# Course Syllabus

✎ Edit

**University of Florida, Psychology Department**

## Neurochemistry, Pharmacology, and Behavior

**PSB 4434,** Class no. 28461, Section no. MS59, 3 Credit hours

**Fall 2024:** In Person.

**Tue** Period 7 (**1:55 PM** - 2:45 PM) **AND 0134**

**Thu** Period 7 - 8 (**1:55 PM** - 3:50 PM) **AND 0134**

Instructor: Marek Schwendt, Ph.D.

**Contact me** via Canvas message (preferred) or via email: **schwendt@ufl.edu (mailto:schwendt@ufl.edu)** .

**Office:** Psychology Bldg, 945 Center Drive, **PSY-324**, Ph. 352-294-3658

**Office Hours:** Monday, P7, 1:55-2:45 PM, or by appointment (Canvas message).

**Teaching Assistant:** Alexandra Sanchez, for contact, use Canvas message.

**Office Hours:** Wednesday, 2-3 pm, **PSY-311G**, or by appointment (Canvas message).

## What is this course about (Course Overview):

This course surveys the neurochemical, physiological, and behavioral effects of the major classes of psychoactive drugs, both therapeutic agents and drugs of abuse. The course includes discussions of drugs' mechanism of action, therapeutic indications, and side effects. Therefore, you can also think of this course as an 'Introduction to Psychopharmacology'.

The course is divided into four **UNITS**:

1. How drugs work. An overview of basic principles of pharmacology with the focus on psychoactive drugs.
2. Drugs and Brain Chemistry. Overview of key neurotransmitters and their receptors, including drugs that alter neurotransmitter function.
3. Drug Addiction. Overview of the main classes of abused drugs, including neural systems involved, addiction processes, possible treatment avenues.
4. Drugs and Brain Disorders. Overview of the symptomology of major psychiatric disorders and the current pharmacotherapies available.

Each unit is further subdivided into **MODULES**. Twenty modules in total. Each module corresponds to a more narrow topic, discussing a specific class of drug or a disease. See the Calendar below for dates and Modules.

## What will you learn (Student Learning Outcomes), and why it matters:

Upon successful completion of this course, students will...

- Show the ability to interpret pharmacological data such as drug half-life, drug tolerance, drug interaction, drug competition, and drug side effects. This knowledge is useful across disciplines and certainly in biomedical science and medicine. However, understanding drug effects and side effects is useful for you as a patient.
- Demonstrate knowledge of the chemical signaling in the brain and its relationship to normal and abnormal behaviors. This is an absolutely fundamental knowledge of how the brain works under normal or pathological conditions.
- Understand how major classes of psychoactive drugs alter brain function and behavior. Even in everyday life, it is useful to quickly understand what is the difference between a depressant, stimulant, or hallucinogenic drug.
- Explain how complex behaviors are studied by neuropharmacologists. This is useful for understanding how to link drug action to a particular behavioral outcome, such as drug action at a receptor and its therapeutic effect.
- Demonstrate knowledge of the chemical and neurobehavioral basis of addiction. Addiction often carries a stigma, or it is blamed on the 'weakness of the character'. It is important to understand that addiction is a disorder and know what are the origins, risk factors, and possible avenues for treatment.
- Demonstrate knowledge of the biobehavioral theories underlying brain disorders, including existing and possible future therapies. Even though our understanding of brain disorders is often incomplete, it is important to understand basic characteristics, possible pathology, and

options for treatment. Perhaps it would help you to understand what a friend or relative suffering from a neurological or mental health disorder is going through.

- Master the skill to identify (online), summarize (in writing), and discuss (in person) original research papers from the field. Even if you are not planning a career in science, scientific literacy is an important skill in today's world that is full of misinformation.

## Course information:

Organization: All twenty topic-specific modules will be posted and made available to students on the course Canvas page within the first 7 days of the semester. Since we will meet on Tuesdays and Thursdays, a new module will typically start with a lecture on Thursday. This lecture will be based on a PowerPoint posted on Canvas. The lectures will be recorded and later posted on Canvas (Zoom Conferences tab). The module will also include additional assignment materials (scientific papers, TED talks, blogs, websites etc.) that are related to the topic lectured. Students need to familiarize themselves with both the PowerPoint and the assigned material. Learning assessment in each module will be based on online multiple-choice and short-answer quizzes (see the calendar below). There will be 10 regular quizzes in total, and each quiz will have 16 questions that will be based on the lecture material and the assignment. The Instructor will provide 3-6 key learning points students should focus on in each posted assignment.

