2006-2007 Course Calendar - Neuroscience

Meeting Hours for entire semester:
Monday - Friday 1:00 - 2:20 p.m.
Room 1200, COM

August 28	August 29	August 30	August 31	September 1
Course introduction, Neurocytology: role of intracellular organelles; role of organelles specific to neurons; structure and function of neurons and glial cells, blood brain barrier Ouimet	**Gross anatomy Orientation and brain development:** three-dimensional structure of the brain and relationships between major brain components in brains sectioned in various planes Ouimet	**Spinal cord 1:**structure of and intrinsic connections within the spinal cord; spinal cord nuclei; dorsal root ganglia; dorsal and ventral roots; reflex arcs; ANS Ouimet	**Spinal cord 2:**long tracts in the spinal cord with emphasis on the corticospinal tract, the anterolateral system, and the dorsal columns Ouimet	**Spinal cord 3:**spinal cord clinical correlations Maitland
Sept. 4	**Sept. 5**	**Sept. 6**	**Sept. 7**	**Sept. 8**
Holiday	**Resting Potential:**selective permeability, Nernst equation, sodium pump, Goldman equation, pacemaker potentials Trombley	**Excitability, membrane properties:**thresholds, trigger zones, excitability, passive membrane properties Trombley	**Action potential:**shape of the action potential, control of ionic conductances, voltage clamp, voltage gated channels, myelin, electrophysiology of nerve bundles, conduction velocity, impulse conduction, conduction bloc Trombley	**Medulla:**Structure of medulla, cranial nerves number 9, 10, 11 and 12; nuclei of the medulla, long tracts through the medulla Ouimet
Sept. 11	**Sept. 12**	**Sept. 13**	**Sept. 14**	**Sept. 15**

Pons: structure of the pons, cranial nerves number 5, 6, 7 and 8; nuclei of the pons, long tracts through the pons Ouimet	**Midbrain:** structure of the midbrain, cranial nerves number 3 and 4; nuclei of the midbrain, long tracts through the midbrain Ouimet	**The cerebellum:** Cerebellar structure and function, deep cerebellar nuclei, red nucleus, cerebellar peduncles Ouimet	**synaptic transmission and receptors I :** synaptic transmission, synaptic potentials, acetylcholine and the neuromuscular junction, inhibition, myasthenia gravis Olcese	**Lab 1. brainstem and cerebellum:** the cranial nerves, the structure of the brainstem, the cerebellum and radiologic images Ouimet/Maitland
Sept. 18	Sept. 19	Sept. 20	Sept. 21	Sept. 22
synaptic transmission and receptors II : second messenger systems, indirectly gated channels, presynaptic mechanisms, quantal release, integration, transmitter criteria Olcese	**synaptic transmission and receptors III:** survey of neurotransmitters (e.g. glutamate, GABA, acetylcholine, DA, NE, E, substance P.,NPY,) and their receptors Olcese	**Nerve and muscle:** neuromuscular junction, motor-neuron units, nerve muscle interactions, reflexes Meredith	**Review and problem solving** Ouimet	**Exam 1**
Sept. 25	Sept. 26	Sept. 27	Sept. 28	Sept. 29
Nerve and muscle: Part II Meredith	**basal ganglia:** caudate, putamen, globus pallidus, substantia nigra, nucleus subthalamicus,Parkinson's, Huntington's, hemiballismus Ouimet	**TBL 1** Maitland and Team	**somatosensory system:** sensory systems in skin, muscles, tendons Meredith	**Lab 2: Basal ganglia** caudate, putamen.globus pallidus, nigra etc. radiological images Ouimet/Maitland
Oct. 2	Oct. 3	Oct. 4	Oct. 5	Oct. 6
reticular	**limbic system:** the	**physiology of**	**Neuroradiolog**	**Lab 3:Limbic**

