National Taiwan University of Science and Technology

2021 Winter Program

BCSC 110 Neural Foundations of Behavior

Course Outline

Course Code: BCSC 110

Instructor: Todd A. Wells, Ph.D.

Home Institution: University of Denver

Office Hours: TBA & By Appointment

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Credit: 4

Course Description: The course provides an introduction to the brain, its structure and organization, and how it controls everything we do—our perceptions, actions, thoughts, and emotions.

Lecture: The format of class meetings will be a combination of traditional lecture format, problem solving/ group activities, group discussions, and laboratory exercises. I will summarize new material and present illustrations and examples. In lecture, I WILL NOT identify and describe every detail you will read in the text and any supplemental materials. I will, however, emphasize the important topics covered in the reading. You should stop me at any time if you have questions about the material being covered.

Reading: You are expected to complete the assigned reading prior to the class lecture. After lecture, you should reread the assigned text. I recommend that you understand the material and how to solve the sample problems before proceeding to the next section. At the end of each chapter, a summary of important equations and terms is provided that should prove helpful in the preparation for exams.

Course Learning Outcomes:

1. Understand the cellular makeup of the brain and communication within the nervous system
2. Learn about how the brain processes sensory information (perceives the environment) and

controls movement.
3. Understand neural control of species-survival behaviors including sleep, hunger, thirst, reproduction and learning and memory.
4. Explore the aspects of decision making, emotion and neuropsychological disorders.Understanding of principles of evolution and phylogeny.

Required Textbooks: Pinel and Barnes, Biopsychology, 10th edition

Homework: Each lecture has a group of homework problems assigned to it. The problems are chosen to prepare you for the hour exams. If you understand and can do all the homework, you probably will do well on the exams. To get the most benefit from homework, you should **do the assignments on schedule**. It is important to keep up with these assignments!

In-class Activities: In-class activities will allow you to apply your knowledge. These activities may be more challenging than the assigned homework. You will work in small groups to complete these activities. The in-class activities will be graded.

Exams: There are two hour exams during the course, plus a cumulative final exam. Each exam counts 200 points. Exam problems will be similar to the problems assigned as homework and the problems worked in class.

Grading & Evaluation: Your final grade is based on a maximum of 650 points, distributed as follows:

Hour exams (200 points each)	**200 points**
Final exam	**200 points**
Homework	**100 points**
Lab	**400 points**

Grading Ranges:

A+:4.3——95-100

A :4.0——87-94

A-:3.7——82-86

B+:3.3——78-81

B :3.0——75-77

B -:2.7——71-74

C+:2.3——68-70

C :2.0——65-67

C -:1.7——61-64

D :1.0——55-60

E :0.0——49-54

X :0.0——0

Course Schedule:

Week 1 (videos 1-5)

1. Introduction, Cells of the Nervous System
2. Cellular Structure and Function
3. Nervous System Development and Organization
4. Structures of the Brain
5. Neural Conduction

Week 2 (videos 6-10)

6. Synaptic Transmission
7. Visual System: Peripheral and Central
8. Auditory System
9. Somatosensory System
10. Chemical Senses

Week 3 (videos 11-15)

11. Sensorimotor System: Cortex and Sub-cortical
12. Sleep and Dreaming
13. Thermoregulation and Water Balance
14. Hunger and Satiety
15. Hormones and Sex

Week 4 (videos 16-20)

16. Language and Speech
17. Learning and Memory
18. Intelligence, Personality and Morality
19. Reward, Addiction, Emotion and Stress
20. Psychiatric Disorders, Brain Damage and Neuroplasticity