

# Introduction to Psychobiology

## University of Toledo

### Syllabus

#### Course Information

Course title: **Psychobiology**

Course number: PSY 2600-901

Course discipline: Psychology

Course description: This course provides a basic introduction to psychobiology. It uses a textbook designed for college sophomores. Students take practice quizzes on each of the 20 chapters. Grades are based on 7 exams and 20 "Hear & Spell" tests. Students are allowed to retake one exam at the end of the term.

Prerequisite(s): Recommended, PSY 1010 Introductory Psychology

#### Course Goals

Course goals: The purpose of this course is give you a basic understanding of the neurological basis of behavior so that you can 1) better understand magazine and newspaper articles about the brain, 2) be prepared for advanced courses in neuroscience, and 3) have some knowledge of the neurological disorders that you may encounter during your lifetime.

#### Instructor Information

Name: Henry E. Heffner, Ph.D.

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Biography: B.A., Trinity College CT, Psychology; M.S., Florida State University, Psychology; Ph.D., Florida State University, Psychobiology;

Field of Interest: Role of auditory cortex; Comparative study of hearing; Tinnitus; Ethics of animals research

For more about me go to: <http://psychology.utoledo.edu/showpage.asp?name=hheffner>

#### Textbook

Required reading: ***A Concise Guide to Psychobiology.*** (Available only from the UT bookstore.)

#### Policies

Additional information: Attendance consists of taking quizzes and exams on time. The Instructor may post comments from students (without the students' names) for general enlightenment. These policies and procedures will be followed as closely as possible, but are subject to change.

#### Course Requirements

Requirements: Your grade for the course is based on seven exams, each covering two-three chapters. You will be allowed to retake one exam at the end of the course. **The grade you receive on the retake will be the final grade for that exam, even if it is lower than your first score.** (Note that the retake is optional and that you have to let me know which exam you want to retake.)

The grading scale is:

90% & above = A,

88-89.99% = A-,

86-87.99% = B+,

80-85.99% = B,

78-79.99% = B-,

76-77.99% = C+,

70-75.99% = C,

68-69.99% = C-,

66-67.99% = D+,

60-65.99% = D,

58-59.99% = D-,

below 58% = F.

#### IMPORTANT STUDY TIP

Read a chapter first without filling in the answers to the questions. Read it a second time and fill in the answers as you go. (You can check your answers with those in the back of the book)

Then take a practice quiz for the chapter until you can answer all the questions. Keep reading and taking practice quizzes until you can consistently receive a grade you like. **It is not unusual for "A" students to take each quiz 20 or more times before taking an exam.**

**If you can't answer the practice quiz questions, you will probably not be able to answer the exam questions.**

## Quizzes

**Chapter Quizzes are provided for practice and do not count towards your grade.** You should take a quiz as many times as necessary to achieve mastery. The questions are chosen randomly from the test bank so you will get a different quiz each time.

The quizzes are machine-scored so spelling errors are counted as wrong answers. Also, there may be an alternative correct answer that is not listed. **Do not panic if the computer scores an answer on a quiz wrong when it is really correct.** Students are expected to answer the questions on the quizzes.

Please let me know if you feel a question needs fixing because it is unclear, there is another alternative answer, or the question is just plain wrong--errors do sometimes occur.

## Exams

**The exam schedule is in the Calendar.**

Each exam will have 20-32 questions.

**Academic Honesty.** You **may not** receive help from anyone while taking an exam. Students are expected to adhere to the University of Toledo's policy on honesty, which can be found at: <http://www.utoledo.edu/dl/students/dishonesty.html>

**Scoring Exams.** The exam questions will be matching or multiple choice, with each question based on a practice question.

Note that you will have anatomy questions from previous exams appearing on subsequent ones.

## Hear & Spell Tests

In order to be considered educated, you must pronounce and spell names and technical terms correctly. For this reason many pronunciations are included in the textbook.

Each chapter has an online "Hear & Spell" test in which words that students may not have heard before are given, along with a brief description of the word.

Students are then required to type in the word, spelling it correctly. Books and notes may be used during the Hear & Spell tests and there is no time limit (other than submitting the test before the due date).

Each correctly spelled word on a Hear & Spell test is worth 0.05 points. Because there are about 400 words, this adds up to 20 points, which is about 10% of your total grade.

## Missed Exam Policy

Contact the Instructor as soon as possible.

