Course Syllabus

Course Information

Course Number/Section	NSC 4354.002
Course Title	Integrative Neuroscience
Term	Spring 2025
Days/Times/Room	MW 08:30am-09:45am GR4.428

Professor Contact Information

Professor	Dr. Siham Raboune
Email Address	siham.raboune@Utdallas.edu
Office Location	JO3.110
Office Hours	T 10:15am-11:15am
Other Information	Course Web Site: UTD eLearning

2.706

Course Pre-requisites, Co-requisites, and/or Other Restrictions

NSC 3361 or equivalent

Course Description

Course Examines the collective behavior of neuronal systems with respect to motor control, sensory processing, and regulation of more advanced behavioral, motivational, and cognitive functions.

Student Learning Objectives:

After completing the course, students should be able to:

1.1 Describe the historical development of neuroscience as a cross-disciplinary science.

1.2 Describe and analyze the contributions of anatomical, physiological, behavioral, pharmacological, developmental, and cell and molecular biological studies to the bases of neuroscience, and: a) describe the principles of (1) feedback, (2) reciprocal connectivity, and (3) distributed processing fundamental to self-organizing neural systems, b) describe neural mechanisms of (1) motor control, (2) sensory processing, (3) homeostatic maintenance, and (4) higher cognitive functions (including learning, memory and emotions), c) describe the anatomical and functional organization of the autonomic nervous system and neuroendocrine systems.

2.1 Identify and explain why research questions rather than methods ideally drive advances in neuroscience, and: a) describe and analyze common behavioral methods used to interpret neuronal function in current studies, and limits of these techniques, b) describe and analyze use of different lesions (natural, accidental and induced) in nervous systems to infer function, & limits of these techniques, c) describe and analyze non-invasive imaging techniques used to assess nervous system structure and function, and the temporal and spatial limits of these techniques compared to other available methodology.

2.2 Describe how current methods sometimes limit our understanding of the nervous system, and drive innovation to develop new and better methods.

2.3 Describe why multiple research techniques & multiple levels of analysis (systems, network, cellular, synaptic, etc.) are preferred to address basic questions in the neurosciences, not reliance on a single technique or level.

3.1 Students will be able to describe basic components of the laws of nature as developed in the various scientific courses in the core program.

3.2 Students will be able to set up scientific problems in feasible and solvable ways as illustrated in the various subjects in the core curriculum.

3.3 Students will be able to make reasoned arguments about major issues of a scientific nature.

A course in the neurosciences takes aim at a constantly moving target. This course covers three core areas of neuroscience: (1) cellular properties of different types of neurons that suit them to (and/or limit) the specific tasks they carry out; (2) organization of functional neural systems that determine the behavioral and cognitive properties of living organisms; (3) critical evaluation of the research methods used to assess (1) and (2). The aim is to familiarize you with systems analyses of brain function, which must take into account all known neurobiological and psychological data. Since no current framework fully meets these comprehensive goals, you will be trained to critically evaluate current and future theories that purport to do so. Class discussion is strongly encouraged

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Required Textbooks and Materials

Required: D. Purves et al., (eds) Neuroscience 6th edition (2017) ISBN-10: 1605353809. The 5th edition is acceptable as well.

Also **recommended:** E.R. Kandel, J.H. Schwartz, and T.M. Jessell (eds) Principles of Neural Science 5 th ed. (2012) ISBN10: 9780071390118.

Course & Instructor Policies

eLearning, course information, and UTD email

All course information including PowerPoints will be posted on eLearning. No portion of classroom material including all PowerPoint slides may duplicated, reposted, retransmitted, sold, or otherwise used without the express written approval of the author. I will use e-Learning to post announcements from time to time as well as any urgent changes to our class schedule including class cancellations should the need arise. To comply with FERPA regulations, all and any email correspondence related to the course MUST be sent through official UTD email/eLearning; I will not respond to emails sent via any outside email addresses. This is to protect your privacy. Grades will be posted as soon as they are available. Announcements may be made from time to time in class or via e-learning announcements.

