

Neurophysiology and its' Role in Body Systems Management

Instructor: John D. Griffin, Associate Professor of Biology and Director of Neuroscience

This four day intensive course will explore the basic concepts related to the activity of the nervous system and the role it plays in coordinating the activity of other body systems. Course materials will include the use of interactive software, web resources, and a computer-based physiologic recording system. Hypothesis driven exercises related to sensory perception, cardiovascular and respiratory control, as well as biofeedback and autonomic function will be performed. Included in these exercises will be instruction on simple methods of data analysis and presentation.

Monday: Sensation & Perception

I. Introduction

A. My Qualifications

1. Education
2. Position
3. Research
4. Teaching

B. Each Other

II. Administration

A. Food

B. Parking

1. Passes
2. Listing

C. Course Forms

III. Classroom Resources

A. Basics & Safety

B. Computers

C. Presentation System

D. iWorx

IV. Course Resources

A. CD-ROM

1. Course Outline
2. Website Links
3. Lab Exercises
 - a. iWorx
 - b. Frontiers in Physiology
4. Brain Facts

B. Book: The Great Brain Debate, Nature vs. Nurture (John E. Dowling)

V. Brain Facts

- A. Brain Structure & Costs (pg. 3)
- B. The Neuron (pg. 4)
- C. Brain Development (pg. 8)
- D. Sensation & Perception (pg. 12)
 1. Vision
 2. Hearing
 3. Taste & Smell
 4. Pain (Temperature) & Touch
 5. Homeostasis & Sensation
 - a. Internal Pain & Temperature
 - b. Proprioception
 - c. Pressure
 6. Reflexes

VI. iWorx

- A. Tutorial
- B. Stretch Receptors & Reflexes
- C. Auditory & Visual Reflexes
- D. The Diving Reflexes

VII. Frontiers in Physiology

- A. Animals in Research
- B. Response to Stimuli
 1. Lack of Materials
 2. Animals & Perception
- C. Physiology of Taste (Sensation)
- D. Miss Jones (Research Method & Homeostasis)

VIII. Reading for Tuesday: pages 1-4; 25-29

Tuesday: The Brain

I. Book Discussion

II. Anatomy

- A. Human Anatomy (Joe)
- B. Brain Anatomy (Sylvius)
 - 1. Basics
 - 2. Specific Structures (Hypothalamus)

III. Brain Facts

- A. Learning & Memory (pg. 18)
- B. Movement (pg. 20)
- C. Sleep & the EEG (pg 22)
 - 1. EEG Patterning (Class Notes)
 - 2. Sleep

IV. iWorx – The EEG

V. Frontiers in Physiology

- A. You Snooze, You Lose (sleep)
- B. It Takes a Lot of Nerve (Memory)

VI. Reading for Wednesday: pages 57-66

Wednesday: Body Systems Regulation

I. Book Discussion

II. Heart Activity (ADAM Interactive)

- A. Anatomy (form follows function)
- B. The ECG
- C. Cardiac Regulation

III. iWorx

- A. The ECG & Heart Sounds
- B. The ECG & Exercise

IV. Frontiers in Physiology

- A. Heart Rate & Function
- B. Blood Pressure & Heart Rate
- C. Heart Rate

V. Reading for Thursday: pages 83-95

Thursday: Homeostasis & Stress

I. Book Discussion

II. Brain Facts – Stress (pg. 25)

A. Clinical Symptoms

B. Physiologic Responses

III. iWorx

A. GSR & Embarrassment

B. GSR & The Polygraph

IV. Wrap - Up