PRINCIPLES OF NEUROSCIENCE III
‘MOLECULAR NEUROPHARMACOLOGY & ITS CLINICAL APPLICATION’

GMS6023 -- SPRING/2016
2 CREDITS

CLASS LOCATION: MBI BUILDING, L1-101

MEETING TIME: MONDAY, WEDNESDAY, FRIDAY (10 AM-12 NOON) EXCEPT

There will be class on Thursday, February 11th from 10 am – noon.

COURSE DIRECTORS: Habibeh Khoshbouei, Pharm.D., Ph.D.
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COURSE DESCRIPTION AND OBJECTIVES:
This course surveys the basic principles of neuropharmacology with an emphasis on the molecular pharmacology of drugs used to treat CNS disorders. The specific focus of this course will be to provide a description of the cellular and molecular actions of drugs on synaptic transmission with in-depth discussion of drug-induced changes in functioning of the nervous system. We will examine how the neurotransmitter systems influence nervous system as well as therapeutic targets affecting these transmitter systems. Issues surrounding drug entry into the central nervous system will be addressed. Clinical applications of neuropharmacology, the link between neuropharmacology and behavior, and current research investigating the development of drugs for neuronal targets will be addressed. This course is designed to provide a foundation for advanced knowledge in behavioral neuroscience and neuro-psychopharmacology, and to provide an introduction to the pharmacological treatment of CNS pathologies. The ultimate goal is to understand how molecular neuroscience can guide the direction of basic medical science and therapeutic approaches.

COURSE TEXTBOOK:
One of the following Textbooks is recommended for this course:

- Molecular Neuropharmacology: A Foundation for Clinical Neuroscience

- The Biochemical Basis of Neuropharmacology, Cooper

Reference books available at the library (on hold)

- Cell Surface Receptors: A Short Course on Theory and Methods

- Psychopharmacology: Drugs, the Brain and Behavior


**PREREQUISITE KNOWLEDGE AND SKILLS:**

*You are expected to be familiar with basic Neuroscience concepts before starting this course series. If you are uncertain about the sufficiency of your background, you are encouraged to read through chapters one through ten in Neuroscience Online – an electronic textbook (Open Access)*

http://neuroscience.uth.tmc.edu/s1/index.htm

### COURSE SCHEDULE:

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<th>Day</th>
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<th>Topic</th>
<th>Lecturer</th>
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| 1   | Feb 8 | Introduction to Neuropharmacology. History of Drug Discovery Past to Present  
Theoretical and practical analysis of Receptor Occupancy and Cellular Response | Dr. Habibeh Khoshbouei          |
| 2   | Feb 10| Principles of Nervous System Physiology & Pharmacology  
Site of Action of Drugs & Signal Transduction Mechanisms | Dr. Eduardo Candelario-Jalil    |
| 3   | Feb 11| Pharmacogenomics                                                      | Dr. Eduardo Candelario-Jalil    |
| 4   | Feb 12| Glutamatergic Neurotransmission – NMDA Receptors                      | Dr. Eduardo Candelario-Jalil    |
| 5   | Feb 15| Glutamatergic Neurotransmission – AMPA, Kainate, and Metabotropic Receptors  
Pathophysiology & Pharmacology of Glutamatergic Neurotransmission | Dr. Eduardo Candelario-Jalil    |
| 6   | Feb 17| GABA & Glycine Neurotransmission  
Pathophysiology & Pharmacology of GABAergic & glycineric Neurotransmission | Dr. Eduardo Candelario-Jalil    |
|     | Feb 19| No Class                                                              |                                 |
| 7   | Feb 22| Neuropharmacology of Acetylcholine- General Aspects  
Drugs acting on Muscarinic Receptors | Dr. Eduardo Candelario-Jalil    |
| 8   | Feb 24| Neurophysiology of Nicotinic Acetylcholine Receptor System  
Nicotinic Acetylcholine Receptor System (Neuropharmacology) | Dr. Eduardo Candelario-Jalil    |
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<tr>
<th>Date</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>Feb 26</td>
<td>MIDTERM EXAM Material thru Feb 24th</td>
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<td>Feb 29</td>
<td>SPRING BREAK</td>
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<td>Mar 2</td>
<td>SPRING BREAK</td>
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<td>Mar 4</td>
<td>SPRING BREAK</td>
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<td>Mar 7</td>
<td>Dopaminergic Receptor System. Therapeutic Approaches (Neuropharmacology) Dopaminergic receptor system. Therapeutic approaches (neuropharmacology) Dr. Habibeh Khoshbouei</td>
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<td>Mar 9</td>
<td>Neurophysiology &amp; Pathology of the Adrenergic System Adrenergic System Neuropharmacology Dr. Habibeh Khoshbouei</td>
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<tr>
<td>Mar 11</td>
<td>Serotonergic Receptor System. Therapeutic Approaches (Neuropharmacology) Serotonergic Receptor System. Therapeutic Approaches (neuropharmacology) Dr. Habibeh Khoshbouei</td>
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<td>Mar 14</td>
<td>Alcohol Dependence Introduction to Neuropeptides Cannabinoids Dr. Habibeh Khoshbouei</td>
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<td>Mar 16</td>
<td>Neurophysiology of Anesthesia Anesthetics - Neuropharmacology Dr. Anatoly Martynyuk</td>
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<tr>
<td>Mar 18</td>
<td>FINAL COMPREHENSIVE EXAM Material from February 8- March 16</td>
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Disclaimer: This syllabus represents our current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.

**GRADING POLICIES:**

The grade will be assigned based on numerical performance on two examinations, one mid-term, and a non-comprehensive exam at the end of the course. Students will be expected to answer all of the questions on each exam.

Student Projects: 20%
Midterm Exam: 40%
Final Exam: 40%

**INSTRUCTIONAL METHODS:** Course materials will be delivered using traditional lectures. Student group learning projects will provide opportunities to review course material and explore topics of interest in more depth. These projects will be created and delivered using VoiceThread, an asynchronous communication learning platform.

**COURSE POLICIES:**

**ATTENDANCE POLICY:** Attendance of lectures is mandatory
QUIZ/EXAM POLICY: There are two exams in this course, a mid-term and a final. They are in-class exams comprised primarily of multiple choice and short answer questions.

MAKE-UP POLICY: You are expected to notify the course directors of any anticipated absences. You should make every effort to take the exams on the days they are scheduled. If extenuating circumstances prevent you from taking a scheduled exam, you will need to schedule an appointment to meet with the course directors to identify an alternative exam date.

ASSIGNMENT POLICY: Group or individual projects must be completed and posted or turned in by the due date/time to obtain credit for the work.

COURSE TECHNOLOGY: We will use VoiceThread, an asynchronous online learning system, as the media for constructing and posting your student projects. While not required, a microphone/video camera is useful when creating VoiceThreads. Most laptops are equipped with these devices. We will enroll you in the VoiceThread course which will allow you to access the VoiceThread system using your Gatorlink name and password. This technology will be introduced during the first class period.

UF POLICIES:

UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES: Students requesting accommodation for disabilities must first register with the Dean of Students Office (http://www.dso.ufl.edu/drc/). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT: Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at http://www.dso.ufl.edu/students.php

NETIQUETTE: COMMUNICATION COURTESY: All members of the class are expected to follow rules of common courtesy when creating VoiceThreads. The course directors reserve the right to remove materials deemed inappropriate.

ABOUT THE LECTURERS

Habibeh Khoshbouei, Pharm.D., Ph.D. is Associate Professor in the Department of Neuroscience and is a Co-director of the course. Email: Habibeh@ufl.edu Phone: 273-8115

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