STUDY SHEET FOR EXAM 1: PSYCH 2210

FORMAT:
- 45 Multiple Choice and True/False Questions (3 pts each)
- Exam is during class time

TEXT MATERIAL:
*Historical Background: Chap 1*: Focus on material from pages 1-7; *Chap 4*: pages 96-98.
*Basic Anatomy: Chapter 3*: p 55-72.
*Neurons & Glia: Chapter 2*: p 23-26; 33-35

*Signaling: Chapter 2* - p27-33; p36-41

LECTURE MATERIAL:
*Weeks 1 & 2*

**Historical Roots**
- Aristotle
- Galen
- Hippocrates
- DaVinci
- Descartes
- Dualism
- Thomas Willis
- Franz Gall; Phrenology
- Localization of Function
- Paul Broca; Broca’s Area

**Experimental Design in Neuroscience**
- Somatic Intervention
- Behavioral Intervention
- Independent Variable
- Dependent Variable
- Within-Subject Design
- Between-subject Design
- Control Group
- Correlation
- Positive correlation
- Negative Correlation
- Reductionism
- Levels of Analysis
- Neuroplasticity
Week Two: Anatomy: know definition/function of regions below

I. Gross Anatomy
Gray matter
White Matter
Corpus Callosum
Ventricles & CSF

II. Frames of Reference
Anterior/rostral
Posterior/Caudal
Superior/dorsal
Inferior/ventral
Lateral
Medial
Coronal Section
Sagittal Section
Axial Section

III. Cortex
Gyri
Sulci

Cortical Layers: Evolutionary Development
- Neocortex
- Mesocortex
- Allocortex

Ways of Dividing the Cortex:
  1. Pattern of Gyri & Sulci: Lateral fissure; precentral gyrus; central sulcus;
     postcentral gyrus; s. temporal gyrus; occipital gyrus
  2. Brodmann’s Areas
  3. By Function

Lobes & Corresponding Functions: Association vs. Primary/Motor Cortex
- Frontal
- Parietal
- Temporal
- Occipital

“What” vs. “Where” pathways

Subcortical Structures
- Limbic System: cingulate gyrus, hippocampus, amygdala; olfactory bulb
- Basal Ganglia: role in Huntington’s; parkinson’s; OCD
- Diencephalon: Thalamus; hypothalamus

Midbrain
- Superior Colliculi
- Inferior Colliculi
- Substantia Nigra
- Reticular Formation

Hindbrain
Week Three: Cells in the Brain/Electrical & Chemical Signaling

Neurons:
- Neuron Doctrine
- 4 Zones (input; integration; conduction; output)
Be able list functions and location in appropriate zone for
- Dendrites
- Soma or Cell Body
- Axon
- Nodes of Ranvier
- Axon Terminal (Terminal Button)
- Myelin Sheath
- Neuron Doctrine

2. Glia: know functions for
- astrocytes
- microglia
- oligodendrocyte
- Schwann cells

Electrical Signaling: within a neuron

Resting Potential (RMP)
- Definition of RMP
- how it is measured: i.e., Hodgekin & Huxley expt
- ion
- Polarization
- location of Na+ ions; K+ ions
- forces maintaining RMP & generating potential energy
  Selective Permeability: gated vs. nongated channels
  Diffusion
  Electrostatic Force
  Sodium-Potassium Pump

Action Potential:
- Excitatory vs. Inhibitory inputs
- depolarization vs. hyperpolarization
- Threshold
- Distinction from graded potential
- ionic events at threshold (i.e., what happens to Na+ ions)
- Electrical & Ionic changes during various phases of Action Potential
- Properties: All-or-none; Rate Law
- Propagation: Conduction down axon; direction of travel; what happens at nodes of Ranvier; saltatory conduction; myelin and multiple sclerosis
Chemical Signaling: between neurons
- Vesicles: location and function
- Exocytosis; role of Ca++
- Steps in Synaptic Transmission
- Parts of the synapse: pre-synaptic terminal; synaptic cleft; post-synaptic membrane
- Neurotransmitter Effects on Receptors
- Post-synaptic potentials: IPSP vs EPSP (definitions, ions responsible)
- Reuptake (transporters) vs. Enzymatic Deactivation
- Loewi Experiment: identification of Acetylcholine

Week Four: Neuropharmacology
Mechanisms of Action of Drugs
Agonist vs. antagonist effects
Know drug examples given in class and how they work
- novocaine; TTX
- botox
- cocaine vs. methamphetamine
- aricept
- atropine
- sarin
- nicotine
- Hallucinogens
Drug vs. Neurotransmitter effects

Secrets of the Mind Video- know symptoms and brain mechanisms associated with each case study
Phantom Limb
Blindsight
Neglect Syndrome
Capgras Delusion
Temporal Lobe Epilepsy