

SAMPLE

MCB 165: Neurobiology of Disease.

Course Description:

The molecular, cellular, and neural circuit basis of neurological disease. Includes neurochemistry and reward systems, neural development and its disorders, addiction, neurodegenerative and neuropsychiatric disorders. (SP) Caporale

Organization:

The course consists of 2 hours of lecture and 1 hour of discussion per week. Discussion sections will be led by the instructor in conjunction with a GSI.

Primary literature and discussion sections:

You will read primary scientific literature in this class, and discuss it in Friday sections. To prepare for discussion, you must answer several short questions on a "Reading Guide" about each week's paper, and bring your answers to section with you. These will be the basis for discussion. Your answers to the reading guide questions will be turned in at section. Completion of the Reading Guide questions, and active participation in discussion, will contribute to your course grade.

Pre-requisites:

This course is designed as an elective after the 160-161 sequence. MCB 160 is pre-requisite, and MCB 161 is prerequisite or co-requisite.

Textbook & Readings:

Kandel Schwartz & Jessel, Principles of Neuroscience. McGraw-Hill, 5th Ed. (2012).

Zigmond, Coye & Rowland. *Neurobiology of Brain Disorders: Biological Basis of Neurological and Psychiatric Disorders*. Academic Press. 1st Ed. (2014)

Unfortunately, there is not one single textbook that covers all these topics in adequate level of details. We will use the book Principles of Neural Science, by Kandel, as it is one of the most comprehensive resources available and we hope that students will have it from MCB 160. However, **due to the novelty of some of the topics that we will cover, we will be complementing textbook readings with current reviews and articles.**

Grading Policy

Grades on this class are based on exams (2 midterms, 1 final), the completion of literature analysis guides (5) and discussion section participation. The final exam is comprehensive.

Course grades will be calculated as follows:

Reading Guide Questions	5 %
Discussion Participation	5 %
Two Midterms	50 % (25 % each)
Final	40 %

SAMPLE

Schedule:

Day	Lec #	Topic	Chap	Discussion (Friday)
Tu	1	Introduction to the course		How to read primary research papers
Th	2	Neurotransmitters: synthesis, receptors, degradation	KS: 11, 12, 13	
Tu	3	Neuromodulators: peptides, catecholamines	KS: 13	Glia, blood flow and fMRI
Th	4	Glia in health and disease	KS: 4 & ZC: 30	
Tu	5	Presynaptic modulators: cannabinoids, adenosine	KS: 11, 13	Homeostatic and Hebbian Plasticity
Th	6	Synaptic Plasticity	KS: 66	
Tu	7	Psychoactive Drugs & Reward Systems: VTA and nACC	KS: 46, 49	Circuit Basis for Addiction
Th	8	Addiction	KS: 49 & ZC: 35	
Tu		In-Class Exam I (Lec 1-8)		Autoimmune disease and nervous system
Th	9	The mysterious enteric nervous system	KS: 47	
Tu	10	Review of Development and Synaptogenesis	KS: 52-56	Autism genetics and risk
Th	11	Autism	KS: 64 & ZC: 2, 6	
Tu	12	Fragile X	KS: 64 & ZC: 8	mGluRs and Fragile X
Th	13	Other DD: Down Syndrome and ADHD	ZC: 4, 5	
Tu	14	Prion Diseases	ZC: 23	Neurobiology of aging
Th	15	The Aging Brain	KS: 59	
Tu	16	Parkinson and Huntington Disease	KS:43 & ZC:19,20	Axonal regeneration after injury
Th	17	Spinal cord organization and injury.	ZC: 15	
SPRING BREAK				
Tu	18	Stem cells, regeneration, and repair.	KS: 57	Mental illness and society
Th		In- Class Exam II (Lec 9-18)		
Tu	19	Overview of Mood and Psychotic Disorders	KS: 63	Animal models of psychiatric disorders
Th	20	Depression and Manic Disorder: Symptoms	ZC: 40, 43	
Tu	21	D&MD: Monoamine, corticoid and neurotrophic hypothesis	ZC: 40, 43	Synaptic plasticity in amygdala
Th	22	Anxiety Disorder, PTSD and the Amygdala	ZC: 37	
Tu	23	Schizophrenia: Symptoms and Neuropathology	KS: 62 & ZC:39	Drug development for novel therapeutics
Th	24	Schizophrenia: Glutamate and Dopamine Hypothesis	KS: 62 & ZC:39	
Tu	25	Dementia and Alzheimer's Disease	KS: 59 & ZC: 21	Review, Principles, Challenges
Th	26	Epilepsy	KS: 50 & ZC: 17	
RRR week (Lectures on Tu and Th will meet to review Lectures 1-18)				
Fri	GSI Led Review Session on Lectures 21-28 (Location & Time TBD)			
TBD	Comprehensive Final Exam @ , Time TBD , Location TBD			