Attendance and Readings

Learning about neuroscience can be a challenge even for the most studious student. Regular attendance and reading are vital to your understanding of the subject. Your performance in this course will probably be affected by your attendance. Attendance of classes is strongly recommended, as tests will be based on material taken from the classes and will not be restricted to the topics and textbooks indicated in this syllabus, which serves predominantly as a guideline to the course. Arrive on time and please give your entire attention to the class until dismissal. It is your responsibility to come to class or otherwise obtain information presented in class from another class member. The instructor will post lecture slides prior to class. Students are expected to read lecture material before coming to class. Students are also expected to participate in class discussions and activities. **I will often emphasize particular parts of a chapter that I think are critical for your future studies. If you are not in class, you will not know what parts I have emphasized!** In addition, I may from time to time present material in lecture that

is not covered in the textbook. This will often include material designed to enhance your knowledge and peak your interest. This should encourage you to attend class and to keep up on your reading assignments.

Special needs
Any student with special needs/circumstances that require special accommodations for this course should make this known to the instructor during the first week of class via email.

Academic Support/Tutoring
The Student Success Center offers Supplemental Instruction (SI) for this course free of charge. Study sessions are lead by an SI leader, someone who has taken the class and done well, and are held weekly. Sessions start during the second week of classes and are voluntary; there is no need to sign up. For details such as days and times and other additional information check http://www.utdallas.edu/studentsuccess/leaders/si.html

Your class TA is a good source of information and can be very helpful if you are having trouble in the class with regard to understanding the material. Teaching Assistants (TA) are graduate students with a good degree of knowledge about the material you are being given; many of them have taken this class. Please feel free to email your TA at any time during the semester His or her contact information is listed above.

Grading Policy

Your grade will be determined as follow:

In Class Exams:	85%
Take Home Assignments:	15%
Total earned	**100%**

Letter grades will be assigned according to the following cutoffs:

The plus/minus grading system is used in this course. A+ (97–100), A (94<97), A- (90<94), B+ (87<90), B (84<87), B- (80<84), C+ (77<80), C (74<77), C- (70<74), D+ (67<70), D (64<67), D- (60<64), F (< 60).

Exams (85%): There will be four exams. All will consist of multiple-choice, matching, and true/false questions and will be graded equally. The final exam is cumulative. You may drop your lowest grade even the final if desired. Exams will begin promptly Exams will begin promptly, and no one will be allowed to take the exam once the first person done has left the room and no extra time will be given. Make-up exams are rarely offered and only at my discretion. Excused absences for exams will be given only if: (a) you are seriously ill and have verifiable documentation from a physician, or (b) you made prior arrangements to attend a verifiable religious or family event. In all of these cases, you must notify and discuss with the instructor in advance of the scheduled exam by email. A maximum extension of one week (7 days) beyond the scheduled exam date can be granted for a make-up exam.

Reviewing Past Exams: Students have a week from the day exam grades are posted in which to make an appointment to review that particular exam.

Take Home Assignments (15%): There will be a total of three essays during the semester. Each essay is worth (5%). This is a going to be a "small group" work, so collaboration is allowed, however, every student needs to write their own assay independently and include names of all group members. These essays need to be submitted

by the due date via Turnitin. ***The due dates of submission and detailed instructions for these essays will be announced in class and via e-learning***. ***There is No make up for these assays***

Scholarly Student Conduct

In order to create an environment that is conducive to learning, students assume the duty to conduct themselves in a manner appropriate to the university policy. Please plan to pay your full attention to class and be an active learner. If you have a cell phone in class, be respectful to your classmates and make sure you silence the ringer before class begins. Also restrict its use to course content. Behaviors that are disruptive or insulting to me or your classmates will not be accepted.

Academic Dishonesty

Violations of academic honesty (cheating, plagiarism, etc.) will not be accepted Please refer to your student handbook for a description of academic dishonesty policy.

The instructor reserves the right to amend this syllabus at any time. It is the responsibility of the student to be made aware of any changes in the syllabus by attending class and checking e-learning regularly.