While all modules will be posted at the beginning of the semester, the best way how to keep up with the material and not get overwhelmed is to follow this schedule:

1. Thursday: Attend the in-person class for the lecture and the assignment introduction
2. Thursday - Tuesday: study the most recent material & assignment
3. *Monday: Attend the Instructor's office hours with questions about the material (optional).*
4. Monday-Tuesday: Take the online quiz (between 9 AM Monday - 9 AM Tuesday).
5. Tuesday: Attend the in-person class for the Q&A session covering on the lecture and the quiz.
6. *Wednesday:  Attend the TA's office hours with questions about the material (optional).*

Don't worry, there will be 11 opportunities to take the quiz. The lowest grade will be disregarded, and only 10 grades counted. See the Calendar, Learning Assessment & Grading and Extra credit sections below.

Connectivity and minimum technology requirement:

While this is an in-person course, it is vital to consider the technology needed to have full access to the course and course-related third-party apps.

- A computer (desktop/laptop) or mobile device (smartphone/tablet) that is less than 5 years old will work. NOTE: Chromebooks **are not** recommended and may not be compatible with all third-party tools used in course shells.
- Speakers/headphones/earbuds for listening to audio or videos presented in courses.
- Webcam for interacting in course activities that require video feedback from students, video test proctoring (such as Honor-lock), or other third-party tools.
- An Internet Browser. Note that Google Chrome is required for Honorlock to work!
- Adobe Acrobat Reader (latest version)
- Microsoft Office (includes Microsoft Word, Excel, and PowerPoint).
- A stable and adequately fast Internet connection (30Mb/s +).

E-learning technical support click **here** ⊟ **(https://elearning.ufl.edu/keep-learning/keep-learning-resources/)** and **here (https://ufl.instructure.com/api/ v1/canvadoc_session?blob=%7B%22moderated_grading_whitelist%22:null,%22enable_annotations%22:null,%22enrollment_type%22:null, %22anonymous_instructor_annotations%22:null,%22submission_id%22:null,%22user_id%22:10160000000929103,%22attachment_id%22:51480043, %22type%22:%22canvadoc%22%7D&hmac=5a3cf59d935e681f572a717eb3a873cb9642c9d1)** . Or contact **UF HelpDesk** ⊟ **(https://helpdesk.ufl.edu/)** directly with all your computing and information technology questions.

Prerequisites: It is essential that students enrolled in this course already have a foundational knowledge of psychobiology (the neural basis of behavior, neuronal function, and communication), neuroanatomy (major divisions and organization of the nervous system), and biochemistry (enzymes, chemical reactions in living organisms, chemical formulas). **PSB3340** (strongly preferred) or equivalent.

Textbook (80-90% of the course is based on this textbook):

Meyer, Quenzer:  Psychopharmacology - Drugs, the Brain, and Behavior (4th edition)

ISBN: 978-1605359878 (Course reserve - a copy of the 3rd ed. kept in the Marston Science Library).

Additional reading for those interested in more detail (10-20% of this course is based on this book):

Stahl: Stahl's essential psychopharmacology: Neuroscientific basis and practical applications. (4th Edition, 2013). ISBN:

978-1107686465
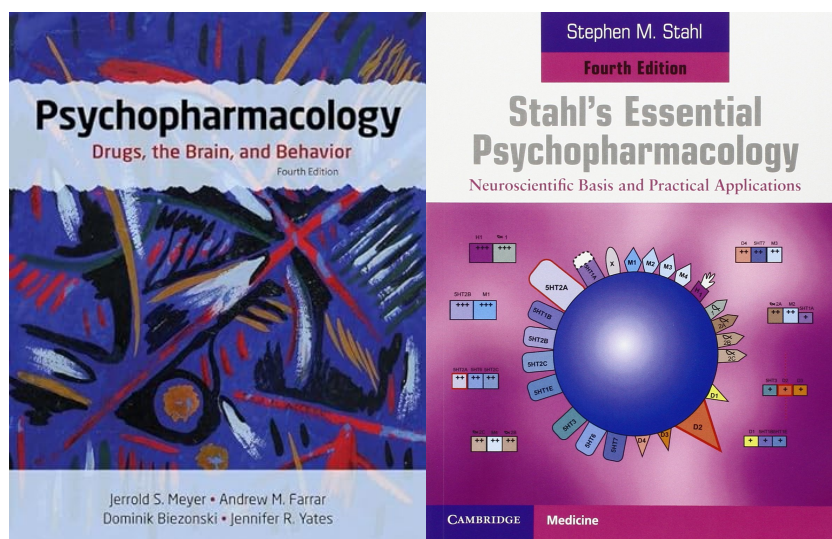
## Course Policies:

