

BIOL/PSYC 4421-001: Advanced Topics in Neuroscience

Fall 2021

Instructor Information

Instructor:

Qing Lin, MD, PhD

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Room 434, Engineering Research Building (ERB)

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Faculty Profile:

<https://mentis.uta.edu/explore/profile/qing-lin>

Office Hours:

An in-person Office Hour is available every Tuesday between 9 -10 AM in my office (ERB room 434). Facial coverings are highly recommended while visiting the office. Students are welcome to bring questions and interact with the Instructor for Q&A regarding the course learning.

If student requests a virtual meeting with me in “Microsoft Teams”, please make an appointment.

Teaching Assistant for lab session:

Zhen Wang (zhen.wang89@mavs.uta.edu); Office: ERB 442)

Course Information and Schedule

Times and Places of Lecture and Lab Session Meetings:

This is an on-campus (“face-to-face”) class (For a full definition of the course modalities, please go to www.uta.edu/academics/courses-and-schedules).

a. All lectures are held at **12:30 – 1:50 PM** in **LS428** every Tuesday and Thursday.

b. All lab sessions are held at **2:00 – 3:50 PM** in **LS318** every Wednesday.

c. Please note: The first lab session is held on August 25 (Wednesday).

Please also see details in “**Schedules of tentative lectures, Exams, and Lab Sessions**” on pages 2-3.

Please follow the “**Face Covering Policy**” while in the classroom.

Description of Course Content and Learning Outcomes:

This course will cover advanced topics in neuroscience using an integrative and participatory format that includes a lecture portion and a laboratory section. The course is favorable for individuals who have a general background in neuroscience (BIOL/PSYC 3322) and/or neuropharmacology (BIOL/PSYC 4309) and will focus on specific content that is especially relevant to gain a deeper understanding of how the nervous system works and what underlying mechanisms control behaviors. The lecture portion will be combined with a lab discussion, which will provide a forum to discuss neuroscience research-related issues. Students are expected to develop a deeper understanding of the nature of neurobiology and learn how neuroscience is linked to clinical uses. Completion of the course is essential for students who are interested in pursuing a career in neurobiology research or clinical practice of neurological and neurosurgical sciences.

Required Textbooks and Other Course Materials:

Textbook: Purves D. et al. Neuroscience, 6th Edition. Sinauer, Oxford University Press, 2018. ISBN 978-1-60535-380-7. It is **highly recommended** that you have this textbook because you will need to read and study from it to get much detailed information in order to pass the course.

The sets of PowerPoint slides covering lecture outlines are uploaded at “Modules” in the Canvas every Tuesday and Thursday available for students to download.

Reading and writing assignments for lab session are managed by the Teaching Assistant.

Technology Requirements:

Since all information and course materials are provided via the Canvas, it is strongly suggested that students access the Canvas Help and/or tutorials to familiarize and download these tools prior to the class.

Other Requirements:

The course prerequisites of this class are BIOL/PSYC 4309 and/or BIOL/PSYC 3322.

Descriptions of Lecture and Exam Schedule and Lab Assignments:

This is an advanced course that covers almost all aspects of neuroscience. Students are required to know much detailed information. To this end, please be sure to read the textbook and lecture slides before and after attending lectures. Critically, students are strongly suggested to do an intensive review by focusing on those “**Critical contents**” indicated on the last page of PowerPoint slides for each chapter.

There will be *three* closed-book exams, and each exam covers 5-6 chapters. The 3rd exam will NOT be comprehensive. The format for exams will be short-answer questions.

As the instructor for this course, I reserve the right to adjust lecture schedule and lab assignments in any way that serves the educational needs of the students enrolled in this course.

A. Schedules of tentative lectures, exams and lab sessions

WK	Date (Lecture)	Lecture Topics (Every Tuesday and Thursday) LS428	Lab LS318 (Date)	Lab discussion & presentation	Lab assignment due
1	8/26	Neural Signaling: (Ch 2,3) Voltage-dependent membrane permeability	8/25	Introductory Lab	
2	8/31, 9/2	Neural Signaling: (Ch 3,4) Voltage-dependent membrane permeability Channels and transporters	9/1	Lab 1	8/31 (Tue) before 11:59p
3	9/7, 9	Neural Signaling: (Ch 5,6) Synaptic transmission Neurotransmitters and their receptors	9/8	Lab 2	9/6 (Mon) before 11:59p
4	9/14, 16	Neural Signaling: (Ch 6,7) Neurotransmitters and their receptors	9/15	Lab 3	9/13 (Mon) before 11:59p
5	9/21, 23	Neural Signaling: (Ch 7,8) Molecular signaling within neurons Synaptic plasticity	9/22	Lab 4	9/20 (Mon) before 11:59p
6	9/28 9/30	Exam 1 (9/28, Tuesday, 12:30-1:50 PM in LS428) covers chapters 2-7 Neural Signaling: (Ch 8) Synaptic plasticity	9/29	Lab 5	9/27 (Mon) before 11:59p
7	10/5, 7	Sensation/Sensory Processing: (Ch 9) Somatic sensory system	10/6	Lab 6	10/4 (Mon) before 11:59p
8	10/12, 14	Sensation/Sensory Processing: (Ch 10) Pain Sensation/Sensory Processing: (Ch 11) Vision	10/13	Lab 7	10/11 (Mon) before 11:59p

