



NSC 3630

DRUGS & BEHAVIOR



DR. MEREDYTH WEGENER



TUESDAY/ THURSDAY

11-12:15 PM

WILSON 103



SPRING 2023

This course is designed to give students a comprehensive understanding of the inner workings of major neurotransmitter systems in the brain through manipulation of those systems by recreational and therapeutic drugs. We will also apply concepts of competitive, uncompetitive, and mixed inhibition to understanding the effects of exogenous agonists and antagonists on neurotransmitter receptors. Students will learn how drugs interactions with their targets affect behavior to cause intended effects and side effects. Additionally, we will examine the methods behind how we study the effects of psychoactive drugs and what conclusion we can draw based on the data collected in those experiments. Please note: While some topics in this class are a MUST, I am happy to adjust which drugs are discussed based on the student interest and the exact makeup of the class.

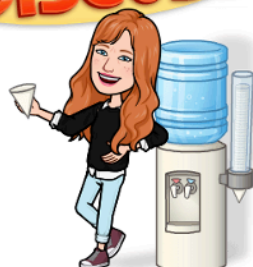
Learning Objectives:

Since Drugs & Behavior is an elective, we can define objectives ourselves. I would love to hear of any goals you would like to incorporate in the course. I will do anything I can to provide that opportunity. Below is a list of potential goals I had in mind when I designed the course, as a place for us to start.

Students who successfully complete this course will be able to:

- Differentiate between receptor types, and examine how each receptor type achieves its effects.
- Distinguish the major classes of drugs, describe their mechanism of action and explain how that leads to the drugs neurochemical and behavioral effect.
- Predict how manipulating one component of the synapse will affect overall synaptic transmission.
- Explain how we study the effects of drugs and their addictive potential.

let's
DISCUSS



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OPEN DOOR HOURS: THURSDAY 2-4PM OR BY APPOINTMENT

I'D LOVE TO MEET WITH YOU!

PROFMWEGENER.YOUCANBOOK.ME

TO TALK ABOUT CLASS, BOARD GAMES, RESEARCH, CAREER PLANS, MY DOG OXFORD, PEDAGOGY, PROCRASTINATION, AND WHATEVER INTERESTS YOU.

Students who complete this course will be able to:

- Demonstrate knowledge of and the ability to apply the learning objectives listed on the previous page.
- Be able to work effectively in a team and in a group, including explaining complex ideas to colleagues, asking for help from your colleagues, contributing to the problem-solving process, and listening attentively to others.
- Think like a scientist and be able to dive deep into a scientific problem on one's own or as a team
 - o Become familiar with scientific methodology.
 - o Understand and evaluate the evidence behind scientific theories about drug mechanisms.
 - o Be able to evaluate a scientific study identifying: hypothesis being tested, assumptions made, expected outcomes, data and analysis, interpretation of results, link to hypothesis, and follow-up questions to ask.
 - o Build an understanding of commonly used methods for studying brain function and dysfunction in humans and animals.

How to succeed in Drugs & Behavior:

- **Come with questions about the readings, assignments, or lectures.** It is vitally important to everyone's success in the class that we spend as much of the class time going over the most interesting and challenging concepts. If we spend most of the class discussing things that everyone understood from past courses or experience and then only a small amount of time quickly covering the parts that made no sense, then you will struggle on those issues in the exams, projects, and presentations; worse, you may never get the chance to explore them together.
- **Ask questions in course meeting.** Whether these are for clarification, repetition, or because you're interested and want to know more, student questions make for a better learning environment for all.
- **Review/think about/talk about what was covered in lecture and in class.** In addition to simply showing up for meetings, this class will require that you spend time between lectures looking over your notes, assigned papers, and thinking about what was discussed. One way you may spend this time is discussing material with group members or finding/sharing links to our work in social media, popular press, or current public health events.
- **Contact the instructor.** Send e-mail any time. I will do my best to answer in 24-48 hours but answering emails promptly is not my strong suit so feel free to follow up if I fall behind. Communication is going to be absolutely crucial in our current educational circumstances so call me out if I am not doing my part. Call or visit during open door hours to discuss the course. Open Doors hours are times that I am available to answer questions, discuss your future career plans, or just chat. This is your time to utilize me as a resource to learn more and explore your interests. Additionally, it can be a great way to get more casual time with your classmates or whoever wanders in. Appointments are not necessary. If you would like to set up an individual private meeting, use [YouCanBookMe](#) to add yourself to my calendar at a time that works for you. You should also use this link to set up a meeting if I do not answer an email quickly enough.

Responsibilities

The choice to take this course is entirely up to you. If you do choose to take the course, please do your best to attend all course meetings and participate enthusiastically in class activities. This course follows an interactive small-group model, so your active engagement will vastly improve your experience and that of your classmates. In turn, I will make every effort to build a valuable learning experience for every student. If there is ever any way I can improve your learning, or if any topic doesn't capture your interest and you would like to propose an alternative, I welcome feedback (either in class, outside of class, or anonymously).

