-course remediation policies and timelines (*see Table of Contents for End of Course Remediation*).

There will be no in-course remediation of any assessment or assignment.

Technical Assistance

Checking computer requirements and ensuring that all software up to date is essential for students to access course content. **Supported browsers include** – 1) For a PC: FireFox, Internet Explorer (Do NOT use IE7), and Chrome, 2) For a Mac: Safari, Firefox, and Chrome. To enhance browser performance, students should clear the browser cache and allow pop-ups. In addition to testing the web browser, check to ensure that the computer has an updated version of Java (go to <http://java.com>, click on “Do I have Java”, click on “Verify Java Version,” update Java if needed). Additional browser plug-ins may also be needed to view some content that your instructor may share on the learning management system. Common plug-ins include: Adobe Reader, Flash Player, Windows Media Player, QuickTime. When creating documents, slide presentations, spreadsheets, etc., be sure to use Microsoft Office or a compatible program (see 10 Free MS Word Alternatives). The UTEP Technology Support Services (3rd floor, UTEP Library) can also provide students with any applications, compatibility packs, patches, and updates that may be needed.

Students working off campus may need to set up a Virtual Private Network (VPN) on their computer to access UTEP resources for this class (i.e. Library). The link below provides information in setting up a VPN connection depending on the operating system. Students may contact the Help Desk for assistance (See Technical Assistance information).

<http://admin.utep.edu/Default.aspx?tabid=58534>

If technical problems are experienced with the course, students should contact the UTEP Helpdesk during: Monday–Friday: 8AM – 5PM. If calling within UTEP: 915.747.4357. If calling from outside UTEP: 915.747.5257. For more information, please visit <http://helpdesk.utep.edu>. For help with Blackboard: <http://admin.utep.edu/Default.aspx?tabid=74094>. In order for UTEP to provide a stable learning environment, Thursdays from 12:00-6:00am MST are reserved for minor preventive maintenance. This maintenance window is scheduled during the lowest usage time for the system.

Blackboard may or may not be available during this time, depending on whether maintenance is necessary. Whenever possible, this time will be utilized to perform all minor maintenance. Unscheduled outages occur rarely, but they do happen. In the event of an unscheduled outage, Technology Support Services will confer with appropriate student and faculty networks to provide appropriate notifications to those affected. Students can also visit an on-campus lab such as the ATLAS lab located within the Undergraduate Learning Center (UGLC building) for additional technical assistance. In addition to the various campus computer labs (ATLAS in UGLC or LACIT in Liberal Arts for example), Technology Support Services provides workstations for student use. To learn more, please visit <http://admin.utep.edu/Default.aspx?tabid=74174>.

Attendance and Classroom Behavior

The attendance policy for the School of Pharmacy is outlined in the Student Handbook. It is expected that students should demonstrate their commitment to the profession and respect for faculty, guest speakers, and colleagues by attending all classes and arriving to class on time prepared for the day's lesson(s). *Attendance will be taken by roll-calling, sign-in sheet, pop quizzes, or any other means deemed appropriate by the course instructors.* If a student has an excused absence, they should immediately notify the course coordinator(s) and instructor(s) as well as the *preceptor and Director of Experiential Education for the IPPE component of this course.* To secure approval for an absence related to travel for professional meetings or for events that fall outside of the criteria outlined in the Student Handbook, please refer to the Handbook for more information regarding required documentation for submission to the Office of Student Affairs.

Exam Day Policy

Students must arrive on time for examinations. Students arriving after any student(s) has/have completed the exam and have left the ILC may not be allowed to sit for the exam, and may receive a score of zero. No allowances will be made for an exam being missed, other than documented illness or emergency. The student must contact the course coordinator for confirmation prior to the exam. If permission is granted to delay the exam, it is the student's responsibility to contact the course coordinator to arrange for an alternative exam time. In this event, the nature of the make-up will be at the discretion of the course coordinator (oral, written, increased weighting on the final, etc.). An unexcused absence from an exam may result in a grade of "zero" for that exam.

UTEP and SOP Policy for Academic Integrity

Any student who commits an act of academic dishonesty is subject to discipline. The instructor is required to report all suspected academic dishonesty to the UTEP Office of Student Conduct and Conflict Resolution. Please refer to the Student Handbook for SOP guidance on academic integrity (*see Table of Contents for Curriculum and Classroom Policies: Academic Integrity*). Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, and any act designed to give unfair advantage to a student or the attempt to commit such acts. Proven violations of the detailed regulations, as printed in the Handbook of Operating Procedures (HOP), and available in the Office of the Dean of Students and on the homepage of the Dean of Students at www.utep.edu/dos, may result in sanctions ranging from disciplinary probation, to a failing grade on the work in question, to a failing grade in the course, to suspension or dismissal, among others. (For more information, see: <http://sa.utep.edu/osccr/academic-integrity/>)

Professionalism and Professional Conduct

While enrolled at the University, a student neither loses the rights nor escapes the responsibilities of citizenship. Thus, UTEP and the SOP value professionalism and expect all students to not only acquire but also maintain the highest standards of professional attitudes and behaviors in their interactions with their fellow classmates, staff, faculty, colleagues and their patients, as described in the Student Handbook and as per UTEP's student conduct policies (see <http://sa.utep.edu/osccr/student-conduct/> & <http://admin.utep.edu/Default.aspx?tabid=73922> for further information). Any student who engages in conduct that is prohibited by the Board of Regents' Rules and Regulations, University or SOP rules or by federal, state, or local law is subject to discipline whether such conduct takes place on or off campus or whether civil or criminal

penalties are also imposed for such conduct. Please refer to the Student Handbook for specific expectations regarding professional conduct in the SOP (*see Table of Contents for Academic Progression: Good Standing: Professional*).

