

HUMAN SYSTEMS NEUROSCIENCE

Fall Semester, 2006: TTH 10:40-11:55

This course is a systems level neuroscience course, with a focus on human diseases. The course is jointly coordinated between ASU (Dr. Helms Tillery) and the Barrow Neurological Institute (Dr. Vu). The lecture portion of the class will cover the first 13 weeks. At week 13, the course will transition on-site to the BNI, where in addition to a few more lectures, students will have the opportunity to observe work in several clinical settings, including grand rounds, the neurosurgical suite, imaging facilities, and others. Our aim is for the students to leave the course understanding core principles and applications in the operation of neuronal systems, and to have an appreciation of where those principles have found application in clinical practice.

Readings will be drawn from Principles of Neural Science, 4th Edition along with papers from the primary and review literature.

Grades will be based on performance on two exams and one paper that combines discussion of basic neuroscience and clinical application for an unresolved pathology in human neurological practice.

Tentative Lecture Schedule

Date	Topic	Readings	Instructor
Week 1			
August 22	Introduction, Levels of analysis and measurement	K,S&J 1, 2	Helms-Tillery / Vu
August 24	Membrane biology and potentials	K,S&J 7, 8	Steinmetz
Week 2			
August 29	Action potentials & synaptic currents	K,S&J 6, 9, 10	Steinmetz
August 31	Anatomical organization and evolution of the central nervous system	K,S&J 52	Coursen
Week 3			
September 5	The functional organization of perception & movement	K,S&J 18, 19, 20	Helms Tillery
September 7	Coding of sensory information	K,S&J 21	Helms Tillery
Week 4			
September 12	Somatosensory physiology	K,S&J 22, 23	Helms Tillery
September 14	Vision: the eye	K,S&J 25, 26	Macknick
Week 5			

September 19	LGN and Area V1: anatomy, physiology & perception	K,S&J 27, 28	Martinez-Conde
September 21	Auditory perception	K,S&J 30, 31	Vu
Week 6			
September 26	The senses of smell and taste	K,S&J 32	Macknick
September 28	The organization of movement	K,S&J 33, 38	Helms Tillery
Week 7			
October 3	Organization of the neuromuscular plant and spinal reflexes	K,S&J 34, 36	Jung
October 5	Exam 1		
Week 8			
October 10	Locomotion	K,S&J 37	Hamm
October 12	Pathologies of locomotion	K,S&J 35, 41	Abbas
Week 9			
October 17	Cerebellar circuits structure & function	K,S&J 42	Horn
October 19	The basal ganglia	K,S&J 43	Castañeda
Week 10			
October 24	Neural control of the hand	TBA	Santello
October 26	Pathologies of hand control	TBA	Van Gemmert
Week 11			
October 31	The control of gaze	K,S&J 39	Vu
November 2	Speech and Language	K,S&J 59	Liss
Week 12			
November 7	Psychiatric Disorders	K,S&J 60,61	Neisewander
November 9	Learning & memory	K,S&J 62	Vu
Week 13			
November 14	Neuronal plasticity	K,S&J 63	Valla
November 16	Pain, temperature, itch and other feelings from the body	K,S&J 22, 24	Craig
Week 14			
November 21	Movement disorders	TBA	Shill
November 23	THANKSGIVING		
Week 15			
November 28	Cognitive disorders	TBA	Bambakidis
November 30	Non-invasive imaging of	TBA	Debbins

	brain structure & function		
	Translating bioengineering into neurosurgical principles	TBA	Preul
Week 16			
December 5	Translating bioengineering into neurosurgical principles.	TBA	Preul
December 4-8	Observation of clinical procedures	TBA	Preul/Spetzler
Finals Week	Exam 2		

Exam Policies:

Exams will focus on material discussed in lecture or on readings that are specifically designated. Make-up exams will be administered only in the case of: 1) documented medical emergencies or catastrophes, or 2) interviews for graduate or professional schools, or attendance at professional meetings, if approved by the instructors in advance of the exam.

Human Systems Neuroscience on Blackboard:

The course syllabus, lecture schedule, lecture notes, additional readings, discussion boards, and various announcements will be posted online using Blackboard. This is an essential resource for this course so get familiar with it as soon as possible. Access to the course on Blackboard is via myASU: <https://myasucourses.asu.edu/>. If you are enrolled in the course, you should automatically be enrolled for Fall 06. If you are enrolled but do not see BME 598, see Dr. Helms Tillery ASAP.

University Withdrawal and Incomplete Policies:

The unrestricted withdrawal deadline is October 27 (in person) or October 29 (online). University and course policy states that after December 5, withdrawals (and a grade of W) will be given only to students with documented medical problems or personal issues warranting a compassionate withdrawal. A grade of Incomplete (I) is given when a student cannot complete a course due to health problems or other emergencies and has a passing grade; incompletes must be completed within a year. Incompletes will not be given because of poor grades.

Academic Dishonesty:

For the purposes of this course, any effort at deception regarding efforts in the class will be considered as cheating. Obvious examples include copying on exams and unacknowledged use of outside sources in preparing papers. Less obvious examples include pretended use of outside materials and false statements regarding attendance. When individuals cheat to elevate their scores, this can (a) lower the grades of honest, hard-working students and (b) establish a pattern of behavior that we wish neither to promote nor condone in graduates from ASU. Therefore, we will not tolerate cheating. Violations of the Student Code of Conduct are subject to university discipline. Action may include a zero for an exam, a grade of "E" in the course, or referral to the Fulton School of Engineering or College of Liberal Arts and Sciences, as appropriate, for more severe action such as suspension or a final grade of "XE" which appears on official and unofficial transcripts with a notation reading "failure due to academic dishonesty."