

NSC 4363.002—Neuropharmacology—Spring 2025

Tues & Thurs 4:00-5:15pm, CR 1.202

Professor **Amy Zwierzchowski-Zarate, PhD** (she/her) amy.zwierzchowski@utdallas.edu
Student Visiting Hours - Thursdays 1:00-2:30pm in JO 3.314 (or Teams meeting if announced prior in eLearning), or you can send an email if another time to meet is needed.

Email Communication - To comply with FERPA you must use your official UTD email to reach me. Include the course name in your email. I always try to get back to you within 3 working days under normal circumstances, so if you have not received a reply from me, please try again after a few days. I will appreciate the gentle reminder.

Graduate TA **Navi Lanka** Jahnvi.Lanka@utdallas.edu Student Visiting Hours - TBD

Undergrad TAs **Diya Khullar** Diya.Khullar@utdallas.edu
 Sanjay Shori Sanjay.Shori@utdallas.edu Weekly Review Sessions - TBD

You matter. Your voice and opinion are important and valuable. You belong here.

I care deeply about your success in this course and am here to support your success in every way that I can. Your determination and engagement with this course are essential to your success. I also understand that many students can face obstacles to their education as a result of work or family obligations or unforeseen personal difficulties. This course is designed to allow you to be successful even if you encounter unexpected obstacles.

If you are experiencing challenges throughout the term that are impacting your ability to succeed in this course, or in your undergraduate career more broadly, resources are available to help you overcome these obstacles. [The Graduation Help Desk](#) can connect you to these resources whether they are related to study skills, managing your time, referrals to counseling, secure food or housing, or general personal and academic issues. You can reach someone at graduationhelpdesk@utdallas.edu. Please also reach out to me as soon as possible so that we can work together to form a plan for your academic success. If you are unable to attend my student visiting hours, please email me to set up a time that works for you or arrange a meeting by Teams.

Prerequisite

NSC 4352 or 4354

Course Description

Neurobiology of neurotransmission in nervous systems. Includes ionotropic and metabotropic coupling of receptors to both cellular and system effects. Clinical efficacy, side effects, and other issues related to drug use and abuse are covered. The course introduces and discusses in depth major areas of neuropharmacology: (1) bioavailability of compounds that we class as drugs (i.e. those compounds with receptor mediated actions); (2) cellular mechanisms that produce drug actions in the nervous system and its targets; (3) specific drug effects (and side-effects), divided topically by receptor type. Agonist, antagonist, and mixed effects will be discussed and analyzed from molecular to behavioral levels, with examples of experimental and clinical use.

PHOTOGRAPHY/VIDEOGRAPHY/AUDIO RECORDINGS STRICTLY PROHIBITED IN CLASS

Course Format

This course is an in-person course. Lectures are not recorded. Recording any portion of lectures is a violation of FERPA and the Student Code of Conduct.

I do not take attendance, however, attendance of classes is strongly recommended, as tests will be based on material taken from the classes and will not be restricted to the topics and textbooks indicated in this syllabus, which serves predominantly as a guideline to the course. If you must miss a class lecture, it is your responsibility to reach out to others in the course, including TAs, to catch up on missed materials.

Learning Objectives

After taking this course, you should be able to:

- ◆ Describe and analyze major concepts, theoretical perspectives, empirical findings, and historical trends in cognition and neuroscience.
- ◆ Use proper scientific terminology for neurotransmitters, neurotransmitter receptors, and neurotransmitter receptor/effector signaling systems.
- ◆ Assess interactions of specific ligands (drugs) with specific neurotransmitter systems.
- ◆ Describe how current methods can limit our understanding of nervous systems but drive innovation to develop better techniques.
- ◆ Integrate clinical findings from psychology, psychiatry, physiology, and neurology with basic scientific work in the neurosciences.
- ◆ Identify appropriate applications of pharmacological knowledge in health, service, education, or business professions.
- ◆ Demonstrate how neuroscience research findings can contribute to understanding behavioral and social issues and can aid public policy.