formation: nuclei of the reticular formation in the midbrain pons, and medulla; functions and connections Ouimet	emotional brain including amygdala, hippocampus, septum, n. accumbens, Papez circuit and hypothalamus Ouimet	**hearing;** structure and function of the ear, **Hypothalamus** anatomical organization of the hypothalamus and ANS Meredith	**y** Beekler	**System** Ouimet/Maitland
Oct. 9	Oct. 10	Oct. 11	Oct. 12	Oct. 13
vestibular system: the physiology of vestibular function; the inner ear; balance Meredith	**visual system:** the physiology of vision; structure and function of the eye; central visual pathways Meredith	Chemical Senses Taste and Olfaction: Physiology of Taste and Olfaction; Structure and function of taste and olfactory periphery; Central pathways. Meredith	**Thalamus:** structure of the thalamus and function of the major nuclei; connection of the major nuclei with cortical and subcortical targets Ouimet	**Lab 4. White matter:** major tracts through brain OR **Parkinson disease meeting** Ouimet/ Maitland
Oct. 16	Oct. 17	Oct. 18	Oct. 19	Oct. 20
Cortex I: fundamentals of cortical structure and relationship to thalamus; prefrontal motor and parietal cortex structure and function Ouimet	**Cortex 2:** structure and function of temporal and occipital cortex Ouimet	**TBL 2** Maitland and Ouimet	**Review and problem solving** Team	**Exam 2**
Oct. 23	Oct. 24	Oct. 25	Oct. 26	Oct. 27
Hypothalamus and Homeostasis: regulation of feeding, drinking, body temp, hormone release etc.	**Stress and the HPA:** the function of the hypothalamic-pituitary-adrenal axis; biology of chronic and acute stress Houpt	**TBL 3** Maitland and Ouimet	**Depression:** biogenic amines and their pharmacology at the synapse; uptake blockers,	**Pain:** Pathways involved in sensing pain and their modulation Berkeley

Houpt			MAOI's etc. Houpt	
Oct. 30	Oct. 31	Nov. 1	Nov. 2	Nov. 5
Case history review Ouimet / Maitland	**Plasticity, repair and regeneration:** ability of the brain to change in response to insult Houpt	**TBL 4** Maitland and Ouimet	**Vasculature and Meninges:** blood supply to the brain and spinal cord; thinking in terms of vascular fields; epidural, subdural and subarachnoid bleeds Ouimet	**Lab 5:**Thalamus, cerebral cortex and vasculature Ouimet / Maitland
Nov. 6	Nov. 7	Nov. 8	Nov. 9	Nov. 10
Drugs of abuse: biological basis of drug abuse; cocaine, amphetamine, nicotine, alcohol etc. Kabbaj	**Learning and memory:** biological basis of synaptic modification Houpt	**TBL 5** Maitland and Ouimet	**Sleep:** circadian structure and control of sleep; meaning of brain waves during sleep; disorders of sleep such as apnea and narcolepsy Olcese	**Holiday**
Nov. 13	Nov. 14	Nov. 15	Nov. 16	Nov. 17
Aging; brain death: normal aging, neurodegenerative disorders such as Alzheimer's disease; biological and ethical considerations	**Schizophrenia;** dopamine theory of schizophrenia; relationship to limbic system; Ouimet	**TBL 6** Ouimet	**Review and Problem Solving** Ouimet	**Exam 3**

of brain death. Ouimet/Brummel -Smith				
Nov. 20	Nov. 21	Nov. 22	Nov. 23	Nov. 24
Epilepsy: etiology and clinical manifestations of epilepsy Maitland	**primer on neuropharmacology:** drug action at synapses and axons Patrick	**TBL 7** Maitland and Ouimet	**Thanksgiving**	**Thanksgiving**
Nov. 27	Nov. 28	Nov. 29	Nov. 30	Dec. 2
Review of Peripheral Nerves	**Levels of Disconnection** Maitland	**Clinical Presentation of Demyelinating diseases** Maitland	**Coma** Maitland	**Review and Problem Solving** Ouimet
Dec. 4	Dec. 5			
Shelf Exam	**Final Exam**			