Department of Biological and Environmental Sciences
BSC 425.01E FUNDAMENTALS OF NEUROSCIENCE (CRN: 22524)
COURSE SYLLABUS: SPRING 2014

Instructor: Izhar A. Khan, Ph.D.
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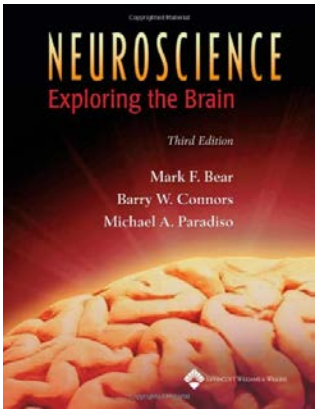
COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Textbook(s) Required: Bear, Mark F., Connors, Barry W. and Paradiso, Michael A. *Neuroscience: Exploring the Brain; Third Edition*. Baltimore: Lippincott, Williams and Wilkins, 2007. ISBN-13: 978-0-7817-3944-3
Optional: None.



Course Description

This course is designed for students with a thorough background in biology and cell biology. Therefore, this course provides students with a greater understanding of molecular, developmental, and network mechanisms of neuronal function. Emphasis will be placed on molecular and cellular components of neurons and other nervous system cell types at their most basic level. In addition, unique specific systems, particularly sensory and movement systems as well as the topics of cognitive development and aging will be explored. Students are expected to gain an in-depth understanding of basic principles and concepts of neurons at the molecular levels, learn to reason scientifically, and to understand and describe the cooperative function of organelles in specialized neuronal cells.

Student Learning Outcomes
Upon successful completion of this course, students will be expected to:

1. Describe unique and common characteristics of unifying concepts of neurons including:
   - Cellular components of neurons
   - Functional Role of Glia
   - Membrane Potential, Action Potentials and Neurotransmitters
   - Receptors and Postsynaptic Integration
2. Understand Sensory Motor Systems, particularly:
   - Chemical Senses
   - The Eye
   - The Somatic Motor System
3. Apply principles of neuroscience to demonstrate an understanding of the brain and behavior, particularly:
   - Sex and the Brain
   - Brain Mechanisms of Emotion
   - Mental Illness
4. Describe the concepts of Complex Neural Processes including:
   - Wiring the Brain
   - Molecular Mechanisms of Learning and Memory
5. Be able to use the language of biology to write a clear and concise paper including an Abstract, Introduction, Materials and Methods, Results including figures and figure legends and Discussion of a primary journal article. Articles will be selected by the students with the help of the instructor if necessary.

COURSE REQUIREMENTS

Instructional Methods/Activities/Assessments
This course consists of a series of activities and assessments to assist you in achieving the outcomes for all instructional units in the course.

Formal lectures will be supplemented with appropriate audiovisual materials, at home problems, and discussions. PowerPoint of all lectures will be available for you in the Doc Sharing portion of eCollege. I strongly encourage you to print these slides (4 or 6 slides per page) so you can take notes pertaining to the relevant slides in class. Alternatively lap top computers can be used during the lecture. I will post announcements on the home page of the course for reminders of important due dates. Progress in the class can be monitored using the Gradebook.

Your entire course grade is based on your performance on various assignments, quizzes and exams. Some of these activities will require you to answer a set of multiple choice/short answer questions, whereas other assignments will require you to write short essays and prepare in-depth presentations using Microsoft PowerPoint or similar presentation software.

Writing Assignment
The assignment is to write a synopsis of a paper chosen by the student. The topic must have something to do with biology/physiology/neuroscience. Papers must be submitted by the end of week 8 (Before Spring Break). Keep in mind the sooner the paper is done the more opportunities are available to improve the grade as I will allow re-writes to facilitate the learning process. The

paper should be edited multiple times, hopefully by multiple readers, including your peers. I would like to discuss my comments on papers, preferably in person. The goal of this exercise is to demonstrate an understanding of the selected paper. The paper will be worth 50 points of an exam grade. To earn all of your points you must be well organized and meet the deadlines. Please include an abstract, introduction, materials and methods, results including figures and figure legends and discussion (of your own writing). Papers can be submitted using the Week 8 Dropbox in eCollege. Opportunities will be available to improve your grade after the Spring Break.

It is important for the students to understand the format in which papers are written in terms of setting up hypothesis driven research, the background information on why the research was done, what were new and interesting findings and the significance or relevance of those findings to the current literature or in advancing science. This exercise is also useful for the students to better understand research methodology, especially for those with limited or no prior exposure to laboratory research and practices.

Presentation of a research paper is available for extra credit (see below). Each student will pick a week and topic for his/her presentation.

Resources

There are a variety of resources at your disposal to aid with your studies. This lecture course will be "Web Enhanced." The course has an *eCollege* site that you will be expected to use regularly. You may enter the site via your *my*Leo account, or go directly to http://online.tamuc.org.