Finally, it is everyone's responsibility to be respectful of others during class. In science we often require discussion and reexamination before understanding where we went wrong. We learn valuable information and skills from our mistakes, discourses, and continued effort to master related content. Additionally, we do not always realize we are mistaken until we say something aloud and are allowed a chance to correct our own comprehension. I expect all members of this class to be aware of this and embrace it as a valuable experience.

Absolutely nothing is more important than your health and well-being.

If you find that you are falling behind or struggling in class due to mental health issues, sexual assault or partner violence, family responsibilities, inability to find safe stable housing or food, please reach out so I can support you. You do not need to provide details if you are not comfortable but knowing whether the problem is short term or ongoing is helpful. For additional information and support, please contact Center for Student Wellbeing (healthydores@Vanderbilt.edu 615-322-0480), Project Safe Center (projectsafe@Vanderbilt.edu 615-322-7233), or Student Care Coordination (studentcare@Vanderbilt.edu 615-343-9355)

Class Policies

Academic Integrity: Vanderbilt's Honor Code governs all work in this course. If you have any questions about how the Honor Code applies, please ask Dr. Wegener -- not another student or the T.A. -- for clarification. Uncertainty about the application of the Honor Code does not excuse a violation. Anyone who violates the Vanderbilt Honor Code will be dealt with as the Honor Council deems appropriate. There are no exceptions.

- **Cheating.** Cheating of any sort will not be tolerated. For example, if quiz or exam answers are copied from another student or everyone in your group uses the same answer instead of using your own words, both students will receive zeros; if graded exams or homework assignments are altered and resubmitted for a higher score without explicit use of an Oops token, the revised score will be zero. In addition, these and other forms of cheating may also be referred to the Office of Student Accountability for more severe penalties. This warning has two purposes: 1) to dissuade a small number of students from even thinking about cheating; and 2) to persuade the large majority that they will get a fair grade based on their individual performance.
- **Plagiarism.** Cheating also includes plagiarism, the presentation of the work of another person as one's own. This applies whether the source of the material is a printed book, a web site, or work of another student from this course or any other course. Lifting even a single sentence without appropriate attribution constitutes plagiarism.

A PIECE OF ADVICE: If you ever feel the slightest bit tempted to engage in academic dishonesty in this course to earn a better grade, please set up a meeting with me through <https://profmwegener.youcanbook.me/> and we can discuss strategies and approaches to help you achieve the grade you want to earn.

If you cheat instead of reaching out, you are risking all you have already accomplished at Vanderbilt. Additionally, you are sacrificing my trust and force us both into the terrible bureaucracy and emotional stress of an academic integrity inquiry. Please don't. Life is hard enough.

Ability and Disability (as taken from Vanderbilt's Center for Teaching): This class respects and welcomes students of all backgrounds, identities, and abilities. If there are circumstances that make our learning environment and activities difficult, if you have medical information that you need to share with me, or if you need specific arrangements in case the building needs to be evacuated, please let me know. I am committed to creating an effective learning environment for all students, but I can only do so if you discuss your needs with me as early as possible. I promise to maintain the confidentiality of these discussions. If appropriate, also contact Student Access Services to get more information about specific accommodations.

Due dates in this course can be considered as “Best By” dates, designing to keep everyone on track and make assessment and feedback manageable and timely. If you aren’t going to make a due date, that’s totally fine. Hard deadlines are in place to serve as external motivation and structure. We don’t want anyone to be left with left with an entire semester of work in the last 2-3 weeks. If you do need more time, please use [Extension Request Form](#) communicate your new deadline.

EVALUATING WORK IN



DRUGS & BEHAVIOR

How molecules work in the brain can be complicated. We are exploring our understanding and growth as a learner in multiple ways this semester. This describes the plan for how progress will be assessed in this course.

TOPHAT IN-CLASS QUESTIONS

In order to practice key skills and ensure everyone understands as we go, each lecture will be accompanied by TopHat questions throughout the meeting. You will be asked to consult with your group member and submit individual responses. These questions will be answered thoughtfully in class and will be evaluated on completeness.



Worth 100 points total (at least 115 points offered).

CASE STUDIES



Examine a real-life scenario to explore more about the content and concepts we learn about in lecture. Work on it with your group and answer in your own words. We will complete 3 cases. The value of each case will increase through the semester. Feedback will be offered on these 3 cases along with a score from a standardized rubric.

1 set of Discussion Questions: 10 points
3 Case Studies: 120 points total

GROUP EVALUATIONS

Throughout the semester, you will work with 3-4 of your classmates to complete case studies and consider in-class questions. This group will serve as your support within our larger class community. Twice during the semester, you will assess you and your group members' contributions to the community. These will be reviewed on a sufficient/insufficient basis for thoughtful completion.



2 Reflections: 20 points total

CHECKPOINTS



Three times throughout the semester, you will demonstrate your individual understanding of the previous unit. Each Checkpoint will cover 3-4 modules and include some material from previous checkpoints to ensure retention. Checkpoints will consist of multiple choice, short answer and diagram questions. You can bring one page of notes (front and back) to aid you.

