

Human Neuroanatomy

Course Details

Course Designator & Number: MADR 3023

Number of Credits: 3

Language of Instruction: English

Contact Hours: 45

Instructor: Andrea Santuy, Ph.D.

Course Description

This course provides a broad introduction to the nervous system with an emphasis on the human nervous system. It will introduce the structure and function of neurons, the main anatomical units of the nervous system, and the main functional systems. We will approach functional systems through an understanding of the anatomical circuitry. We will study the fundamental concepts of neural communication early in the course and re-examine them later in the course relative to specific functional systems. Although the major focus will be the normal nervous system, we will introduce common diseases for each main topic. Students will gain an understanding of the nature of many common neurological diseases, which will provide further insight into how the normal nervous system functions. Through the assigned readings, lectures, and exercises, students are expected to gain an understanding of the neural circuitry and information processing responsible for the diverse range of human behaviors.

Course Objectives

The nervous system integrates most systems of our body, thus an understanding of the nervous system will provide students with a broad perspective on many bodily functions and better understanding of many biological processes that impact daily life such as learning and addiction, as well as neurodegenerative disorders. In addition, this course will teach the scientific method, which has broad application to problem solving not only in research but also in modern life. Students will also gain an appreciation for how scientific research is conducted and how research can change our understanding.

Methodology

The classes are lecture-based, combined with class discussion, assigned reading exercises, and students' presentations. Student participation is strongly encouraged, and fully expected, throughout the course.

Required Reading / Materials

We will use the textbook Brodal, The Central Nervous System, Structure and Function, 4th edition.

In addition to the chapters in the textbook, students will also read a small number of supplemental journal articles and discuss them in class.

Grading

Grading Rubric

Letter Grade	Score or Percentage	Description
A	93–100	Achievement that is outstanding relative to the level necessary to meet course requirements.
A-	90–92	Achievement that is significantly above the level necessary to meet course requirements.
B+	87–89	
B	83–86	
B-	80–82	Achievement that meets the course requirements in every respect.
C+	77–79	
C	73–76	
C-	70–72	Achievement that is worthy of credit even though it fails to fully meet the course requirements.
D+	67–69	
D	60–66	
F	0–59	Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.

Summary of How Grades Are Weighted

Assignments	Percentage of Grade
Participation in class	25%
Cultural activities	25%
Quizzes	25%
Final oral exam	25%
Overall grade	100%

Assessment Details

Exams

There will be two exams: a midterm and a final. Exams will consist of multiple choice, true/false, and short answer questions. Questions will be based on material covered in class and readings. Exam questions are designed to test students' understanding of basic terminology and concepts, and their ability to apply these concepts.

Slide show presentation and questions

Students will work to prepare a slide show in PowerPoint and present it to the rest of the class. The slide show will summarize a scientific paper in the field of neuroanatomy. Each student will submit a question about each of the selected papers prior to class.

Course Content

Note: Schedule is subject to change depending on how quickly we progress through the material.

Unit 1

Theme

- Course introduction/Overview of the nervous system/Development

Unit 2

Theme

- Ventricles, CSF and meninges/Blood supply/Cell types

Unit 3

Theme

- Electrical properties of neurons/Synaptic communication

Unit 4

Theme

- Spinal cord/Brainstem/Cranial nerves

Unit 5

Theme

- Forebrain/Somatosensory system

Unit 6

Theme

- MIDTERM EXAM

Unit 7

Theme

- Hearing and balance/Chemical senses

Unit 8

Theme

- Overview of motor systems/Basal ganglia/Cerebellum

Unit 9

Theme

- Eye movements/Autonomic nervous system

Unit 10

Theme

- Reticular formation and sleep/Hypothalamus

Unit 11

Theme

- Limbic system/Cerebral cortex

Unit 12

Theme

- Language and the brain/Learning and memory

Unit 13

Theme

- Walking/Injury and regeneration/Adult neurogenesis and stem cells

Unit 14

Theme

- Final Exam

Policies

Attendance Policy

Regular attendance and punctuality are expected in order to earn full marks. Nevertheless, students are allowed ONE UNJUSTIFIED absence. From that one on, each absence will decrease the final grade. Instructor may deny the access to the classroom if the student arrives more than 10 minutes after the class has started. In the case of absences, it is the student's responsibility to find out what information was given in class including any announcements made.

CELL PHONE & LAPTOP POLICY

No cellular phones may be connected during classes or any other program activities. There will be no laptops (or tablets) in use in class. There is clear research evidence showing that student learning is impeded, not helped, by taking notes on a laptop in class. Furthermore, students using laptops also impair the performance of other students in class. Instead, take notes on paper in class. Exceptions may be made in the case of certain documented disabilities.

STUDENTS WITH DISABILITIES

Students in need of assistance have to fill a form at their home university in order to help us make the Foundation's facilities suitable to their needs. In the first class, students must inform the instructor in order to make appropriate arrangements.

DISCLAIMER

The class schedule and required material is subject to change. Most of the classes will take place at the Foundation OrtegaMarañón but some of them may take place in other locations that are scattered within Madrid's metropolitan area and some of them in nearby Toledo. Thus, the students must use the public transportation to get there. The FOGM staff will provide students with detailed information about the public transportation and if necessary accompany them to these locations.

University of Minnesota Policies & Procedures

Academic integrity is essential to a positive teaching and learning environment. All students enrolled in University courses are expected to complete coursework responsibilities with fairness and honesty. Failure to do so by seeking unfair advantage over others or misrepresenting someone else's work as your own can result in disciplinary action. The University Student Conduct Code defines scholastic dishonesty as follows:

Scholastic Dishonesty

Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis.

Within this course, a student responsible for scholastic dishonesty can be assigned a penalty up to and including an “F” or “N” for the course. If you have any questions regarding the expectations for a specific assignment or exam, ask.

Student Conduct

The University of Minnesota has specific policies concerning student conduct. This information can be found [on the Learning Abroad Center website](#).