NSC 4352.001—Cellular Neuroscience—Spring 2025

Mon & Wed 11:30am-12:45pm, GR 4.428

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 TAs **Minsung Kim** Minsung.Kim@utdallas.edu Student Visiting Hours – TBD

Isabella Casmedes Isabella.Casmedes@utdallas.edu Student Visiting Hours - TBD

Undergrad TAs Weekly Review Sessions for all TAs will be announced in Teams/eLearning

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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 3361, CHEM 1311 or CHEM 1315, CHEM 1312 or CHEM 1316. Pre- or Co- requisite BIOL 2311

Course Description
This course provides basic foundations in the field of cellular neuroscience, and intellectual tools for understanding recent advances of molecular and cellular events underlying neural signaling, synaptic transmission and plasticity. We will learn basic morphology and functions of neurons and glia, describe cytology of subcellular organelles in neuronal cells, become familiar with electric neuronal models, illustrating as examples the neuromuscular junction, central synapses, synaptic integration and plasticity.

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 the contributions of anatomical, physiological, behavioral, pharmacological, and molecular biological studies to the bases of neuroscience,
♦ Describe the basic morphology and functions of neurons and glia,
♦ Use proper scientific terminology for neurotransmitters, neurotransmitter receptors, and neurotransmitter receptor/effector signaling systems,
♦ Describe the cytology of subcellular organelles in neuronal cells,
♦ Work with models describing electrical activity of neurons, particularly the role of ion channels in maintaining and altering neuronal membrane potential,
♦ Describe mechanisms of synaptic transmission and synaptic plasticity induced by experience,
♦ Describe and analyze neurophysiological recording methods used to assess neuronal activity, and limits of these techniques.

Course Materials
1. Recommended Textbook: *D. Purves et al., (eds) Neuroscience 7th edition (2023) ISBN-10: 0197616240. The 6th or 5th edition is acceptable as well.*
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 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 large teaching team 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 assist with course content, assignments, general questions, and 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.

NSC4352.001 Spring 2025 Cellular Neuroscience Class Schedule

(Subject to change at the discretion of the Professor)

Week	Day	Date	Topic	Chapter	Practice Exams	DUE in class	DUE in eLearning before 11:58pm
1	Mon	1/20	NO CLASS - University Holiday (MLK Day)				
	Wed	1/22	Introduction & structure of neurons	1			A1 due 1/27
2	Mon	1/27	Cell types of the nervous system	1			
	Wed	1/29	Membrane Potential I	2		A2	
3	Mon	2/3	Membrane Potential II	2	Practice Exam 1 in Testing Center (2/4-2/10)		
	Wed	2/5	Membrane Potential III	2		A3	
4	Mon	2/10	Action Potentials I	3			
	Wed	2/12	Action Potentials II	3		A4	
5	Mon	2/17	**EXAM 1** in TESTING CENTER (2/17-2/18)				
	Wed	2/19	Action Potentials vs Passive Properties	2&3			A5 due 2/23
6	Mon	2/24	Passive Membrane Properties I	2	Practice Exam 2 in Testing Center (2/25-3/3)		
	Wed	2/26	Passive Membrane Properties II	2		A6	
7	Mon	3/3	Ion Channels and Transporters I	4			
	Wed	3/5	Ion Channels and Transporters II	4			
8	Mon	3/10	**EXAM 2** in TESTING CENTER (3/10-3/11)				
	Wed	3/12	Synaptic Transmission I (eLearning)	5			A7 due 3/16
9	Mon	3/17	NO CLASS - University Holiday (Spring Break)				
	Wed	3/19					
10	Mon	3/24	Synaptic Transmission II	5	Practice Exam 3 in Testing Center (3/25-3/31)		
	Wed	3/26	Synaptic Transmission III & Quantal Release	5		A7	
11	Mon	3/31	Neurotransmitters and their Receptors I	6			
	Wed	4/2	Neurotransmitters and their Receptors II	6		A8	
12	Mon	4/7	**EXAM 3** in TESTING CENTER (4/7-4/8)				
	Wed	4/9	Molecular Signaling I	7			A9 due 4/13
13	Mon	4/14	Molecular Signaling II	7			
	Wed	4/16	Molecular Signaling III	7	Practice Exam 4 in Testing Center (4/17-4/23)	A10	
14	Mon	4/21	Short-Term Synaptic Plasticity	8			
	Wed	4/23	Long-Term Synaptic Plasticity	8			
15	Mon	4/28	Activity in Neuronal Networks				
	Wed	4/30	**EXAM 4** in TESTING CENTER (4/29-5/1)				
16	Mon	5/5	Review for Final				
	Wed	5/7	**FINAL EXAM** in TESTING CENTER (5/6-5/8)				

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 exams, activities, 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.

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)	85%	90%	95%	100%
Practice Exams	5%	0%	5%	0%
Activities (in-class and homework)*	10%	10%	0%	0%
TOTAL	**100%**	**100%**	**100%**	**100%**

*drop 2 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.

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. You are responsible for understanding and adhering to all student guidelines.

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, true/false, and multiple choice. You will be given 75 minutes at the Testing Center to complete your exam.

PRACTICE EXAMS
Four practice exams will be given the week prior to the actual exam. **All practice exams are held at the UTD Testing Center – Register now at https://ets.utdallas.edu/testing-center/.** You will be given 30 minutes at the Testing Center to complete your practice exam. There are NO make-up practice exams. Practice exams can count toward your final grade in the course, but there are 2 grading schemas where they count for 0%. Plan to take all Practice Exams.

Practice exams are formatted in a similar manner to the actual exam and are used to help you prepare for your exam. **Completing a practice exam in full will earn you up to 3pts in extra credit for the upcoming exam.** Extra credit points earned from completing practice exams DO NOT transfer to other exams. For example, if you take the Exam 1 practice exam, but do not end up taking Exam 1, the extra credit points earned from that practice exam do not transfer to future exams.

ACTIVITY ASSIGNMENTS

Activities take place in-class, with a few also assigned as homework throughout the course. These are designed to prepare you for exams, and help you put into practice the concepts we cover in class.

In-class activities are due at the end of the class session they are assigned for. Activities assigned for homework will have due dates clearly stated in eLearning and will be posted at least one week in advance of the due date. There are NO make-up activity assignments. I drop your 2 lowest homework grades automatically. Additionally, there are 2 grading schemas where activity assignments count as 0% of your final grade. Plan to complete all activity assignments as they are designed to help you understand and apply the material from this course.

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 success, 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