

## **PSYCH 6315: Psychopharmacology**

Spring 2019; Room: LART 209

Tuesdays 4:00-6:50pm

### **Instructor: Katherine M. Serafine, Ph.D.**

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Office Hours: Tuesday - email for appointment time.

**Course Description:** A study of current topics and recent developments in the biochemical basis of psychopathology and related strategies of psychopharmacological intervention. This course is split into phases to transition us from lecture based material to more discussion/journal club type meetings.

- **Phase 1** spans the first 5 class periods are more “lecture based” and will serve as more of a “crash course” in basic neuroscience and pharmacology principles. This section serves as “breadth” and foundational knowledge to carry us through the semester.
- The class period immediately preceding Exam 1 will begin **Phase 2** (a hybrid session somewhere between a discussion and a lecture) where I will lecture generally about how recreational drugs work, and then we will begin a more in depth discussion on the current model of addiction proposed by the National Institute on Drug Abuse (NIDA). Following Exam 1 we will continue Phase 2 by examining other models of addiction (i.e., the positive reinforcement, physical dependence, incentive sensitization, opponent process and allostasis models of addiction). During this phase most of the readings will be supplemental articles to transition us into more of a “journal club” style of meeting, but I will still be leading the discussions.
- **Phase 3** will begin on April 2<sup>nd</sup>, where for the remaining class periods, we will dive deeper into psychopharmacology by applying what we have learned to specific topics of interest related to current events (i.e., the opioid crisis, emerging synthetic cathinone drugs, using hallucinogenic drugs as therapeutic medicine). By Phase 3 all graduate students enrolled should be prepared to lead the discussion for any of the assigned readings.

**Learning Objectives:** A first goal of this course is to provide breadth (during phase 1) covering broad topics in neuroscience, pharmacology, and psychology. Students should leave phase 1 with a basic understanding of how neuronal communication occurs and which neurotransmitters/brain areas are responsible for certain behavioral effects. A second goal of this course is to provide depth (during phases 2 and 3) of knowledge to apply behavioral pharmacological principles to specific topics (e.g., to examine individual drugs of abuse) and to examine current events in psychopharmacology (e.g., the opioid crisis). A final goal of this course is to teach graduate students how to take an active role in learning about neuroscience, where by the end of the semester (during phase 3) they will be leading discussions (rather than the instructor) on current events and seminal research that shaped the field of psychopharmacology.

**Accommodations and Support Services:** If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass). Individuals requiring more time for the exam through CASS must schedule their exam time with CASS to be completed no later than 5pm the same day the class takes the exam. You must notify me if you require accommodations via CASS no later than one week before the first exam.

**Blackboard:** Everything you need for this class can be found on Blackboard. Please check Blackboard for announcements at least once per week. Blackboard is also where you will find all supplemental materials relevant to the course (including supplemental articles and videos). Make sure you check your email regularly for updates from me via blackboard.

**Attendance:** To do well in this course, you are encouraged to attend every class session, listen actively, take notes and ask questions. You will be graded on participation (see below).

**Required Reading:**

- 1) Molecular Neuropharmacology: A foundation for clinical neuroscience (third edition). Eric J. Nestler. Steven E. Hyman. David M. Holtzman, and Robert C. Malenka. McGraw Hill, 2015.
- 2) Supplemental Articles: Current research reports or scanned chapters from other texts provided at least 5-7 days prior to date of lecture discussion via blackboard and are listed in the course schedule below.

**Grading: Up to 300 points total**

**Exams 200pts:**

- There will be 2 exams, each worth 100 points during the course of this semester (dates below).
- Exams will not be cumulative.
- Exam format will be free response (short answers and essays).
- Exam 1 will be on March 5<sup>th</sup> and will cover all lectures and book chapters as well as other assigned readings up to that point.
- Exam 2 will be during finals week and will cover all lectures and book chapters as well as other assigned readings in the second part of the class.

**Class participation 20pts:**

- To earn these points you must ask questions, engage, and participate. This class is designed to be more of a conversation than a lecture. It is important that you ask questions and be a part of the discussions. Participation could be either oral or written assessments during class.
- We will have 12 class periods, not including the exam. **You must participate in at least 10/12 discussions in order to earn all 20 points.** That is, you can earn up to 2 points a day participating in class, demonstrating that you read before class, asking questions or leading a discussion.
- Participation in all 12 discussions will actually result in your ability to earn 24 points (e.g., **4 points extra credit toward your final grade**). Note this extra credit will be added to the total out of 300, not the percentage.