UTEP and SOP Policy for Special Accommodations (ADA)

"If you have or suspect a disability and need classroom accommodations, you should contact the Center for Accommodations and Support Services (CASS) at 747-5148." You can also e-mail the office at cass@utep.edu or go by their office in Union Building East (Room 106). For additional information, visit the CASS website at <http://sa.utep.edu/cass/>

General Statement About Course Policy

The syllabus is subject to change to meet course needs, especially if there are unexpected disruptions or changes in class size, resources, etc. The most updated syllabus can be found on the course Blackboard shell. It is your responsibility to review the syllabus periodically for updates.

Additional Information

Campus Concealed Carry: Effective August 1, 2016. <http://sa.utep.edu/campuscarry/>

Civility Statement: You are expected to follow basic standards of courtesy (<http://admin.utep.edu/Default.aspx?tabid=73922>) and may be dismissed from class for blatant or sustained disruptive behavior.

Cell Phone Policy (Optional for Faculty to adapt or not): Students should carry cell phones, but keep the phone on the vibrate mode in the event students need to be notified by the emergency alert system. Cell phone use for the purpose of texting, email or social media is not permitted. This is disruptive to fellow classmates, faculty and the learning environment. The use of a cell phone or the ringing of the phone in class is considered unprofessional behavior. No cellphones, calculators, laptops or other items may be used during an assessment (e.g., exam or a quiz) unless specifically as part of that assessment and approved by the faculty member/instructor.

Student Support: UTEP provides a variety of resources for those in need (e.g., if you feel overwhelmed stressed or dealing with a crisis).

- UTEP's Counseling Center (free counseling to all students): 747-5302, which after-hours goes to a crisis line
- Mental Health Crisis Line: 779-1800
- National Suicide Prevention Hotline: 1-800-273-8255
- Veterans Crisis Line: 1-800-273-8255
- NAMI (National Alliance Against Mental Illness) of El Paso: 534-5478
- <http://caringeducators.tumblr.com/survival>

Title IX: Title IX of the Education Amendments of 1972 (Title IX), prohibit discrimination on the basis of sex in education programs or activities operated by recipients of Federal financial assistance. Sexual harassment of students, which includes acts of sexual violence, is a form of sex discrimination prohibited by Title IX. Sexual violence refers to physical sexual acts perpetrated against a person's will or where a person is incapable of giving consent due to the victim's use of drugs or alcohol. An individual also may be unable to give consent due to an intellectual or other disability. A number of different acts fall into the category of sexual violence, including rape, sexual assault, sexual battery, sexual coercion, stalking, and relationship violence. All such acts of sexual violence are forms of sexual harassment covered under Title IX. In accordance with Title IX of the Education Amendments of 1972, UTEP does not discriminate on the basis of sex in the operation of its educational programs and activities. This commitment to non-discrimination applies to both employment in and admission to such programs and activities. [Link to full text at <http://admin.utep.edu/Default.aspx?tabid=68750>]

Other: The course coordinator may adapt the syllabus/course calendar to support student and course success.

Course Number PHAR 6211: Research Techniques Course Calendar and Topic Outline
06/17/2019 – 06/28/2019, Monday-Friday and 9am-12pm, Campbell Building, Room 202

Week	Day	Date	Topics	Faculty
1	1	06/17	Course Review	Dr. Mendez
			An Introduction to Research Theory and Experimental Design	Dr. Mendez
1	2	06/18	Computer Aided Drug Discovery	Dr. Sirimulla
			Recombinant DNA technology	Dr. Sirimulla
1	3	06/19	Biological Buffers and Cell Cultures	Dr. Mendez
			Immunology	Dr. Mendez
1	4	06/20	Journal Club	Dr. Mendez
			Exam I (06/18 & 06/19)	Dr. Mendez
1	5	06/21	Separation Methods	Dr. Karim
			Polymerase Chain Reaction	Dr. Karim
2	6	06/24	Transgenic Animals	Dr. Karim
			Microscopy I	Dr. Karim
2	7	06/25	Journal Club	Dr. Mendez
			Exam II (06/21 & 06/24)	Dr. Mendez
2	8	06/26	Animal Models and Behavioral Research	Dr. Mendez
			Microdialysis	Dr. Carcoba
2	9	06/27	Electrophysiology	Dr. Simon
			Optogenetics	Dr. Peña
2	10	06/28	Journal Club	Dr. Mendez
			Exam III (06/26 & 06/27) - Article Reviews Due	Dr. Mendez