**Attendance:** Attendance is strongly encouraged but not tracked or graded.

**Missed quizzes or assignments:** You will have 24 hrs to complete an online quiz. A student must have a note from the Dean of Students office that covers the date of the quiz to be afforded a make-up quiz opportunity at a later date. The scheduling of make-up quizzes will depend on instructor and/or TA availability.

**Academic dishonesty:** Guidelines for this course will follow **The Honor Code** ➾ **(https://sccr.dso.ufl.edu/process/student-conduct-code/)** as published by the University of Florida. *Plagiarism*, *Collusion*, and *Impersonation* are serious, unacceptable offenses and will be punished by receiving a grade of zero for that assignment. The student will receive a failing grade for the course, for repeated (3) offenses. This is how these offenses are typically defined: *Plagiarism* - taking the work of another person or source and claiming it as your own (as paragraphs or sentences, even with slight modification) without acknowledgment of the source through proper referencing. Any submission with Turnitin® similarity scores higher than 20% will be manually checked. *Collusion* - two or more learners collaborating to produce work that is submitted by each in an identical or highly similar submission with the claim that the work was independently completed by an individual learner. We will check for this as well. *Impersonation* - the learner asks someone else to complete all, or part, of their assignment for them and then claims the work as their own. We will use Honorlock® for weekly quizzes.

**Communicating and Learning Online – Netiquette:** It is important to recognize that the online aspect of courses still constitutes a classroom setting, and certain behaviors are expected when you communicate with both your peers and your instructors. For more information, see the **UF Netiquette guidelines.** ➾ **(http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf)**

**Available student support resources:**

Academic support: **UF Office of Academic Support** ➾ **(https://oas.aa.ufl.edu/)**

Students Requiring Accommodations: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the **Disability Resource Center** ➾ **(https://disability.ufl.edu/students/get-started/)** . It is important for students to share their accommodation letters with the instructor and discuss their access needs, as early as possible in the semester.

eLearning support for students: **Keep learning site** ➾ **(https://elearning.ufl.edu/keep-learning/)** .

**On a personal note…** Courses that discuss psychological disorders can touch on personal issues and may make you more sensitive to difficulties in your own life.  Please feel free to talk to me about anything at any time. If you feel like you could benefit from professional counseling, contact the Counseling and Wellness Center at **counseling.ufl.edu/cwc** ➾ **(http://www.counseling.ufl.edu/cwc)** and  392-1575.

## Course evaluation:

During the semester: I would like you to encourage students to let me know their feedback on how the course is going or if they encountered any systemic problems with how the course is taught. I will do my best to address these and correct issues to improve the delivery and student learning process.

Towards the end of the semester: 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/** ⇲ **(https://gatorevals.aa.ufl.edu/students/)** . Students will be notified when the evaluation period opens and can complete evaluations through the e-mail they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via **https://ufl.bluera.com/ufl/** ⇲ **(https://urldefense.proofpoint.com/v2/url?u=https-3A__ufl.bluera.com_ufl_&d=DwMFAg&c=sJ6xIWYx-zLMB3EPkvcnVg&r=y2HjEMjRMHJhfdvLrqJZlYczRsfp5e4TfQjHuc5rVHg&m=WXko6OK_Ha6T00ZVAsEaSh99qRXHOgMNFRywCoehRho&s=itVU46DDJj** . Summaries of course evaluation results are available to students at **https://gatorevals.aa.ufl.edu/public-results/** ⇲ **(https://gatorevals.aa.ufl.edu/public-results/)**

## Learning Assessment and Grading:

You should be able to see all your current grades and grade averages in the **Canvas gradebook (https://ufl.instructure.com/courses/516299/grades)** .