**Article Summaries 20pts:**

- You will have to find, read and summarize two recent journal articles (2014-2019) about psychopharmacology that provide an update or an extension of material covered in the lecture or in the readings. Each summary must cover a different topic (one from each section of the class). Each summary is limited to two double-spaced pages (Calibri font, size 11, 1 inch margins) and is worth 10pts toward your final grade. A rubric for article summaries is provided on blackboard to demonstrate how you will be graded on these assignments. The rubric document also includes all relevant information about citations/bibliography and formatting. Please review this carefully and email me if you have questions.
- You MUST to have prior approval from me for each article you intend to summarize. **The PDF of the article must be submitted to me for approval no later than 5pm one week prior to the summary due date. The summaries will be due by 5pm on Friday March 1 and Friday May 3. Late approvals or summaries will not be accepted.**

**Final Paper “theory to practice” 60pts:**

- You will need to provide an overview on the application of basic psychopharmacology to some clinical issue (for example: the biological treatment of mood disorders, the biology of obesity, the neurochemistry of learning and memory, epigenetics and stress). This overview should be no more than 600 words (double-spaced, Calibri font, size 11). This is due at 11:59pm on May 13<sup>th</sup> via blackboard submission. **Late papers will not be accepted**, but I am happy to discuss a draft of the paper if you provide it to me prior to the due date and with a minimum of 24 hours to review it and give you comments.
- A rubric describing how you will be graded on this assignment is provided on blackboard.
- The rubric document also includes all relevant information about citations/bibliography and formatting. Please review this carefully and email me if you have questions.

**Extra Credit 6pts:**

- I realize as graduate students you do not *need* extra credit opportunities. However, I am a firm believer that all writing is improved by proofreading.
- You can earn extra credit by using the University Writing Center for grammatical help on writing assignments (once for each article summary and once for the final paper).
- If you go to the writing center in person (request proof of your visit for me, and they’ll give you a piece of paper to turn in) before the deadline for each article summary and the final paper you will earn 2 pts extra credit for each assignment (e.g., **6 points extra credit toward your final grade**). Note this extra credit will be added to the total out of 300, not the percentage.
- Note that you can only earn up to 2pts maximum per writing assignment, but you can go to the writing center as much as you want for assistance. Online consultations will not earn extra credit. Your visit must be dated BEFORE the assignment deadline in order to count as extra credit.

**Final Grade Calculation:** Final grades will be calculated as follows (points earned +any extra credit/300) x 100.

**Grading scale:**

A = 90.0-100.0%

D = 60-69.9%

B = 80.0-89.9%

F < 60.0%

C = 70.0-79.9%

Please note that grades will not be “rounded up”. Therefore a 79.5% will be entered as a “C”. **No exceptions will be made.** If you are worried about your grade being on the “threshold” you should engage in extra credit opportunities outlined above proactively. No additional extra credit opportunities will be provided. If you have any questions or disputes regarding grades, you must raise these in writing within ten days of the grade being released. Grades will only be changed in cases of administrative error. I do not hand back exams, if you wish to see your exam after it has been graded, you must schedule an appointment to come meet with me. If you want to file a formal complaint about grading, please contact the UTEP Psychology Department Chair.

## Course Schedule

Topic bolded, reading italicized

January	22	<b>Psychopharmacology: Introduction and approach</b> <b>Neuroanatomy and the electrical properties of neurons</b> <i>Chapter 1 - Basic Principles of Psychopharmacology</i> <i>Chapter 2 - Cellular basis of communication</i> <ul style="list-style-type: none"><li>• Skip the section on cyclic nucleotide-regulated channels and TRP channels. Be sure to start back up on page 48 (chloride channels)</li></ul>
	29	<b>Principles of Pharmacology: Pharmacokinetics and Pharmacodynamics</b> <i>Chapter 3 - Synaptic Transmission</i> <ul style="list-style-type: none"><li>• Read the first few pages, and stop at page 67 (synaptic vesicles and dense core vesicles).</li></ul>
February	5	<b>Neurotransmission and signal transduction</b> <i>Chapter 4 - Signal Transduction in the Brain</i> <ul style="list-style-type: none"><li>• The only required portions of this chapter are figure 4-1, 4-2, and 4-3. The rest is optional reading.</li></ul>
	12	<b>Neurotransmitter Systems: Acetylcholine, Monoamines, Opioids and Cannabinoids</b> <i>Chapter 6 - Widely Projecting Systems: Monoamines, Acetylcholine, and Orexin</i> <ul style="list-style-type: none"><li>• Pages 149-170 only</li></ul> <i>Chapter 7 - Neuropeptides</i> <i>Chapter 8 - Atypical Neurotransmitters</i> <ul style="list-style-type: none"><li>• Pages 207-211 only</li></ul>
	19	<b>Neurotransmitter Systems: Glutamate &amp; GABA</b> <b>Glutamate: long term potentiation</b> <b>Therapeutic drugs: Ideal versus reality: case study with antipsychotics</b> <i>Chapter 5 - Excitatory and Inhibitory Amino Acids</i>
	26	<b>What is addiction? Part 1: Addiction as a brain disease</b> <i>Supplemental Articles: Leshner 1997; Levy 2013; Volkow &amp; Koob, 2015, Volkow &amp; Fowler, 2000</i>
March	5	<b>Exam 1</b>
	12	<b>What is addiction? Part 2: Positive reinforcement, physical dependence and incentive sensitization models</b> <i>Chapter 16 – Reinforcement and Addictive Disorders</i> <i>Supplemental Articles: Wise and Bozarth, 1987; Wikler 1980; Robinson &amp; Berridge, 2008</i>

