Study Guide for Exam I
Methods, Neuroscience, Sensation, Perception, Learning

Required Readings:
Gleitman: Ch. 1, 3, 4, 5, 7
Sacks: Stories 1, 8
Skinner, pp. 1-95, Beyond Freedom and Dignity

Video clips assessed in class:
John, Visual Agnosia
Phobias (learning)
Angle perception—babies (perception)
Language perception—babies (learning)
Gazzaniga Split Brain patient – neuroscience

Research Methods in Psychology

Terms to know:

- dependent variable
- independent variable
- hypothesis
- population
- sample
- random sampling
- blind/double-blind design

Think about any of the experiments that we've talked about in class, or ones you've read about. What is the dependent variable? What is the independent variable?

What do internal and external validity mean in terms of research methods? How can you protect each?

What are the differences between true experiments, quasi-experiments and correlational experiments?

Neuroscience I

Terms to know:

- cell body
- dendrite
- axon
- myelin
- axon terminal
- white matter
- gray matter
- efferent
- afferent
- interneurons
- resting state
- depolarizing phase
- repolarizing phase
- overshoot
- undershoot
- threshold
- refractory phase
- saltatory conduction
- synaptic vesicle
- synaptic cleft/synapse

agonist
antagonist
receptor
pituitary
hormones

What are the structural elements of a typical neuron? Which portion receives input and which portion releases neurotransmitter? Which direction does information typically travel along the neuron?

What is the function of myelin?

What is the resting potential? What is an action potential? What are the different phases of the action potential and what role do sodium channels play during an action potential?

How do neurons use neurotransmitters to communicate?

Describe the contribution that Otto Loewi made to the understanding of chemical communication.

Where are neurotransmitters stored? What is the space between the presynaptic and postsynaptic terminal called? How is the action of a neurotransmitter halted?

What is the difference between an agonist and antagonist?

How is hormonal communication controlled in the body?

<u>Neuroscience II</u>
Terms to know:
central nervous system
autonomic nervous system
    sympathetic division
    parasympathetic division
hemisphere
longitudinal fissure
brainstem (thalamus, hypothalamus, midbrain, pons, medulla)
cerebellum
limbic system (hippocampus, amygdala)
cortex
lobes – frontal, parietal, occipital, temporal
corpus callosum
contralateral organization
split brain studies

For each brain region, be able to describe the primary function that the region is known to be involved in.

What was the main finding of the Greebles study? What does the finding tell us about the fusiform gyrus?

Primary sensory cortices are organized very systematically? Describe this organization. How can the organization change depending on changes in sensory input?

Split brain patients can name an object shown to the right visual field, but cannot name objects shown to the left visual field – what about the specific damage to their brains, organization of sensory input and lateralization of function leads to this difference?

Sensation

Terms to know:

- transduction
- absolute threshold
- just noticeable differences
- Weber's law
- specificity theory vs pattern theory
- adaptation
- photoreceptors – rods & cones
- bipolar cells
- ganglion cells
- fovea
- blind spot
- lateral inhibition
- trichromatic theory
- opponent-process

Describe the commonalities shared by all sensory systems.

How does what we've learned about the world contribute to our perceptions?

Describe the structural components of the eye, including the cells that make up the retina. Vision begins when light enters the cornea – but then what happens? How does visual information get from the retina to primary visual cortex?

What is the function of lateral inhibition? How does it work?

How do trichromatic color theory and opponent-process theory explain color vision? Use these theories to explain how the afterimage of the flag appeared in the normal colors of the American flag.

Perception

Terms to know:

- Rods/cones
- Visual cortex
- Temporal lobe
- What/Where pathways
- Gestalt view
- Linear perspective
- Familiar size
- lateral inhibition
- occipital lobe
- parietal lobe
- structuralist view
- Gibsonian view
- interposition
- Gestalt principles

Be able to explain a visual illusion, using the ideas and principles stated above.

Explain the Hermann grid (illusory dots)
Explain Mach bands and edge detection.
How does the angle video demonstrate that experience contributes to perception?
Address the roles of what you know (top-down) and what your eye can pick up (bottom-up) on perception.
Describe Dr P or Eyes right and explain what brain abnormalities would account for their visual deficits.

Learning

Concepts to know:

Habituation	Classical Conditioning
Operant Conditioning	Dishabituation
CS, US, CR, UR	Parameters like practice, contiguity
Reinforcement, Punishment	Schedules of Reward, Punishment

Examples of each type of learning in everyday life.
Examples of each type of learning used as a method to investigate something in psychology.
Examples of each type of learning in clinical populations (anxiety, phobias, avoidance)