



Neurophysiology Fall 2015

Course Number/Section: NSC 4356-001

Course Title: Neurophysiology

Classroom: GR 4.428

Term: Fall 2015

Dates: Aug 25th – Dec 8th

Days & Times: Tuesday & Thursday 1:00- 2:15

Professor Contact Information:

Professor: Greg Dussor, PhD

Email Address gregory.dussor1@utdallas.edu

Office Location: JO 4.208

Office Hours: One hour after each Tuesday lecture, or email for appointment.

Teaching Assistants:

Christopher de Solis (Graduate) cad130330@utdallas.edu

Nikita Tangella (Undergraduate) nxt120430@utdallas.edu

Teaching Assistant Office Hours: email for appointment.

Review sessions: to be determined.

Final Exam: 12/17/2015 2:00-4:45 pm

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.



Required Textbooks and Materials

- 1) Bertil Hille: Ion Channels of Excitable Membranes, Third or later edition, Sinauer, 2001
- 2) A clicker will be required every day.
- 3) 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.

The pace of the course and material covered will, in part, be based upon results from assessments made during each lecture (using clicker questions). You are required to attend every class.

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 3 comprehensive exams. These exams cannot be dropped. These will be multiple choice and will not use the clicker. Excused absences are for exams only and require both appropriate documentation and advance notice (by email).

Attendance: All students are expected to attend each class. Clicker questions during class are used to evaluate progress and help pace the course. Only official UT Dallas events or documented medical emergencies will be excused. No credit will be given to students who forget the clicker. Do not email the Professor or the Teaching Assistants requesting credit for a forgotten clicker. Clicker points will be posted regularly (at least once/week) and it is the student's responsibility to ensure that points are being recorded for clicker use.

Grading Policy and Final Grade Scale

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

Exam 1:	(30% of your grade)
Exam 2:	(30% of your grade)
Final: Dec 17 @ 2pm	(30% of your grade)
Clicker Questions:	(10% of your grade)

10% of your grade will be based on participation in clicker questions throughout the semester. Assignment of your grade in this section is left to the discretion of the course director. Assignment of your grade in this section will be based on the following breakdown:

<u>Attendance %</u>	<u>Grade</u>
80-100	100
50-80	80
25-50	50
1-25	25
0	0



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

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.

Acknowledgements go to Dr. Robert Rennaker for developing prior iterations of this course and for assembling much of the course material.