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Course Outline for PSYC 4

BRAIN, MIND, AND BEHAVIOR

Effective: Fall 2014

I. CATALOG DESCRIPTION:
PSYC 4 — BRAIN, MIND, AND BEHAVIOR — 3.00 units

Introduction to the field of biopsychology. The biopsychology of cognitive, perceptual, emotional, developmental, and social processes. Includes the biopsychology of personality, gender, emotions, learning, learning disabilities, drugs, neurological and developmental disorders, and mental health. Examination of information and theory for practical application.

3.00 Units Lecture

Prerequisite
PSYC 1 - General Psychology

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture Hours:	54.00
Total Hours:	54.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

A. PSYC1

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

1. define and use basic biological, physiological, and psychological terminology of the neurosciences
2. appraise the scientific approaches used in methodologies for the study of brain-behavior relationships and the associated ethical considerations.
3. describe the basic organization of the human brain and nervous system
4. describe the processes of neural conduction and synaptic transmission
5. articulate the basic roles of the major structures and regions of the brain in behavior
6. compare and contrast the roles of the neurotransmitters in behavior
7. describe the basic roles of the endocrine system in human behavior
8. discuss the neural processes involved in drug action, drug dependence and addiction
9. analyze the biopsychological processes involved in emotions, stress, cognition, and social behavior
10. describe the basic stages and processes involved in prenatal and post natal brain development, and how these processes relate to behavior
11. distinguish between the roles of the cerebral hemispheres in behavior
12. critically analyze the biopsychology of sexual behavior, sexual orientation and gender differences
13. describe and critically analyze the biopsychology of individual differences
14. examine the basic biopsychological processes in learning
15. distinguish between the major categories and causes of learning disabilities
16. discuss the biopsychological processes involved in mental health disorders, such as schizophrenia, mood and anxiety disorders
17. analyze the effects of neurological diseases, disorders, and injuries: such as strokes, Alzheimer's Disease, and Parkinson's Disease
18. distinguish between normal and abnormal changes associated with aging

V. CONTENT:

A. Introduction to biopsychology
   1. Overview of the field of biopsychology, including historical and contemporary approaches
   2. Critical analysis and discussion of the brain-mind relationship
B. Methods of study in biopsychology
   1. Overview of the basic scientific methodology used in biopsychology
   2. Thinking critically about biopsychology
   3. Research ethics applied to human and non-human animals

C. Organization of the nervous system
    1. Overview of basic brain/nervous system anatomy
        a. Major divisions of the nervous system
        b. Basic geography of the brain
        c. Major structures of the brain
        d. Meninges, ventricles, and cerebrospinal fluid
D. Cells of the nervous system
    1. Overview of basic neuron components and glial cells
    2. Function of each type of neuron
E. The synapse: neuronal communication
    1. Overview of the processes involved in neuronal communication
F. Neurotransmitters
    1. Overview of the role of the major neurotransmitters in behavior
    2. Role of neurotransmitters in mental health disorders
G. Neurotransmitters and drugs
    1. Overview of the basic principles of drug action
    2. Role of the reward circuits in substance abuse
    3. Neural adaptations to drugs
    4. Dependence and addiction
H. The endocrine system and hormones
    1. Overview of the endocrine system
    2. role of hormones in behavior
I. Sensation and movement
    1. Organization of the motor system
    2. Control of muscles
    3. Organization of sensory systems
J. Regulation of internal body states
    1. Overview of homeostatic processes
    2. Role of the hypothalamus
K. Cognition
    1. Overview of the biopsychology of cognitive processes; such as, memory, problem solving, language and intelligence
    2. Neural basis of consciousness
L. Stress, emotions and motivation
    1. Overview of the biopsychology of emotions, mood and motivation
    2. Chemical, emotional, cognitive, and behavioral effects of stress
    3. Psychosocial stress and mental health disorders
    4. Limbic system and expression of emotions
    5. Prefrontal cortex and emotional behavior
M. Sleep, dreaming and circadian rhythms
    1. Overview of the physiological and behavioral correlates of sleep and dreams
    2. Role of biological rhythms in human behavior
N. Cerebral hemispheres
    1. Overview of the roles of the cerebral hemispheres in behavior
    2. Critical analysis of lateralization of function
O. The sexual brain
    1. Critical analysis of the biopsychology of gender differences and sexual orientation
    2. Biopsychology of sexual behavior
    3. Role of hormones in sexual development
P. Personality
    1. Critical analysis and discussion of the biopsychology of individual differences
    2. Critical analysis of the roles of nature and nurture in personality development
Q. The malfunctioning brain
    1. Overview of the biopsychology of mental health problems; such as, anxiety and mood disorders and schizophrenia
    2. Brief overview of neuropsychological diseases and disorders; such as, autism, epilepsy, Parkinson's Disease, and Alzheimer's Disease
    3. Brief overview of the effects of strokes and brain injuries; such as aphasia, agnosia, and neglect syndrome
R. The biopsychology of development
    1. Overview of prenatal brain development
        a. Critical periods and teratogens in prenatal brain development
    2. Overview of postnatal brain development
        a. Brain/behavior changes across the life span, and how these changes relate to cognitive, emotional, and behavioral changes
        b. Role of environment in brain development
S. Learning
    1. Overview of the biopsychology of learning
        a. Basic biopsychological processes involved in learning
        b. Role of emotions in learning
        c. Variations in learning styles
    2. Overview of the disorders of learning
        a. Major learning disabilities; such as, dyslexia and attention deficit disorder, and nonverbal learning disabilities
        b. Psychosocial effects of learning disabilities
T. Aging and the healthy brain
    1. Overview of brain and behavioral changes associated with late life. A discussion of normal brain changes, and brain disorders associated with aging
    2. Health practices related to maintaining brain function

