INTD 5043
Fundamentals of Neuroscience II: Systems Neuroscience
FALL 2019

CLASS DAYS and TIME: Tues & Thurs, 8:00-9:55 am

CLASSROOM: Room 229B Conference Room

COURSE FACULTY: Dan Lodge, Course Director

OFFICE LOCATION and HOURS: By Appointment, 217B

EMAIL: Lodged@uthscsa.edu

TELEPHONE: 210-567-4188

READ THIS DOCUMENT CAREFULLY - YOU ARE RESPONSIBLE FOR ITS CONTENTS.

COURSE DESCRIPTION AND OBJECTIVES

To provide a fundamental understanding of systems neuroscience designed to prepare graduates for professional scientific careers.

Semester credit hours – 3

ATTENDANCE

In order to achieve the expected level of competency, students must be fully engaged. Therefore, attendance for every class session is expected. It is recognized that a student may occasionally arrive late to class due to unexpected traffic problems or inclement weather. However, chronic lateness is considered an unprofessional behavior that disrupts the learning environment for everyone else in the classroom.

TEXTBOOKS

Recommended: Fundamental Neuroscience, Squire, Bloom, McConnell, Roberts, Spitzer and Zigmond (Eds), Academic Press. Copies are on reserve in the library and also available in the Neuroscience Program Coordinators Office, 218B

GRADING POLICIES AND EXAMINATION PROCEDURES

Grading System

Final letter grades are primarily based on your performance on three equally weighted take home exams. Grading may be curved at the discretion of the course director and is based on the following scale:
A = 90-100% B = 80-89% C = 70-79% F = < 70%

REQUESTS FOR ACCOMODATIONS FOR DISABILITIES

In accordance with policy 4.2.3, **Request for Accommodation Under the ADA and the ADA Amendments Act of 2008 (ADAAA)**, any student requesting accommodation must submit the appropriate request for accommodation under the American with Disabilities Act (ADA, form 100) to his/her appropriate Associate Dean of their School and a copy to the ADA Coordinator. Additional information may be obtained at http://uthscsa.edu/eeo/request.asp.

ACADEMIC INTEGRITY AND PROFESSIONALISM

Any student who commits an act of academic dishonesty is subject to discipline as prescribed by the UT System Rules and Regulations of the Board of Regents. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an exam for another person, signing attendance sheets for another student, and any act designed to give unfair advantage to a student or the attempt to commit such an act. Additional information may be obtained at http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/academicdishonestypolicy/

TITLE IX AT UTHSCSA

Title IX Defined:

Title of the Education Amendments of 1972 is a federal law that prohibits sex discrimination in education. It reads "no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance."

University of Texas Health Science Center San Antonio's Commitment:

University of Texas Health Science Center San Antonio (UTHSCSA) is committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, UTHSCSA does not discriminate on the basis of sex in its education programs and activities, and it encourages any student, faculty, or staff member who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to immediately report the incident to the Title IX Director.

In an emergency, victims of sexual abuse should call 911. For non-emergencies, they may contact UPD at 210-567-2800. Additional information may be obtained at http://students.uthscsa.edu/titleix/

EMAIL POLICY

Every student is issued a University e-mail address and account at the time of enrollment. As a matter of University Policy, communications between students and faculty that occur using the student's University e-mail address is considered official business. Therefore, students are expected to check their university email inboxes on a regular basis so that any announcements, instructions, or information regarding this course will be received in a timely way. Missed communications due to inadequate monitoring of incoming emails on the University's email server will never be a valid excuse for unsatisfactory academic progress.

USE OF RECORDING DEVICES

Recording of lectures and other learning activities in this course by any means (e.g., video, audio, etc.) is only permitted if approved by the instructor or required for compliance with Americans with Disabilities Act (ADA).

ELECTRONIC DEVICES

Computers and electronic tablets are allowed only for participating in classroom activities (e.g., viewing slides presented in lecture or conference materials). No texting, tweeting, emailing, web-surfing, gaming, or any use of electronic devices that is not directly connected with classroom activities is permitted.

TENTATIVE CLASS SCHEDULE

INTD 5043

Fundamentals of Neuroscience II: Systems Neuroscience

FALL 2019

General Organization

I. Neurotransmitter System
II. CNS Development
III. Sensory Systems

Exam 1 – covers 20 lecture hours

IV. Autonomic and Motor Systems
V. Neuroendocrine Systems
VI. Limbic and Integrative Systems
VII. Genetic Aspects of Neuroscience

Exam 2 – covers 20 lecture hours

VIII. Clinical Aspects of Neuroscience

Exam 3 – covers 14 lecture hours

Module I. – Neurotransmitter System - Chapters: 7-10

Tuesday August 6
8:00-9:00 - Identification and organization of neurotransmitter systems - **Morilak**
9:00-9:55 - Synthesis metabolism and regulation of neurotransmitters - **Morilak**

Thursday August 8
8:00-9:00 - Mediation vs. modulation; Brain circuits - **Morilak**
9:00-9:55 - Techniques for measuring neurotransmitter release in vivo – **Daws**

Tuesday August 13
8:00-9:00 – Neurotransmitter transporters I - **Daws**
9:00-9:55 – Neurotransmitter transporters II - **Daws**

Module II. – CNS Development - Chapters: 14,17,20

Thursday August 15
8:00-9:00 – Early neural development – **Kokovay**
9:00-9:55 – Adult Neurogenesis – **Kokovay**

