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
Basic Anatomy: Chap 2: p 21-23; p29-30; Chapter 3: p 49-61

Signaling: Chap 2: p 24-29

Neuropharmacology: Chap 2: 36-40

LECTURE MATERIAL:
Week 1
Myths about Brain

Historical Roots
Aristotle
Galen
Hippocrates
DaVinci
Descartes
Dualism/Monism
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
Correlational Study
Positive correlation
Negative Correlation
Reductionism
Levels of Analysis
Neuroplasticity vs. Neurogenesis
Nature vs. nurture: genetics
Week Two: Anatomy: know definition/function of regions below

I. Gross Anatomy
Gray matter
White Matter
Corpus Callosum
Ventricles & CSF
Meninges; 3 layers; meningitis

II. Frames of Reference
Anterior
Posterior
dorsal
ventral
Lateral
Medial
Coronal Section
Sagittal Section
Horizontal Section

III. Cortex
Gyri
Sulci
Ways of Dividing the Cortex:
  1. Landmarks: Pattern of Gyri & Sulci: Lateral fissure; precentral gyrus;
central sulcus; postcentral gyrus; s. temporal gyrus; occipital gyrus
  2. Cortical Layers: Evolutionary Development
     Neocortex
     Mesocortex
     Allocortex
  3. Cytoarchitecture: Brodmann’s areas

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
- Axon Hillock

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

Know Lobes & Corresponding Functions: Association vs. Primary sensory/motor functions for each:
- Frontal
- Parietal
- Temporal
- Occipital
“What” vs. “Where” pathways

Subcortical Structures
- Limbic System: function in memory; emotion; learning
- Basal Ganglia: role in Huntington’s; Parkinson’s; OCD
- Diencephalon: Thalamus; hypothalamus

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

**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. non-gated channels
  - Diffusion
  - Electrostatic Force
  - Sodium-Potassium Pump

**Action Potential:**
- Excitatory vs. Inhibitory inputs
- depolarization vs. hyperpolarization
- Threshold
- Trigger zone on axon
- Distinction from graded potential
- ionic events at threshold (i.e., what happens to Na+ ions; K+ 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

**Week Four: Neuropharmacology**

*Neurotransmitters*
- Loewi Experiment: identification of Acetylcholine

*Mechanisms of Action of Drugs*
Know drug examples given in class; which neurotransmitters they affect and how-
- novocaine; TTX
- botox
- cocaine vs. methamphetamine
- aricept
- heroin (opiates)
- narcan
- LSD & Hallucinogens

**Agonist vs. antagonist 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