## Final Exam

Instead of a Final Exam, you are allowed to retake one exam of your choice. Your score on the retake will be your final grade for that exam, even if it is lower than your first score. However, if you are satisfied with your final grade, or do not wish to take the chance of getting a lower score on the retake, you do not have to take it. If you want a retake, you will need to inform the instructor before the last week of the term.

# A Concise Guide to Psychobiology: Table of Contents

## Chapter 1

### **Introduction to Neuroscience**

- Introduction
- What is Neuroscience?
- History of Neuroscience
- Who are Neuroscientists

## Chapter 2

### **Brief Introduction to Neuroanatomy**

- Introduction to the Nervous System
- Commissures
- Fissures and Gyri
- Planes of Orientation
- Brain Scans

## Chapter 3

### **The Neuron**

- Introduction
- Neural Processing
- Electrical Properties of Neurons
- The Synapse
- Electroencephalogram

## Chapter 4

### **Neurotransmitters**

- Introduction
- “Typical” Neurotransmitters
- “Atypical” Neurotransmitters
- Synaptic Transmission
- Receptors, Second Messengers, and Glia
- Readings of Interest

## Chapter 5

### **Non-Neural Elements of the Nervous System**

- Introduction
- Glia
- The Vascular System
- The Meninges
- The Ventricles and Cerebrospinal Fluid
- Neuroanatomy Review

## Chapter 6

### **Development of the Nervous System**

- Introduction
- Prenatal Development
- Genes
- Postnatal Development

## Chapter 7

### **Sensation & Perception + Vision**

#### **Part I**

- Sensation & Perception
- Vision Part I
- Physics of Light
- The Eye
- Refractive Errors: Problems in Focusing the Eye
- Two Common Non-Refractive Problems of the Eye

## Chapter 8

### **The Neural Processing of Visual Information**

- Introduction
- The Retina
- The Visual Pathways
- Visual Cortex
- Disorders of the Visual System
- Subdividing Cortex

## Chapter 9

### **Color Vision, Visual Phenomena, and Early**

#### **Visual Experience**

- Introduction
- Color Vision
- Abnormal Color Vision
- Visual Phenomena
- Acquiring Sight in Adulthood

## Chapter 10

### **Auditory and Vestibular Systems**

- Introduction
- Physics of Sound
- Anatomy of the Human Ear
- Encoding Sound
- The Auditory Pathway
- Physiology of the Auditory system
- Hearing Disorders
- Vestibular System

## Chapter 11

### **Chemical Senses: Taste, Olfaction, and the Vomeronasal Organ**

- Introduction
- Taste (Gustation)
- Olfaction (Sense of Smell)
- Vomeronasal Organ
- Cranial Nerves

## Chapter 12

### **Somatosensory System**

- Introduction
- Discriminative Touch
- Thermal Sensitivity
- Pain (Nociception)
- Kinesthesia
- Somatosensory System Anatomy
- Vibrissae Sense

## Chapter 13

### **Control of Movement**

- Introduction
- Muscles and Motor Nerves
- Spinal Reflexes
- Control of Movement by the Brain

## Chapter 14

### **Regulating the Internal Environment**

- Introduction
- The Autonomic Nervous System
- Neural Regulation of the Autonomic Nervous System
- Eating and Appetite

## Chapter 15

### **Biological Rhythms Including Sleep**

- Introduction
- Biological Rhythms
- Neural Control of Biological Rhythms
- Sleep
- Sleep Disorders

## Chapter 16

### **Emotion and Stress**

- Introduction
- The Study of Emotion
- Central Nervous System Circuits
- Prefrontal Cortex
- Aggression
- Reward Centers in the Brain
- Stress

## Chapter 17

### **Brain Mechanisms in Learning**

- Introduction
- Habituation and Sensitization
- Classical Conditioning
- Operant Conditioning
- The Medial Temporal Lobe and Memory
- Other Human Memory Disorders
- Long-Term Potentiation

## Chapter 18

### **Language and Consciousness**

- Introduction
- Animal Communication
- Cortical Speech Areas
- Lateralization of the Speech Areas
- The Split-Brain
- Consciousness

## Chapter 19

### **The Malfunctioning Mind**

- Introduction
- Psychiatric Conditions with Known Organic Causes
- Schizophrenia
- Environmental Considerations in Mental Illness

## Chapter 20

### **The Symbiotic Nature of Animal Research**

- Introduction
- Symbiosis
- Domestication
- How Humans Benefit from Their Mutualistic Relationship with Animals
- How Animals Benefit from Their Mutualistic Relationship with Humans
- Philosophical Issues