Course Materials

1. Recommended Textbook: *Molecular Neuropharmacology (Nestler et al.)*, 3rd or 4th ed., McGraw-Hill
2. Other readings if needed will be posted on eLearning
3. Class discussion slides will be posted in eLearning prior to class. Slides are for your own use to aid your learning in this course. No portion of these slides may be sold, retransmitted, reposted, duplicated or otherwise used without the express written approval by me. Reposting these slides online or reusing these slides for other purposes is prohibited and will result in a violation of the [Student Code of Conduct](#).
4. **Bring a notebook or paper and something to write with every day.** You will need 8.5x11" paper (regular notebook paper size) to turn in, and a pen/pencil to write with.

The texts and any additional assigned readings serve as background material for our class discussion, not as a final voice of authority. Neuropharmacology is a rapidly advancing field, and textbooks (unfortunately) cannot be revised quickly enough to keep up.

The primary sources of information for this course are the lecture slides and class discussions.

Course Access

All course materials, announcements, and any other official content will be accessible via the eLearning website.

Course Communication

This course utilizes online tools for interaction and communication. Some external communication tools such as regular email will also be used during the semester. Announcements will be made via eLearning, email, and in class. In the event of emergencies, such as lecture cancellations, I will send emails via eLearning to everyone in the class. Grades will be posted as soon as they are available.

To comply with FERPA regulations, all email discussions to and from me **MUST** be through e-learning. This is to protect your privacy. Discussion boards and Chat are available for your use. I will not routinely monitor them unless I receive complaints about inappropriate posting.

Teaching Team

This course utilizes a teaching team comprised of undergraduate and graduate TAs to help connect every student with the support they need to be successful.

Reach out to any TA for questions about content and assignments. Undergraduate TAs are selected for their stellar performance in recent sessions of this same course – they are an invaluable resource to you. Graduate TAs are another incredible source of information, they can also help review exams with you.

Please make use of your excellent Teaching Team with any questions about this course that you have.

NSC4363.002 Spring 2025 Neuropharmacology Class Schedule

(Subject to change at the discretion of the Professor)

Week	Day	Date	Topic	Chapter	DUE in class	DUE in eLearning before 11:58pm on Monday
1	Tues	1/21	Course Introduction & History of Neuropharmacology			
	Thurs	1/23	Pharmacokinetics & ADME	1		A1 due 1/27
2	Tues	1/28	Mechanisms and Targets of Drug Action	1	Q1	
	Thurs	1/30	Pharmacodynamics & Ligand/Receptor Complexes	2		A2 due 2/3
3	Tues	2/4	G-Proteins & Second Messengers	2	Q2	
	Thurs	2/6	Review & Project Progress			
4	Tues	2/11	EXAM 1 in TESTING CENTER (2/11-2/12)			
	Thurs	2/13	Voltage Gated Channels, NT Release	3		A3 due 2/17
5	Tues	2/18	Acetylcholine I	3	Q3	
	Thurs	2/20	Acetylcholine II	3		A4 due 2/24
6	Tues	2/25	Glutamate I	2	Q4	
	Thurs	2/27	Glutamate II	2		A5 due 3/3
7	Tues	3/4	Glycine & GABA		Q5	
	Thurs	3/6	Review & Project Progress			
8	Tues	3/11	EXAM 2 in TESTING CENTER (3/11-3/13)			
	Thurs	3/13	Project Progress Day - NO CLASS			
9	Tues	3/18	NO CLASS - University Holiday (Spring Break)			
	Thurs	3/20				
10	Tues	3/25	Dopamine I	6		
	Thurs	3/27	Dopamine II	6		A7 due 3/31
11	Tues	4/1	Norepinephrine	6	Q6	
	Thurs	4/3	Serotonin	6		A8 due 4/7
12	Tues	4/8	Histamine & Orexin	7	Q7	
	Thurs	4/10	Review & Project Progress			
13	Tues	4/15	EXAM 3 in TESTING CENTER (4/15-4/17)			
	Thurs	4/17	Headaches & Headtrips	8		
14	Tues	4/22	Endocannabinoids	8	Q8	
	Thurs	4/24	Opioids			A9 due 4/28
15	Tues	4/29	Drug Regulation & Review		Q9	
	Thurs	5/1	EXAM 4 in TESTING CENTER (4/30-5/2)			
16	Tues	5/6	Review for Final			
	Thurs	5/8	FINAL EXAM in TESTING CENTER (5/7-5/9)			FINAL PROJECT

Schedule: This schedule is *tentative*. There may be unforeseen outside factors (e.g., illness) that necessitate adjustments to this schedule, including the dates of reviews and tests. Any such adjustments will be announced in class and via email.

