



# Neurophysiology Spring 2010

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*Course Number/Section:* NSC 4356-001  
*Course Title:* Neurophysiology  
*Classroom:* GR 4.428  
*Term:* Spring 2010  
*Days & Times:* Tuesday & Thursday 8:00- 9:15

## **Professor Contact Information:**

*Professor:* Dr. Robert L Rennaker II  
*Email Address* <mailto:renn@utdallas.edu>  
*Office Location* GR 4.428  
*Office Hours:* 1 hour following class, or email for appointment

## **Course Pre-requisites, Co-requisites, and/or Other Restrictions**

**Prerequisites:** NSC 3361 Behavioral Neuroscience and NSC 4353 Lab Methods

## **Course Description**

The central nervous system is a complex array of neuronal cells connected in a highly ordered array. Its functional properties are determined to a great extent by the membrane properties of neurons, and by the manner in which they communicate and connect with each other. The Neurophysiology course is a survey of the biophysical properties of membrane conductances in neuronal and sensory cells, aimed to supply the basic information to understand how single neurons respond to electrical and chemical stimuli.



## **Student Learning Objectives/Outcomes**

After completing the course, students should be able to:

- 1.1 Describe the historical development of neuroscience as a cross-disciplinary science.
- 1.2 Describe and analyze the contributions of anatomical, physiological, behavioral, pharmacological, developmental, and cell and molecular biological studies to the bases of neuroscience
- 1.3 Use proper terminology for neurotransmitters, receptors, and receptor/effector signalling systems, network properties and functional organization
- 1.4 Identify major structural and functional areas of the nervous system
- 1.4 Work with models describing electrical activity of neurons, particularly the role of ion channels in transmitting information within a cell and to other cells.
- 1.5 Describe assumptions and limitations of current methods
- 1.6 Describe why multiple research techniques and multiple levels of analysis are necessary to understand neural function

## **Required Textbooks and Materials**

- 1) Bertil Hille: Ion Channels of Excitable Membranes, Third or later edition, Sinauer, 2001
- 2) Kandel, Schwartz, Jessel: Principles of Neural Science, McGraw-Hill, 4th or later edition
- 3) A clicker

## **Course Policies & Requirements**

This course requires a *significant* amount of reading to complete the course successfully. The pace of the course and material covered will, in part, be based upon results from random assessments.



### **Exams:**

There will be two exams during the semester. The exams will be based upon lecture, reading and quiz materials. Questions about the accuracy of grading on any test or quiz must be addressed within 1 week of obtaining your grade on that test or quiz. No exceptions will be made to this policy.

**These are the only reasons that will be allowed for make-up exams.** Students on **Official University business** should bring me an official notice from your organization of class conflicts so that alternative arrangements can be made **at least one week before the test**. If you are **sick** you must contact me **prior to the test**.

Students with a verified learning **disability** should also bring this documentation to me **by the end of the FIRST Week** of class so that we can discuss testing arrangements for the exams.

Procrastination will only cause you problems with your grades in this class and all deadlines will be fairly and uniformly enforced. I strongly encourage you to set aside a dedicated time that you do your coursework, review this syllabus regularly to ensure that you are on task, and meet your deadlines early for your assignments. Quizzes will be based on reading assignments and information covered in previous class sessions. **For you to succeed in this class, you will need to be an active and intellectually engaged participant.**

**Attendance:** All students are expected to attend each class. Quizzes during class are used to help you evaluate your progress and help me pace the course. Material from the quizzes will be on tests in one form or another.

### **Grading Policy and Final Grade Scale: (NOTE: There is NO extra credit)**

EXAM 1- Midterm: (35% of your grade)

EXAM 2- Final: (35% of your grade)

Quizzes: (30% of your grade) You can drop your 3 lowest quiz scores.

### **GRADING SCALE:**

#### **Percent Grade Point Range Totals**

95-100% A+

90-94.9999% A

80-89.9999% B

70-79.9999% C

60-69.9999% D

59.99999% and less F



**Graduate Students:** Graduate students will be required to write a review on a topic related to the course. This paper must be original to this class and all supporting material must come from peer reviewed journals, Not the INTERNET!!!  
**The grade on the paper will be in lieu of the quiz grades.**

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### **Student Conduct & Discipline**

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year. The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972-883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

### **Academic Integrity**

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrates a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.



### **Withdrawals from Class**

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

### **Student Grievance Procedures**

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*. In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

### **Incomplete Grade Policy**

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been COMPLETED SUCCESSFULLY. You must get the permission of the instructor and make arrangements for incomplete work prior to this grade being assigned. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester.

### **Disability Services**

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m. The contact information for the Office of Disability Services is:

The University of Texas at Dallas, SU 22

PO Box 830688

Richardson, Texas 75083-0688

(972) 883-2098 (voice or TTY)



Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance. It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

### **Religious Holy Days**

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated. The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding a religious absence and in advance of the assignment. All religious holidays that will be observed should be submitted in writing to the instructor at the beginning of the semester. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment. If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.