**Online quizzes (100% of the final grade; 10 quizzes, 10% each).** This course will have TEN regular online quizzes. Each quiz will be composed of 16 multiple-choice, fill-in, short-answer questions.  Each quiz will be *primarily (but not exclusively)* based on the material covered since the previous quiz (typically corresponding to one module covered). 5-6 questions can be based on the most recent assignment. If there is no assignment, all questions will be mostly based on the most recent lecture. Quizzes will be available on Monday 9 AM - Tuesday 9 AM. Late submissions will be penalized (see below). We will use Honorlock for these quizzes. Please ensure you are set up and ready to take the quiz beforehand!  **Here are some suggestions. (https://ufl.instructure.com/courses/516299/files/89442730/download?wrap=1)** There will be 11 quizzes in total. The lowest grade will be dropped.

**Late Submissions Penalty:** Quizzes completed after 9 AM on Tuesdays will be subjected to a late submission penalty. After 9 AM, a 25% reduction in total quiz grade will be applied for *every hour* that the quiz is late. For example, a quiz submitted at 9:01 AM is subject to a 25% reduction, whereas a quiz submitted at 11:15 AM is subjected to a 75% reduction.

**Honorlock Violation Penalty:** Reported Honorlock violations are reviewed and subject to an Honorlock Violation policy. If reviews establish a potential violation of the Honorlock rules, such as use of a secondary materials, quiz grades may be reduced by up to 50% per major violation, at the discretion of the TA or (ultimately) the Instructor.

Please see the following website for UF policy on grades:

**UF Graduate Catalog** ⇲ **(https://catalog.ufl.edu/graduate/?catoid=10&navoid=2020#grades)**
**Grades and Grading Policies** ⇲ **(https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/)**

**Extra credit. (+1% to you final grade).** 'New drugs on the block'. Research and write a summary about a new psychoactive drug that has been discovered or introduced in the past 5 years. Describe its discovery, chemical formula, whether it belongs to a certain class of drugs, its major effects and side-effects. Don't forget to mention if it is believed to have potential value in medicine. 500 words, 3+ original sources. Submitted via Canvas. The specific guidelines will be posted on Canvas. The submissions will be checked by TurnitIn for an excessive use of AI tools. Due on 12/4 by 11:59 PM.

**How can you get the best grade possible in this course?** It might sound obvious, but trust me…it works! The best way is to keep up with the lecture material and ask questions whenever something is unclear. The Instructor or the TA will offer answers to students' questions in three different ways: 1) Submit your question as a Canvas message. You will receive a personalized response. 2) Join the Instructor or the TA during their posted office hours. You can send your questions to our TA or me beforehand.

**Grading scale:**

93 - 100.0      A

90 - 92.9      A-

87 - 89.9      B+

83 - 86.9      B

80 - 82.9      B-

77 - 79.9      C+

73 - 76.9      C

70 - 72.9      C-

67 - 69.9      D+

63 - 66.9      D-

60 - 62.9      D

Less than 60    E

**Notes on rounding up the grade:**

- In general, I will **NOT** round up the grades beyond what is written on the grading scale. However, minor adjustments will happen: For example, 89.91% = 90% = A-, because 89.9% is the ceiling for B+. Using the same logic, 89.85% is a B+ without a doubt.
- "Rounding up debate" can go on forever e.g., if 89.5% is rounded up to 90% or A-, there will be students with 89.4% feeling that they were "close enough" to the threshold (89.5%) to earn A- as well. So, rounding is not the issue. It's about drawing an arbitrary line in the sand, making it clear that although it's arbitrary, it's the same line for every student.
- Finally, this year, I offer 1 additional quiz (that can be used to erase your lowest grade) and 1 extra credit. So, if your grade is 89.85%, you most likely already took advantage of this to boost your overall score. Unfortunately, this wasn't enough to get you an A-, but without this option, you would be a solid B+.

