

Principles of Neuroscience I: Neural Development

COURSE NUMBER GMS6021

CREDIT HOURS 2 credit hours

COURSE DESCRIPTION

Principles of Neuroscience I – Developmental Neuroscience (GMS6021)

This course is organized into ten modules, each of which covers a key area of Developmental Neuroscience. Each module includes reading assignments, VT lectures, self-check quizzes, and module tests. Our goal is to help you to obtain a working knowledge of the field of Developmental Neuroscience that will allow you to appreciate the significance of emerging findings in this field and enable you to pursue more in-depth studies of specific topics in this field.

COURSE GOALS / LEARNING OUTCOMES

Developmental Neuroscience is the science of how the nervous system develops, and forms the basis for understanding nearly all aspects of modern medicine. Questions you will be able to answer at the end of this course include:

- How and where does the nervous system originate?
- How are the cells that constitute the nervous system generated?
- How do progenitor cells know which type of cell to become?
- How do newly born neurons reach their appropriate locations in the brain?
- How do maturing neurons form the correct synaptic connections with other neurons?
- What are the consequences of disrupted brain development?

MODULE TOPICS

Module 1 - The Mature Human Brain

Module 2 – Neural Induction

Module 3 – Neural Patterning

Module 4 – Neurogenesis and gliogenesis

Module 5 - Neural migration

Module 6 - Neural differentiation

Module 7 - Axon growth and pathfinding

Module 8 - Target selection and synaptogenesis

Module 9 - Regulation of neuron survival

Module 10 – Refinement of synaptic connections

COURSE FORMAT

This is a semester long online course. You will be expected to complete one module / week, each of which covers a specific topic within the field of Developmental

Neuroscience. Each module is broken down into 3-7 units in an effort to improve your ability to access and understand the information contained in each module. Each unit contains a reading assignment, a video lecture in VoiceThread format, and a self-check quiz that will allow you to determine how well you have understood the material presented in the unit. Each VoiceThread lecture is ~10-15 min in duration and can easily be viewed slide-by-slide. You will complete the ten modules sequentially, and each module will be considered complete when you have submitted all of the online unit self-check quizzes and the module tests.

The self-check quizzes will constitute 10% of your grade and module tests will constitute 50% of your final grade. The remaining 40% of the final grade will be derived from two VoiceThread projects and peer reviews that you will complete after Module 5 and after Module 10 of the course. You will select the topics for your projects from a listing we provide. We will evaluate the quality and content of your projects, peer reviews, and your responses to reviewer comments using grading rubrics that you will be able to use to guide your work on these assignments.

TARGET AUDIENCE

This semester course has been specifically designed for students enrolled in the UF Biomedical Neuroscience Certificate Program. This course is designed to provide a foundation in Developmental Neurosciences. Graduate students attending UF in programs outside of the IDP Neuroscience Program and interested postgraduate and advanced undergraduate students are encouraged to inquire about registration. A 5-week, equivalent course is offered for students enrolled in the UF IDP Neuroscience Graduate program. Other IDP graduate students are encouraged to inquire about taking this accelerated course.

PREREQUISITES

While not required, students enrolled in this course should have a basic understanding of cell biology and preferably have taken introductory courses to Neuroscience. Advanced undergraduate students may inquire about registration.

COURSE DIRECTORS AND INSTRUCTORS

Sue Semple-Rowland, PhD.
Professor of Neuroscience
Director of the Online Biomedical
Neuroscience Certificate Program

Matt Sarkisian, Ph.D.
Assistant Professor of Neuroscience