9	10/19, 21	Sensation/Sensory Processing: (Ch 11) Vision	10/20	Lab 8	10/18 (Mon) before 11:59p
10	10/26, 28	Sensation/Sensory Processing: (Ch 12) Vision pathways Movement/Its Central Control: (Ch 16) Lower motor neurons circuits and motor control	10/27	Lab 9	10/25 (Mon) Before 11:59p
11	11/2 11/4	Exam 2 (11/2, Tuesday, 12:30-1:50 PM in LS428) covers chapters 8-12. Movement/Its Central Control: (Ch 16,17) Lower motor neurons circuits and motor control Upper motor neurons control of the brainstem and spinal cord	11/3	Lab 10	11/1 (Mon) before 11:59p
12	11/9, 11	Movement/Its Central Control: (Ch 17, 18) Upper motor neurons control of the brainstem and spinal cord Modulation of movement by the basal ganglia	11/10	Lab 11	11/8 (Mon) before 11:59p
13	11/18	Movement/Its Central Control: (Ch 18,19) Modulation of movement by the basal ganglia Modulation of movement by the cerebellum	11/17	No lab	
14	11/23	The visceral motor system (Ch 21)	11/24	No lab	
15	11/30, 12/2	The visceral motor system (Ch 21)	12/1	Lab 12	11/29 (Mon) before 11:59p
16	12/3-8	Review and Makeup exam (Dec 7, Tue)			
17	12/9-15 Final exam week	Exam 3 (12/14, Tuesday, 11:00 AM-1:30 PM in LS428) covers chapters 16-19 and 21. Please check any updates of "UTA final exam schedule of Fall 2021" at www.uta.edu/records/calendars/final-exams.php			

B. Lab sessions

a. Weekly papers

A research article or material is provided to everyone via Canvas. A paper should be generated based on the readings, which should include the following portions:

1) The first part will be a 1–2-page summary of the article set for that week. For a research article, your summary should include (a) a description of the theoretical background and the applied setting of the research; (b) summary of methods; (c) major findings of each individual experiment; (d) you will also demonstrate your own creativity and insights summarize the “take-home message” from the article as a whole, and (e) offer some suggestions for future, related research. A more specific rubric will be provided in lab.

2) The second part of each paper will be a list of 3-4 substantive questions from the reading for that week. “Substantive” means that your question indicates a mature thoughtfulness and a critical examination of the paper. It also means that you must attempt to offer up some kind of a response to your own question, based on your individual efforts to discover the answer. Please submit your questions on the last page of your summary and also bring them to the lab for further discussion.

Please note:

1) Weekly papers are individual (not group) projects. Please work alone, and do not plagiarize from other people or readings.

2) These will be due by **11:59 PM** on **MONDAY** of each week (Note: The first paper may be due on **TUESDAY**, August 31, 2021). Papers must be uploaded via Canvas.

3) Papers including content of the questions will be discussed in the lab session on Wednesday of each week.

b. Lab presentation

Everyone enrolled in this course is required to give one *30-minute* presentation using PowerPoint slides to the lab on the topic of the article assigned in that week.

c. Lab participation

Lab participation is required for everyone in this course (please refer to “**Grading information**”).

Grading Information

Grading policies:

1. Exams for Lectures (total **300** points): Each exam is worth 100 points. Additional 10 points as bonus are added to each exam. You are required to take all three exams.

2. Assessments for Weekly Papers, Lab Presentation and Lab Participation (total **155** points):

i. Weekly papers (96 points)

Twelve of these papers are required, corresponding to each of the 12 research articles. Papers will be worth 8 points each, for a total of 96 points.

ii. Lab presentation using PowerPoint (20 points)

Presentation will be judged by five criteria: Slide preparation (4 points), Clarity (4 points), Critiques (4 points), Presentation (4 points), and Understanding (4 points) for a total of 20 points.

iii. Lab participation (39 points)

Lab participation points: Earn 3 points per session (13 Lab participations) by speaking in the lab, including (but not limited to) asking questions based on articles that are assigned to read, respectfully responding to another member of the class, raising a relevant issue for discussion, etc. Remaining silent earns zero points. 39 points are for 13 lab sessions (3 points x 13).

Grade calculation:

The final course grade will be determined by dividing the total number of earned points (including earned bonus points) on your exams, papers, presentation and participation by the total number of points (**455**). For example, if you earn 390 points, your final grade will be $390/455 \times 100 = 85.7\%$.

Three exams:	300 (100 each)
Papers:	96
Lab presentation:	20
Lab participation:	39
<u>Total:</u>	455

Grades will be determined as follows:

A ≥ 90%, B ≥ 80%, C ≥ 70%, D ≥ 60%, F < 60%.