The Academic Calendar includes information regarding University holidays, deadlines to add, drop, withdraw, and other such activities. This page also includes the link to the Final Exam schedule for each semester: http://web.tamuc.edu/admissions/registrar/academicCalendars/ "

Grading

Three Term Exams – 100 points each = 300 points
Comprehensive Final Exam = 100 points
Quizzes and Assignments = 100 points (Quizzes 50 points and paper writing 50 points)
Paper discussion/presentation = 10 bonus points for extra credit

At the end of the semester, the students' grade will be determined by calculating the percentage of the total possible points received by the student. Percentages are then converted to letter grades using the following rubric:

Percentage of Total Possible Points Received by student	**Letter Grade**
Greater than or equal to 89.5	A
Greater than or equal to 79.5, but less than 89.5	B
Greater than or equal to 69.5, but less than 79.5	C
Greater than or equal to 59.5, but less than 69.5	D
Less than 59.5	F

COURSE AND UNIVERSITY PROCEDURES

Course Specific Procedures

Academic Honesty
Texas A&M University-Commerce does not tolerate **plagiarism** and other forms of academic **dishonesty**. Conduct that violates generally accepted standards of academic honesty is defined as academic dishonesty. "Academic dishonesty" includes, but is not limited to, plagiarism (the appropriation or stealing of the ideas or words of another and passing them off as one's own), cheating on exams or other course assignments, collusion (the unauthorized collaboration with others in preparing course assignments), and abuse (destruction, defacing, or removal) of resource material.

Assignments
Official due dates are for each assignment will be announced through eCollege or directly by email. Assignments must be uploaded to the eCollege Dropbox. The format of the file may vary, depending on the assignment. Please note that for every file you submit, you must have your last name included in the filename as well as in the header.

Late Work
Late work will not be accepted.

Drop a Course
A student may drop a course by logging into their *my*LEO accounts and clicking on the hyperlink labeled 'Drop a class' from among the choices found under the *my*LEO section of the Web page.

Incompletes
Incomplete grade ("I") may be granted under extreme circumstances following the University guidelines.

University Specific Procedures

ADA Statement
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services, Texas A&M University-Commerce
Gee Library, Room 132, Phone (903) 886-5150 or (903) 886-5835, Fax (903) 468-8148
StudentDisabilityServices@tamuc.edu or visit
http://www.tamuc.edu/CampusLife/CampusServices/studentDisabilityResourcesAndServices/default.aspx

Student Conduct
All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See Student's Guide Handbook, Policies and Procedures, Conduct)

Access to Student Work
Copies of your work in this course including copies of any submitted papers and your portfolios may be kept on file for institutional research, assessment and accreditation purposes. All work used for these purposes will be submitted anonymously.

Weather Closings
Snow closings are generally announced on area television and radio stations. Unless otherwise advised by radio announcement or by official bulletins on the number listed above, students are expected to report for class as near normal time as possible on days when weather conditions are adverse. Decisions as to snow closing or delayed opening are not generally made before 5:00 AM of the working day. Students are expected to attend class if the University is not officially closed.

TENTATIVE SCHEDULE*

Week 1: January 13th – 17th	Chapter 2: Neurons and Glia
Week 2: January 20th – 24th	Chapter 3: The Neuronal Membrane at Rest
Week 3: January 27th – 31st	Chapter 4: The Action Potential Quiz 1 – Monday, January 27th (Ch: 2 & 3)
Week 4: February 3rd – 7th	Chapter 5: Synaptic Transmission
Week 5: February 10th – 14th	Chapter 6: Neurotransmitter Systems Exam 1 – Friday, Feb 14th (Ch: 2, 3, 4 & 5)
Week 6: February 17th – 21st	Chapter 7: The Structure of the Nervous System
Week 7: February 24th – 28th	Chapter 17: Sex and the Brain Quiz 2 – Monday, Feb 24th (Ch: 6 & 7)
Week 8: March 3rd – 7th	Chapter 18: Brain Mechanisms of Emotion Writing Assignment due Friday, March 7th
Week 9: March 10th – 14th	Spring Break
Week 10: March 17th – 21st	Chapter 22: Mental Illness Exam 2 – Friday, Mar 21st (Ch: 6, 7, 17 & 18)

Week 11: March 24th – 28th	Chapter 8: The Chemical Senses Quiz 3 – Monday, March 24th (Ch: 17, 18 & 22)
Week 12: March 31st – April 4th	Chapter 9: The Eye
Week 13: April 7th – 11th	Chapter 12: The Somatic Sensory System Exam 3 – Friday, Apr 11th (Ch: 22, 8 & 9)
Week 14: April 14th – 18th	Chapter 23: Wiring the Brain
Week 15: April 21st – 25th	Chapter 25: Molecular Mechanisms of Memory and Learning Quiz 4 – Monday, Apr 21st (Ch: 12 & 23)
Week 16: April 28th – May 2nd	Open (Term exams will push some of the lectures back and the final week may be needed to cover some of the topics). Final Exam Review and Quiz 5 – Friday May 2nd.

Final Exam: Wednesday, May 7, 2014, 8:00-10:00 AM.

The schedule for paper discussions/presentations will be discussed in the class prior to finalizing the dates.

***THE SCHEDULE IS TENTATIVE AND SUBJECT TO CHANGE**