Cellular Neuroscience, NSC 4352.HN1

Course and Contact Information

Instructor: Eva LaDow
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Office location and phone: GC 2.216A, 972-883-3526
Class Time & Location: Mondays and Wednesdays 10-11:15am, GC 1.208B
Office Hours: Thursdays 2-3pm, Fridays 11am-12pm, and by appointment.

Course Descripton

The purpose of the course is to supply the basic notions in the field of cellular neuroscience, and the intellectual tools for understanding recent advances in cellular neurobiology. Neurons are highly specialized cells, with distinctive architecture, organization, and electrical properties. In this course, we will explore the cell biology of the nervous system, with an emphasis on the fundamental signaling properties of neurons.

Learning Objectives

Students will identify and describe basic morphology and functions of neurons and glia, the cytology of subcellular organelles in neurons, electric neuronal models, the neuromuscular junction, central synapses, intracellular signaling mechanisms, and synaptic plasticity. Students will also identify important experimental techniques in cellular neuroscience and analyze relevant experimental data.

Required Textbooks and Materials

The required textbooks for this course will be:

1) Neuroscience, 5th Edition by Dale Purves et al.
2) Principles of Neural Science, 5th Ed . by Eric Kandel et al.

Additional reading may be assigned throughout the course at the instructor's discretion. These distributed in class or electronically. If you are unable to attend class, you are responsible for contacting me to let me know.

Assignments and Academic Calendar

Please note homework assignments for the course are numbered H1, H2, and so on. They will be distributed on Wednesdays and will be due at the beginning of class the following Monday. Answer keys will be distributed at the end of class on Mondays. Review questions are for your use and will not be turned in or graded.

Date	Agenda	Reading	Assignments
24-Aug	Introduction		
26-Aug	Neuronal cytology I: organelles	Purves Ch.1, Kandel Ch. 2, 4	
31-Aug	Neurons and glia	Purves Ch.1, Kandel Ch.2	Hand out H1
3-Sep	Membrane potential I	Purves Ch.2, Kandel Ch.5, 6	H1 DUE
7-Sep	**LABOR DAY**		
9-Sep	Membrane potential II	Purves Ch.2, Kandel Ch.5, 6	
14-Sep	Action Potential I	Purves Ch.3, Kandel Ch.7	
16-Sep	Action Potential II, Pumps & Transporters	Purves Ch.3, Kandel Ch.7	Review Q's Handed out
21-Sep	**In class review**		
23-Sep	**Exam I**		
28-Sep	Properties of Ion Channels	Purves Ch.2, Kandel Ch.5, 6	
30-Sep	Channelopathies	Purves Ch.2, Kandel Ch.5, 6	Hand out H2
5-Oct	Synaptic transmission: electrical & chemical	Purves Ch. 5, Kandel Ch.8	H2 DUE
7-Oct	Vesicular neurotransmitter release	Purves Ch. 5, Kandel Ch.12	Hand out H3
12-Oct	The neuromuscular junction	Purves Ch.5,6, Kandel Ch. 9	H3 DUE
14-Oct	Synaptic Integration	Kandel Ch. 10	Review Qs for Exam II
19-Oct	**In class review**		

21-Oct	**Exam II**		
26-Oct	Neurotransmitters I	Purves Ch. 6, Kandel Ch. 13	
28-Oct	Neurotransmitters II	Purves Ch. 6, Kandel Ch. 13	Hand out H4
2-Nov	Receptors and intracellular signaling	Purves Ch. 7, Kandel Ch.11	H4 DUE
4-Nov	Intracellular Signaling II	Purves Ch. 7, Kandel Ch.11	Hand out H5
9-Nov	Synaptic Plasticity I	Purves Ch. 8, Kandel ch.55, 56	H5 Due
11-Nov	Synaptic Plasticity II	Purves Ch. 8, Kandel 56, 57	Hand out Review Qs, Primary Research Article
16-Nov	Synaptic Plasticity III	Purves Ch. 8, Kandel 56, 57	
18-Nov	**Exam III**		
23-Nov	**FALL BREAK**		
25-Nov	**FALL BREAK**		
30-Nov	Post translational modifications	Kandel Ch.4, TBA	Optional draft due
2-Dec	Protein trafficking & RNA trafficking	Kandel Ch.4, TBA	
7-Dec	From neurites to nucleus	Purves Ch. 7, Kandel Ch.3, TBA	
9-Dec	Class discussion of primary article, **In Class Review**	Primary research article (TBA)	Summary of article due, Hand out Review Q's
TBA	**CUMULATIVE FINAL EXAM**		

Grading Policies

Your grade for the course will be based on homework completion, exams, and a short writing assignment.
The grading scale for letters from percentages will be as follows: A+: 97-100%, A: 93-96%, A-: 90-92%, B+:87-89%, B: 83-86%, B-: 80-82%, C+: 77-79%, C:73-76%, C-: 70-72%, D: 60-69%.
The contribution of each assignment/exam toward the final grade is as follows: Attendance and participation- 5%, Homework and article summary- 15%; Exam I- 15%, Exam II- 20%, Exam III- 20%, Final Exam- 25%.

Homework: Each homework assignment will be a short (1-2 pg) handout with problems or questions related to the previous weeks' material. Grades will be based on completeness and effort *, not correctness*. In other words, full credit will be given for an honest effort even if the answers are not correct. Note: Longer review question sets will be handed out before exams, but these will not be turned in or graded. They are for study purposes only.

Exams: In-class exams will be cumulative in nature, but focused on the most recent material. The cumulative final will draw on the material from Exams I, II, and III equally.

Attendance and Class Participation: I expect students to come to class on time, having read the material and ready to contribute to the group discussion. Bring the appropriate course reading and notes with you to class. Be respectful of your classmates. **Use of cell phones and laptops is prohibited during class.** Exceptions may be made for e-readers used for class material. Class is short; cell phones and social media are distracting.

Nota bene: There will be no extra credit and late work will be accepted only in documented emergency situations and at the discretion of the professor.

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 go to http://go.utdallas.edu/syllabus-policies for these policies.

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