## Calendar (subject to change).

| Week | Dates | Day | Module | Unit / Lecture topic / Textbook chapter | Quiz |
|---|---|---|---|---|---|
| | | | | **UNIT - How Drugs Work** | |
| **Week 1** | 8/19 - 8/25 | | | | X |
| | | Thu | Mod 1 and 2 | Welcome & Course info. Introduction to Psychopharmacology. Pharmacokinetics (Ch.1) | |
| | | | | | |
| **Week 2** | 8/26 - 8/30 | Tue | Mod 2 and 3 | Pharmacokinetics (Ch.1) and Pharmacodynamics (Ch.1) | Practice Quiz |
| | | Thu | Mod 3 and 4 | Pharmacodynamics (Ch.1) and Receptors, Transporters, Enzymes as drug targets (Ch.3) | |
| | | | | | |
| **Week 3** | 9/2 - 9/6 | Tue | | Paper Discussion 1 - Principles of Pharmacology | Quiz 1 (Mod 1-4) |
| | | | | **UNIT - Drugs and Brain Chemistry**  (Mod 5 is a brief Introduction to the unit) | |
| | | Thu | Mod 6 | Catecholamines (Dopamine, Norepinephrine, Ch.5) | |
| | | | | | |
| **Week 4** | 9/9 - 9/13 | Tue | | Paper Discussion 2 - Catecholamines | Quiz 2 (Mod 6) |
| | | Thu | Mod7 | Serotonin (Ch.6) | |
| | | | | | |
| **Week 5** | 9/16 - 9/20 | Tue | | Paper Discussion 3 - Serotonin | Quiz 3 (Mod 7) |
| | | Thu | Mod 8 | Acetylcholine (Ch.7) | |
| | | | | | |
| **Week 6** | 9/23 - 9/27 | Tue | | Paper Discussion 4 - Acetylcholine | Quiz 4 (Mod 8) |
| | | Thu | Mod 9 | Amino Acids (GABA, Glutamate, Ch. 8) | |
| | | | | **UNIT - DRUG ADDICTION** | |
| **Week 7** | 9/30 - 10/4 | Tue | Mod 10 | Drug Addiction - Introduction (Ch.9) | X |
| | | Thu | Mod 11 | Alcohol (Ch.10) | |
| | | | | | |
| **Week 8** | 10/7 - | Tue | | Paper Discussion 5 - Alcohol | Quiz 5 (Mod 9-11) |

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|---|---|---|---|---|---|
| | 10/11 | Thu | Mod 12 | Opioids (Ch.11) | |
| | | | | | |
| Week 9 | 10/14 - 10/18 | Tue | | Paper Discussion 6 - Opioids | Quiz 6 (Mod 12) |
| | | Thu | Mod 13 | Psychostimulants (Ch.12,13) | |
| | | | | | |
| Week 10 | 10/21 - 10/25 | Tue | | Paper Discussion 7 - Psychostimulants | X |
| | | Thu | Mod 14 | Cannabinoids (Ch.14) | |
| | | | | | |
| Week 11 | 10/28 - 11/1 | Tue | | Paper Discussion 8 - Cannabinoids | Quiz 7 (Mod 13-14) |
| | | Thu | Mod 15 | Hallucinogens (Ch.15) | |
| | | | | **UNIT - Drugs and Brain Disorders** | |
| Week 12 | 11/4 - 11/8 | Tue | Mod 16 | Drugs and Brain Disorders - Introduction | Quiz 8 (Mod 15) |
| | | Thu | Mod 17 | Anxiety Disorders (Ch.17) | |
| | | | | | |
| Week 13 | 11/11 - 11/15 | Tue | | Paper Discussion 9 - Anxiety | Quiz 9 (Mod17) |
| | | Thu | Mod 18 | Affective Disorders (Ch.18) | |
| | | | | | |
| Week 14 | 11/18 - 11/22 | Tue | | Paper Discussion 10 - Affective disorders | Quiz 10 (Mod 18) |
| | | Thu | Mod 19 | Schizophrenia (Ch.19) | |
| | | | | | |
| Week 15 | XXX | | | *Thanksgiving week - no classes* | |
| | | | | | |
| Week 16 | 12/2 - 12/6 | Tue | Mod 20 | Closing remarks, Q & A | |
| | | Wed | | | *Quiz 11 (Mod 19 + general concepts of everything) |
| | 12/6 | | | Faculty/Course Evaluation Period Closes | |
| | 12/9 | Thu | | Final exam (Exam 4) | |
| | 12/16 | | | Grades due | |

**Disclaimer:** This syllabus represents my current plans and objectives.  As we go through the semester, those plans may need to change to enhance the class learning opportunity.  Such changes, communicated clearly, are not unusual and should be expected.

Last update:  8/14/2024