Please note: There will be **no** extra credit work to make up the grade. Please do not ask.

Make-up Exams:

If you miss an exam, a grade of zero will be given. There is no provision for taking a makeup exam in this course *unless* documentation for a University-approved excuse (see <http://www.uta.edu/catalog/general/academicreg>) is received within five days of the exam date.

Please note: The instructor will schedule the dates/times and places for taking makeup tests and then informs the students involved.

Expectations for Out-of-Class Study

Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 12 hours per week of their own time in course-related activities, including reading required materials for the lab session, completing assignments, preparing for exams, etc.

Institution Information

UTA students are encouraged to review the below institutional policies and informational sections and reach out to the specific office with any questions. To view this institutional information, please visit the [Institutional Information](https://resources.uta.edu/provost/course-related-info/institutional-policies.php) page (<https://resources.uta.edu/provost/course-related-info/institutional-policies.php>) which includes the following policies among others:

- Drop Policy
- Disability Accommodations
- Title IX Policy
- Academic Integrity
- Student Feedback Survey
- Final Exam Schedule

Additional Information

Face Covering Policy:

While the use of face coverings on campus is no longer mandatory, all students and instructional staff are strongly encouraged to wear face coverings while they are on campus. This is particularly true inside buildings and within classrooms and labs where social distancing is not possible due to limited space. If a student needs accommodations to ensure social distancing in the classroom due to being at high risk they are encouraged to work directly with the Student Access and Resource Center to assist in these accommodations. If students need masks, they may obtain them at the Central Library, the E.H. Hereford University Center's front desk or in their department.

Attendance:

At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator of student success. Each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients "begin attendance in a course." UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report must the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Canvas. This date is reported to the Department of Education for federal financial aid recipients.

Please note: As the instructor of this course, I have established the attendance policy as below:
1) For the lecture session in LS428, I will not necessarily track and record class attendance. However, due to much information included in the course, routinely attending the lecture will be

extremely beneficial to students in grabbing and understanding the materials to improve the performance of course learning. **2)** Lab attendance and participation in LS318 are required in this course (please refer to “**Grading policies**”). The absence may be excused due to the events that happen unpredictably, such as illness (documentation is needed).

Emergency Exit Procedures:

Should we experience an emergency event that requires evacuation of the building, students should exit the room and move toward the nearest exit (there are three entrance doors in the LS building available for evacuation). When exiting the building during an emergency, do not take an elevator but use the stairwells instead. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Academic Success Center:

The Academic Success Center (ASC) includes a variety of resources and services to help you maximize your learning and succeed as a student at the University of Texas at Arlington. ASC services include supplemental instruction, peer-led team learning, tutoring, mentoring and TRIO SSS. Academic Success Center services are provided at no additional cost to UTA students. For additional information visit: [Academic Success Center](#). To request disability accommodations for tutoring, please complete this [form](#).

The IDEAS Center (<https://www.uta.edu/ideas/>) (2nd Floor of Central Library) offers **FREE** tutoring and mentoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. Students can drop in or check the schedule of available peer tutors at www.uta.edu/IDEAS, or call (817) 272-6593.

The English Writing Center (411LIBR):

The Writing Center offers **FREE** tutoring in 15-, 30-, 45-, and 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Register and make appointments online at the Writing Center (<https://uta.mywconline.com>). Classroom visits, workshops, and specialized services for graduate students and faculty are also available. Please see Writing Center: OWL for detailed information on all our programs and services.

The Library’s 2nd floor Academic Plaza (<http://library.uta.edu/academic-plaza>) offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library’s hours of operation.

Librarian to Contact:

Each academic unit has access to Librarians by Academic Subject that can assist students with research projects, tutorials on plagiarism and citation references as well as support with databases and course reserves.

Emergency Phone Numbers

In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911. Non-emergency number 817-272-3381

Library Information

Research or General Library Help

Ask for Help

- [Academic Plaza Consultation Services](http://library.uta.edu/academic-plaza) (library.uta.edu/academic-plaza)
- [Ask Us](http://ask.uta.edu/) (ask.uta.edu/)
- [Research Coaches](http://libguides.uta.edu/researchcoach) (http://libguides.uta.edu/researchcoach)

Resources

- [Library Tutorials](http://library.uta.edu/how-to) (library.uta.edu/how-to)
- [Subject and Course Research Guides](http://libguides.uta.edu) (libguides.uta.edu)
- [Librarians by Subject](http://library.uta.edu/subject-librarians) (library.uta.edu/subject-librarians)
- [A to Z List of Library Databases](http://libguides.uta.edu/az.php) (libguides.uta.edu/az.php)
- [Course Reserves](https://uta.summon.serialssolutions.com/#!/course_reserves) (https://uta.summon.serialssolutions.com/#!/course_reserves)
- [Study Room Reservations](http://openroom.uta.edu/) (openroom.uta.edu/)