All descriptions of the didactic material and the timelines are subject to change at the discretion of the instructor. The information in the following link constitutes the University's policies and procedures segment of the course syllabus: Please go to <http://go.utdallas.edu/syllabus-policies> for these policies.

Grading Policy

Letter grades are assigned as follows - 97-100% = A+, 94-96.9% = A, 90-93.9% = A-, 87-89.9% = B+, 84-86.9% = B, 80-83.9% = B-, 77-79.9% = C+, 74-76.9% = C, 70-73.9% = C-, 67-69.9% = D+, 64-66.9% = D, 0-63.9% = F

Grades will not be rounded up and no extra credit will be given to individuals. Please do not make an awkward situation by asking.

I provide multiple opportunities for students to receive feedback on their performance throughout the course to give students opportunities to see how they are doing and identify places they need to apply more effort or new strategies along the way, seek help if they are struggling, and improve throughout the semester. My hope is that all students will develop the knowledge they need to do well in this course and that all students—even those who perform well early in the semester—will improve and develop greater knowledge and skills through practice on the quizzes and exams. Students earn the grades they receive; I do not curve grades or add extra points or extra credit in this course because I do not believe students grades should be tied to other students' grades (on a curve) and because there are plenty of opportunities for students to improve their grades throughout the semester with the quizzes, assignments, and exams.

At the end of the semester, I calculate your grade using all 4 grading schemas → You get the best grade.

Whichever grading schema results in the best possible grade outcome you have earned, is the one that will be used to calculate your final grade in this course.

	GRADING SCHEMAS			
	I	II	III	IV
Exams (Best 4 out of 5)	80%	85%	85%	90%
Quizzes (in-class)*	5%	0%	5%	0%
Homework Assignments**	5%	5%	0%	0%
Final Project	10%	10%	10%	10%
TOTAL	100%	100%	100%	100%

*drop 2 lowest automatically

**drop 1 lowest automatically

Other Course Policies

Extra Credit

No individualized extra credit is available. Focus on doing your best on the existing assignments and exams. If you are concerned about learning, talk with me early in the semester. If you wait until the end, there will not be time to help you.

Classroom Community

You should feel free to ask questions and express ideas about the subject matter. Your voice and opinions matter. I strive to create an environment where diverse perspectives are valued. There may be disagreement with opinions shared by your peers. Respectful disagreement can lead to fruitful debates of course materials. Disrespectful discourse and disrespect of others will not be tolerated.

Class Participation

Attendance of classes is strongly recommended, as tests will be based on material taken from the classes and will not be restricted to the topics and textbooks indicated in this syllabus, which serves predominantly as a guideline to the course.

No Hassle Exam Policy

Only your 4 highest exams will be counted. You have 4 midterm exams and 1 cumulative final exam, but only 4 exams will count toward your final grade in this course. This means if you must miss an exam, just move forward and complete the other exams. **You need to take at least 4 out of the 5 total exams. If you take all 5 exams, the lowest score will automatically be dropped.** Plan to take all exams.

There will be **NO Make-up exams** EXCEPT for the following situations –

1. You are seriously ill during the entire window of the exam and have **verifiable documentation** from a licensed physician.
2. You were legally detained during the entire window of the exam and have **verifiable documentation**.
3. You have made **prior, approved** arrangements to attend a **verifiable** academic conference, religious, or other unavoidable event.

In ALL cases you must notify the instructor at least 4 hours prior to the scheduled exam using your UTD email. Otherwise, you will receive a ZERO (0) for that exam. A single make-up exam will be scheduled within 1 week of the original exam date. All make-up exams will be in essay format.



IMPORTANT TIPS FOR SUCCESS

The Testing Center requires that you SUCCESSFULLY register for each exam at least 48 hours in advance of your exam time. It is not sufficient if you TRIED to register for the exam at least 48 hours in advance.

Failure to adequately register for an exam is not an acceptable reason to request a make-up exam.

Be sure to verify that you correctly completed your registration for each exam in the Testing Center and print the proof if you can. If you need to cancel and reschedule, do so by following the instructions to cancel and reschedule, NOT by attempting to register again for the same exam.

You must register well in advance—don't wait until only 48 hours before your hoped-for exam time.