Tuesday August 20
8:00-9:00 – Synapse formation I. – **Sia**
9:00-9:55 – Synapse formation II. – **Sia**

Thursday August 22
8:00-9:00 - Peripheral sensory receptors, receptor potentials & sensory coding – **Hargreaves**
9:00-9:55 - Spinal and ascending somatic sensory pathways – **Hargreaves**

Module III. - Sensory Systems - Chapters: 22-25, 27

Tuesday August 27
8:00-9:00 - Myelination - **Kim**
9:00-9:55 – Development of auditory processing - **Kim**

Thursday August 29
8:00-9:00 - Pain, Nociception and Antinociception I. – **Jeske**
9:00-9:55 - Pain, Nociception and Antinociception II. – **Jeske**

Tuesday September 3
8:00-9:00 – Visual system - Peripheral mechanisms – **Glickman**
9:00-9:55 - Visual system - Central processing I – **Glickman**

Thursday September 5
8:00-9:00 - Visual system - Central processing II - **Glickman**
9:00-9:55 – Visual system - Central processing III - **Glickman**

EXAM 1: 20 lecture hours - Receive Exams by Monday Sep 9th. Return them by Monday Sep 16th at 5:00pm.

Module IV. – Autonomic and Motor Systems - Chapters: 28-32

Tuesday September 10
8:00-9:00 – The Autonomic Nervous System – **C. Boychuk**
9:00-9:55 – Neuronal regulation of cardio-respiratory function – **C. Boychuk**

Thursday September 12
8:00-9:00 - Basal ganglia: anatomy, neurochemistry, function – **J. Boychuk**
9:00-9:55 - Aging-related changes in motor function: Parkinson's Disease/ALS – **J. Boychuk**

Module V. – Neuroendocrine Systems - Chapters: 34-40

Tuesday September 17
8:00-9:00 – Hypothalamus I – **Fujikawa**
9:00-9:55 – Hypothalamus II – **Fujikawa**

Thursday September 19
8:00-9:00 – Neuroimmunology I: Interactions between the immune system and the brain – **O'Connor**
9:00-9:55 – Neuroimmunology II: Neurodegeneration and neuroimmunological disorders – **O'Connor**

Module VI. – Limbic and Integrative Systems – Chapters: 43-44

Tuesday September 24
8:00-9:00 – The forebrain limbic system - **Morilak**
9:00-9:55 – Integrating autonomic, endocrine & behavioral responses: Arousal, fear & stress - **Morilak**

Thursday September 26
8:00-9:00 –Hippocampus I: Circuitry, neurochemistry, LTP – **Lodge**
9:00-9:55 – Hippocampus II: Function in memory and other processes – **Lodge**

Tuesday October 1
8:00-9:00 – Motivation and consummatory behavior – The brain reward system I – **Collins**
9:00-9:55 – Motivation and consummatory behavior – The brain reward system II – **Collins**

Thursday October 3
8:00-9:00 – Learning and Memory – basic concepts and neural mechanisms – **Koek**
9:00-9:55 – Drug effects on different models of conditioning – **Koek**

Module VII. – Genetic aspects of Neuroscience

Tuesday October 8
8:00-9:00 – Model Systems I – **Banerjee**
9:00-9:55 – Model Systems II – **Banerjee**

Thursday October 10
8:00-9:00 – Schizophrenia I: Etiology and neural bases - **Lodge**
9:00-9:55 – Schizophrenia II: Psychopharmacology and treatment - **Lodge**

Tuesday October 15
8:00-9:00 – Epigenetics I: Basic Mechanisms –**O'Connor**
9:00-9:55 – Epigenetics II: Association with Disease –**O'Connor**

Break for SFN Oct 19th-23rd

EXAM 2: 22 lecture hours - Receive Exams by Friday Oct 25th. Return them by Friday Nov 1st at 5:00pm.

Module VIII. – Clinical Aspects of Neuroscience – supplemental reading material

Tuesday October 29
8:00-9:00 – Sleep and Arousal I: Sleep mechanisms and circadian physiology – **Ingmundson**
9:00-9:55 – Sleep and Arousal II: Neuroanatomy and neurotransmitter systems– **Ingmundson**

Thursday October 31
8:00-9:00 – Sleep Disorders I: Narcolepsy and sleep apnea – **Ingmundson**
9:00-9:55 – Sleep Disorders II: Movement disorders of sleep, parasomnias– **Ingmundson**

Tuesday November 5
8:00-9:00 – Psychopathology and Psychotherapeutics I – **Frazer**
9:00-9:55 – Psychopathology and Psychotherapeutics II – **Frazer**

Thursday November 7
8:00-9:00 – Neurogenetics and neurogenetic disorders I– **Seshadri**
9:00-9:55 – Neurogenetics and neurogenetic disorders II – **Seshadri**

Tuesday November 12
8:00-9:00 – Autism Spectrum Disorders I – **Lee**
9:00-9:55 – Autism Spectrum Disorders II – **Lee**

Thursday November 14
8:00-9:00 – Alzheimer's Disease I – **Frost**
9:00-9:55 – Alzheimer's Disease II – **Frost**

EXAM 3: 12 lecture hours - Receive Exams by Monday Nov 18th. Return them by Monday Nov 25th at 5:00pm.

Final graded exams due from Lecturers by Monday December 2nd.