	19	SPRING BREAK- NO CLASS
	26	<p><b>What is addiction? Part 3: Opponent Process and Allostasis models</b></p> <p><b>Acute effects of drugs: Stimulants</b></p> <p><i>Chapter 16: Reinforcement and Addictive Disorders</i>  <i>Supplemental Articles: Solomon &amp; Corbit, 1974; Koob &amp; LeMoal, 2001, Ritz (1987 and 1988), Baumann et al., 2014 (cathinone section only)</i></p>
April	2	<p><b>The opioid crisis</b></p> <p><b>Pain: opioids and cannabinoids, and emerging cannabinoid drugs</b></p> <p><i>Chapter 16 –Reinforcement and Addictive Disorders (opioid and cannabinoid sections only)</i>  <i>Chapter 11 - Pain (page 283 through end of chapter).</i>  <i>Supplemental Articles: Li et al., 2008; Li et al., 2012; Baumann et al., 2014 (cannabinoid section only); Ginsburg et al., 2012</i></p>
	9	Experimental Biology Conference– NO CLASS
	16	<p><b>Alcohol and Nicotine</b></p> <p><i>Chapter 16- Reinforcement and Addictive Disorders (sections on ethanol and nicotine)</i>  <i>Supplemental Articles: Rassnick et al., 1993; Altschuler et al., 1980; Corrigall et al., 1992; Nissel et al., 1995; Pontieri et al., 1996</i></p>
	23	<p><b>Hallucinogenic drugs: recreational or medicinal?</b></p> <p><i>Supplemental Articles: Fantegrossi et al., 2010; Canal &amp; Morgan, 2012; Johnson et al., 2018; Retraction Watch, TedMED Q&amp;A with Roland Griffiths</i></p>
	30	<p><b>Feeding behavior and obesity: emerging therapeutics</b></p> <p><i>Chapter 10 - Neural and Neuroendocrine Control of the Internal Milieu</i>  <i>Pages 262-267 only</i>  <i>Supplemental Articles: Tomasai &amp; Volkow, 2013; Lorcaserin Prescriere; Collins et al., 2015</i></p>
May	7	<p><b>Mood disorders, the stress response and the “dark side” of addiction</b></p> <p><i>Chapter 10 - Neural and Neuroendocrine Control of the Internal Milieu</i>  <i>Pages 245 - 261</i>  <i>Chapter 15 - Mood and Emotion</i>  <i>Supplemental Articles: Koob et al., 2014; Koob &amp; Mason, 2015; Nestler, 2014; Nestler et al., 2002; Russo &amp; Nestler, 2013</i></p>
	TBD	<b>Final exam– Exam 2</b>

**Academic Dishonesty:**

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student or possessing unauthorized materials during a test. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another person's as one's own. And, collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Violations will be taken seriously and will be referred to the Dean of Students Office or the Office of Student Conduct and Conflict Resolution for possible disciplinary action. Students may be suspended or expelled from UTEP for such actions. All student writing should be uploaded to blackboard and SafeAssign will check for plagiarism. You can correct or adjust your writing as much as you want, and there is no limit to how many times you can resubmit the assignment, provided that you do so before the posted deadline for the assignment. Please check your documents using SafeAssign, and email me if you have questions or concerns about what is being flagged as plagiarism before you submit your assignment.

**Course Policies:**

You are encouraged to arrive to class on time. Tardiness could result in the loss of participation points, which could impact your grade. Note that the use of laptops is permitted, but not encouraged as scientific evidence shows that using laptops can actually hinder your ability to learn, as well as the ability of those around you. Recording lecture audio or video is not permitted.