3 Checkpoints: 150 points total

Compassionate grading is important to me. I offer this structure so students know what to expect. If we need to shift this plan to better serve your learning, please collaborate with me to design an alternative.

- **TopHat Review Quizzes.** Please follow these [Student Join Course Instructions](#) and our course code (**Course Code: 818733**) to join. You will also receive an email from me inviting you to join the course. Over the semester, at least 115 points will be offered through TopHat, but you only need to earn 100 points to get full credit for this category. That way, if you need to miss class or choose not to attend, you have at least 15 points of cushion before it begins to affect your grade. Please note that you need to be in-class to answer TopHat questions unless you have an accommodation that you have discussed with me.

- **Case Studies.** Case studies provide great practice for extracting important information, identifying gaps in knowledge, and forming logical conclusions. We will use case studies to study the mechanism and issues surrounding specific drugs more in depth and use them as apply concepts in class to more real-world situations. You will work with your small group to complete the case studies, compare answers, and discuss possibilities. One set of discussion questions will be assessed on completion (10 points each) with minimal feedback. As the semester progresses, cases will be worth more to acknowledge the learning process and improvement efforts. These 3 cases will be assessed by rubrics of increasing value (1st case: 20 points; 2nd case: 40 points; 3rd case: 60 points). We will provide significant feedback on each of these 3 cases and you will be asked how you've addressed that feedback in the next case.

Continuations of case studies may appear on checkpoints to test your understanding of main issues covered by the case study as well as your ability to apply the skills from the case study to new questions.

- **Checkpoints.** There will be a total of 3 checkpoints across the course. The 3 checkpoints will be worth 50 points each for 150 points total. The cumulative final exam is optional, but if you do choose to take it, it will replace your lowest

checkpoint grade, even if the grade on the final is lower. There is no guarantee of improvement here but an additional opportunity to demonstrate skill and knowledge if you would like to take it. Checkpoints will take place during class time via Brightspace and include multiple choice, short answer, and diagram questions on material covered in lecture. You can bring a one-page note sheet (front and back) to include any information you would like to have during the checkpoint. Graded checkpoints will be available during office hours if you would like review and discuss to specifics of your performance. If you would like to discuss alternative weighting of checkpoints, I am happy to meet with you so we can make a plan together to best assess your progress in the course.

- **Group evaluations and reflections.** Participation in your small group is crucial to the course. Students who commit to their group by showing up regularly, getting help, and offering support to others usually do better in the course. Additionally, students report that their group improves their course experience, bringing joy into our community and support in our struggles. You will be asked to reflect on your contributions to the group and evaluate your colleagues two times throughout the semester. These will be assessed on thoughtful completion for 10 points each (20 points total).
- **Exam re-grades.** We are committed to grading as fairly as possible. If you think a mistake was made in the assessment of your work, you can contact me with a written explanation of why you think the work was misrepresented and your work will be re-examined. Any concerns or disputes must be submitted **no more than five days** after assignment has been returned. The instructors reserve the right to re-assess the entire assignment in addition to the disputed question.

A	93.50-100	B-	80-82.99	D+	67-69.99
A-	90-93.49	C+	77-79.99	D	63-66.99
B+	87-89.99	C+	73-76.99	D-	60-62.99
B+	83-86.99	C-	70-72.99	F	0-59.99

Week	Day/Date	Topics
1	1/10 T	Module 1.1: Introduction to Course
	1/12 Th	Module 1.2: Synaptic Components & Transmission
2	1/17 T	Module 2.1: Pharmacology
	1/19 Th	Module 2.2: Drug Types
3	1/24 T	Module 3.1: How We Study Drugs
	1/26 Th	Module 3.2: Substance Use Disorder
4	1/31 T	Review & Dr. Hart Discussion
	2/2 Th	CHECKPOINT 1
5	2/7 T	Module 4.1: Psychostimulants
	2/9 Th	Module 4.2: Psychostimulant Research
6	2/14 T	Module 5: Anti-Psychotics
	2/16 Th	Module 5: Psychiatry & Dopamine Case Study
7	2/21 T	Module 6: MDMA
	2/23 Th	Module 7: Hallucinogens

8	2/28 T	Review & Catch-Up
	3/2 Th	CHECKPOINT 2
9	3/7 T	Module 8.1: Alcohol
	3/9 Th	Module 8.2: Alcohol Questions
March 13-19: Spring Break!		
10	3/21 T	Module 9: Benzodiazepines
	3/23 Th	Benzodiazepine Case Study
11	3/28 T	Module 10.1: Cannabis
	3/30 Th	Module 10.2 Cannabis Questions
12	4/4 T	Module 11: Adenosine and Caffeine
	4/6 Th	CHECKPOINT 3
13	4/11 T	Module 12.1: Opioid Neurotransmitter System
	4/13 Th	Module 12.2: Opioid Use Disorder
14	4/18 T	NAS Case Study
	4/20 Th	Module 12.3: Pain Management and Review
FINALS	5/3 W	Optional Cumulative Final Exam: May 3