VI. METHODS OF INSTRUCTION:
A. **Lecture** - Lecture on major themes and concepts
B. Readings from texts, supplementary materials, primary source materials
C. **Discussion** - Discussion and problem solving of significant or controversial issues
D. Application of concepts to personal experiences
E. **Audio-visual Activity** - Utilization of video and/or CD-ROM excerpts
F. **Student Presentations** -
G. **Demonstration** - Demonstrations and simulations
H. **Written exercises and case studies** - Written assignments

VII. TYPICAL ASSIGNMENTS:

A. Lecture

1. "The role of stress in the development of depression."

2. “The hierarchical control of movement.”

B. Reading

1. "Brain Structure and Functional Organization of the Brain," Chapter 2, Kolb and Whishaw, pp. 37-72.

2. "The Individual Brain: Personality," Chapter 12, Jones, pp. 203-221

C. Class discussion of significant issues and topics

1. How do biological rhythms influence your behavior?

2. What behavior and health practices are correlated with healthy brain function?

D. Collaborative Learning

1. As a small group project, evaluate the accuracy of information presented in Wikipedia concerning a biopsychology issue by examining other specific primary information sources.

2. Working in a small group, visit several websites related to brain development issues. Prepare a PowerPoint presentation that highlights the effect of environment on brain development.

E. Writing projects

1. Research and write a term paper on the biopsychology of a specific mental health problem (e.g., depression), neurological disease (e.g., Alzheimer's Disease), or learning disability (e.g., dyslexia).

2. Critically evaluate the issues presented in "Nature, Nurture, Brains, and Behavior," Chapter 5 in Psychology Annual Editions, and write a reaction to this topic.

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Research Projects
4. Papers
5. Oral Presentation
6. Projects
7. Group Projects
8. Class Participation
9. Final Performance
10. Other:
    a. Participation in class discussions or small group projects
    b. Research or opinion papers
    c. Chapter quizzes and/or midterm examinations
    d. Final examination
    e. Course project or presentation

B. **Frequency**

1. Minimum of two midterm examinations or chapter quizzes
2. Minimum of one research paper and/or other short essays
3. Multiple reaction/opinion papers
4. Final examination, course presentation or project

IX. TYPICAL TEXTS:

1. Kalat, J (2012). *Biological Psychology* (11th ed.). Stamford: Cengage Learning.
2. Jones, E (2011). *Brain, Mind and Behavior: An Introduction to Biopsychology* (4th ed.). Stamford: Cengage Learning Custom Publishing.
3. Pinel, J (2011). *Biopsychology* (8th ed.). Boston: Pearson.
4. Garrett, B (2010). *Brain and Behavior: An Introduction to Biological Psychology* (3rd ed.). Thousand Oaks, CA: Sage Publications.

X. OTHER MATERIALS REQUIRED OF STUDENTS: