Neurophysiology
Fall 2017

This course syllabus is intended as a set of guidelines for Neurophysiology Course. Both UT Dallas and your instructor reserve the right to make modifications in content, schedule, and requirements as necessary to promote the best education possible within prevailing conditions affecting this course.

Course Number/Section: **NSC 4356-001 (81191)**
Course Title: Neurophysiology
Classroom: CR 1.202
***Term: Fall* 2017**
***Days & Times:* Tuesday & Thursday 4:00 PM- :5:15PM**

Professor Contact Information:
***Professor*:** *Rukhsana Sultana*, PhD
Email Address rukhsana.sultana@utdallas.edu
Office Location: TBA
Office Hours: Tuesday and Thursday from 2:00PM- 3:30PM or email for appointment.

Teaching Assistants:
Dema Abdelkarim: Dema.Abdelkarim@utdallas.edu
Teaching Assistant Office Hours: email for appointment.
Review sessions: to be determined.

Final Exam: 12/05/2017: 8:00-10:45 am

Course Pre-requisites
Prerequisites: NSC 4352 Cellular Neuroscience

Course Description
The proper function of the nervous system is based on bioelectricity. Electrical activity and conduction in neurons is determined to a great extent by neuronal membrane properties. This Neurophysiology course is a survey of the active and passive biophysical properties that contribute to membrane potentials and conductances in neurons. It is aimed to supply the necessary information to understand how single neurons respond to electrical and chemical stimuli and how they conduct electrical signals.

Student Learning Objectives/Outcomes
After completing the course, students should be able to:

1.1 Describe the properties of ions in solution and lipid membranes that contribute to the establishment of ion separation and gradients across neuronal membranes.
1.2 Describe the properties of neurons in terms of components of electrical circuits
1.3 List the passive properties of membranes that contribute to electrical conduction.
1.4 Explain the origin of the resting membrane potential.
1.5 List the ionic conductances that contribute to the action potential including how the kinetics of these conductances are ideally suited to generate the action potential
1.6 Describe the major features of voltage-gated and ligand-gated ion channels including differences between the two families
1.7 Explain how electrical activity in neurons can be studied using currently available research methods.

1.8 Demonstrate mastery of how neurons function and signal, be able to critically evaluate data presented and draw conclusions from those data, and understand how basic properties of neurons can be manipulated for research and how understanding these properties can lead to development of new therapeutics.

Required Textbooks and Materials

1) Bertil Hille: Ion Channels of Excitable Membranes, Third edition, Sinauer, 2001

2) Lecture PPT files will be posted on eLearning before each lecture. There is no guaranteed posting date or time but files will be posted at least 1 hour before lecture. Slides are for your own use to aid your learning in this course. Reposting of these slides online or reuse of these slides for other purposes is prohibited.

Course Policies & Requirements

The concepts covered in this course can be technically challenging. Reading the textbook prior to lecture is highly recommended to understand the concepts and to complete the course successfully. You are required to attend every class.

Photography and videography is prohibited. Audio recording is allowed (but prior permission is required).

Grade Changes:

Following exams you will have one week, after which no changes will be made to any grade. There is no opportunity for extra credit in this course.

Exams:

There will be 4 comprehensive exams. These exams cannot be dropped. These will be multiple choice. Excused absences for exams require both appropriate documentation and **advance notice** (by email, phone, or in person).

End of semester Assignment: Show what you learned in this class by submitting 2-3 pages describing the neurophysiological changes that lead to the pathogenesis of one of the following disease (s): Alzheimers disease, Shizophrenia, Autism, epilepsy, Attention Deficit Hyperactivity Disease (ADHD).

Unannounced Quizzes

Quizzes will be given on the topics already covered depending on the class need. Please come prepared**. No make up for the missed quizzes for an unexcused absence.**

Attendance: All students are expected to attend each class. Only official UT Dallas events or documented medical emergencies will be excused.

Grading Policy and Final Grade Scale

(NOTE: There is NO extra credit possible in this class)

- 4 exams, multiple choice: 70% of your grade
- Unannounced quizzes: 10% of your grade
- End of semester Assignment: 20% of your grade

GRADING SCALE:

Percent Grade Point Range Totals
90.0-100% A
78.0-89.99% B
65.0-77.99% C
55.0-64.99% D
54.99% and less F

Course Outline

TENTATIVE LECTURE SCHEDULE FOR SPRING 2017

MONTH	Date	Topic	Exams/Assignments
August	22	Introduction	
	24	Ions and Membranes	
	29	Physics Review	
	31	Physics Review	
September	5	Hille Chapter 1	
	7	Hille Chapter 1	
	12		**EXAM I**
	14	Hille Chapter 2	
	19	Hille Chapter 2	
	21	Hille Chapter 3	
	26	Hille Chapter 3	
	28	Hille Chapter 4	
October	3	Hille Chapter 4	
	5		**EXAM II**
	10	Hille Chapter 5	
	12	Hille Chapter 5	
	17	Hille Chapter 5	
	19	Hille Chapter 6	
	24	Hille Chapter 6	
	26	Hille Chapter 6	
	31		**EXAM III**
November	2	Hille Chapter 8	
	7	Hille Chapter 8	
	9	Hille Chapter 8	
	14	Methods	
	16	Methods	
	21	No class (Fall Break)	
	23	No class (Fall Break/Thanksgiving)	
	28	Methods	
	30	Review	**Due date to submit the end of semester assignment**
December	**5**	**Final Exam**	**EXAM IV**

Notes:

- This schedule is subject to change with adequate notice given to students.
- All exams are closed book exams.
- Exam grades will be posted in elearning/blackboard.
- Check elearning/Blackboard for announcements regarding any change in lecture schedule

- Students are responsible for the textbook material. Not all textbook material will be covered in lectures. Students MUST read the textbook and are responsible for the textbook material unless otherwise notified by the instructor.

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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.