Assignments

EXAMS

Four midterm exams and 1 cumulative final exam will be given. I will take your 4 highest exam grades to count toward your final grade. **All exams are held at the UTD Testing Center – Register now at <https://ets.utdallas.edu/testing-center/>.**

The Testing Center requires you to reserve your exam slot at least 48 hours ahead of time. You must bring your Comet Card to the Testing Center – no exceptions. To reserve your seat and view guidelines for students, visit - <https://ets.utdallas.edu/testing-center/students>.

Material for exams is largely taken from class lectures/discussions. Exam questions are designed to be challenging and to encourage integrative thought about the material, including applying concepts discussed in hypothetical situations. Question format may include matching, fill-in-the-blank, short answer, and multiple choice. You will be given 75 minutes at the Testing Center to complete your exam.

HOMEWORK ASSIGNMENTS

Homework is assigned throughout the course. These are designed to prepare you for exams, and most importantly, think critically and connect to material beyond the classroom.

Homework will be due before 11:58pm on Mondays in eLearning. There are NO make-up assignments. I drop your 1 lowest homework grade automatically. Additionally, there are 2 grading schemas where homework counts as 0% of your final grade. Plan to complete all homework assignments as they are designed to help you understand and apply the material from this course.

QUIZZES

There is a quiz every week covering the material from the previous week. If you do all your homework and understand the material, there is no reason for you not to do well on the quizzes. I assign these quizzes for two reasons. One is to show me how well students understand the material, whether there are some students who are not there yet, and whether I need to review certain concepts with the class. The other reason is to let you assess how well you are understanding the concepts and where you need to focus more of your efforts to learn the course material. If you are struggling on the quizzes, it means that you need to seek help from me, one of the TAs, the Department resources listed in this syllabus, or your peers, so that we can help you learn the material.

Quizzes are given in-class. There are NO make-up quizzes. I drop your 2 lowest quizzes automatically. Additionally, there are 2 grading schemas where quizzes count as 0% of your final grade. Plan to take all quizzes as they are designed to help you check your understanding of course material.

FINAL PROJECT

One final project will be completed and DUE before 11:58pm Thursday, May 8th. Limited time to discuss and work on projects is allotted in the course schedule, plan to spend the majority of time working on your project outside of class time. Your final project comprises 10% of your final grade in this course in ALL grading schemas.

Projects are ways to demonstrate understanding of material above and beyond exam questions. You will investigate an instructor approved neuropharmacological topic of your choice that ties into what we have discussed in class and how it relates to human issues (disease, ethics, politics). Cite any sources you use.

You may work independently OR in a group of up to 3 people. There are different guidelines depending on whether you choose to do an individual project or work in a group. Group projects must constitute a significant final product above and beyond what an individual contribution would entail. See rubric on Project handout in eLearning for full details.

OTHER IMPORTANT INFORMATION

Academic Integrity

Academic Dishonesty including but not limited to cheating on exams and sharing or posting exam questions (with or without the correct answers) will not be condoned in my class or at UTD. Any action deemed as potential academic dishonesty will be reported to the Office of Community Standards and Conduct for official review.

Academic Support Resources

The information contained in the following link lists the University's academic support resources for all students. Please go to [Academic Support Resources](#) webpage for these policies.

Student AccessAbility (ARC): It is the policy and practice of The University of Texas at Dallas to make reasonable accommodations for students with properly documented disabilities. However, written notification from the [Office of Student AccessAbility](#) is required. If you are eligible to receive an accommodation and would like to request it for this course, please discuss it with me and allow *at least one week* advance notice. I want to help every student succeed, but have to have time to prepare to help you. Students who have questions about receiving accommodations, or those who have, or think they may have, a disability (mobility, sensory, health, psychological, learning, etc.) are invited to contact ARC: in person at the Administration Building 2.224, by phone 972-883-2098, or by email at studentaccess@utdallas.edu.

Server Unavailability or Other Technical Difficulties

The University is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and also contact the online [eLearning Help Desk](#). The instructor and the eLearning Help Desk will work with the student to resolve any issues at the earliest possible time.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please review the catalog sections regarding the [credit/no credit](#) or [pass/fail](#) grading option and withdrawal from class.

Please go to [UT Dallas Syllabus Policies](#) webpage for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.