Systems Neuroscience Syllabus – Fall 2024

Course	ACN/HCS/ PSYC-6346.001.24F
Course Title	Systems Neuroscience
Professor	Diana Tavares Ferreira, PhD
Term	Fall 2024
Days and Times	Tuesday & Thursday 10:00 am – 11:15 am
Classroom	FN 2.202

This course syllabus is intended as a set of guidelines for this Systems Neuroscience Course. Both UT Dallas and your Instructor reserve the right to make modifications in content, schedule, and requirements as necessary.

Professor's Contact Information

Office Location	BSB 14.609
Email Address	diana.tavaresferreira@utdallas.edu (preferred method of contact; please use your UTD email)
Office Hours	Thursdays from 11:30 - 12:30 pm. By appointment, send appointment request via e-mail.

General Course Information

Pre-requisite: Admission to the Cognition & Neuroscience doctoral/ACN master's program, or permission of the Instructor.
Instructional Mode: In person class format. Any change of plans will be communicated via e-mail/eLearning.
Expectations: Students are expected to complete all the exams and assignments on time. Refer to the syllabus for due dates.
Course Description: Examines the collective behavior of neuronal systems with respect to sensory processing, motor control and regulation of more advanced (homeostatic/cognitive) functions.
Student Learning Objectives: This course covers three core areas of neuroscience: (1) organization of functional neural systems that determine the behavioral and cognitive properties of living organisms; (2) critical evaluation of the research methods used to assess sensory, motor, and cognitive/associative systems and (3) to familiarize you with systems analyses of brain function. After completing the course, students should be able to:

1) Understand why neuroscience is a cross-disciplinary science and the contribution of systems neuroscience to our understanding of brain and behavior.
2) Describe and analyze the contributions of anatomical, physiological, behavioral, pharmacological, developmental, and cell and molecular biological studies to the bases of neuroscience and describe basic functional organization and neural mechanisms contributing to (1) sensory processing, (2) motor functions, (3) , and (4) higher cognitive functions.
3) Identify and explain why research questions rather than methods ideally drive advances in neuroscience, and: (a) describe and analyze common 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.
4) Describe how current methods sometimes limit our understanding of the nervous system, and drive innovation to develop new and better methods.
5) 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.
6) Develop skills in presenting scientific research concepts/topics related to the systems covered in class orally to an audience of your peers.

Required Textbooks and Materials
Required: D. Purves et al., (eds) Neuroscience 6th edition (2017) ISBN-10: 1605353809. This is the edition referenced in the Syllabus (Chapters) below. The 5th edition is acceptable as well.
Recommended: E.R. Kandel, J.H. Schwartz, and T.M. Jessell (eds) Principles of Neural Science 5 th ed. (2012)ISBN10: 9780071390118.
Textbooks and some other bookstore materials can be ordered online or purchased at the UT Dallas Bookstore.
Students are responsible for the textbook material. Not all textbook material will be covered in lectures. Students MUST read the textbook and are responsible for the textbook material unless otherwise notified by the instructor.

Class Materials: The Instructor may provide additional class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course. However, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Recordings: Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. If the instructor or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use unless an exception is allowed by law. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Class Policies: PLEASE DON'T BE LATE! Lectures and/or discussion begins promptly, and lateness is rude to your Instructor and fellow students. Excused absences for exams will be given only if: (a) you are seriously ill and have verifiable documentation from a physician, or (b) you were detained by law at the exam time, or (c) you made prior arrangements to attend a verified religious or family event. In ALL these cases except (b), you must notify the instructor in advance of the scheduled exam by email; for (b), your court order will suffice. Otherwise, you will receive a zero (0) for that evaluation. All oral presentations are due on the dates discussed in class, unless pre-approved by the Instructor.

Communication

This course utilizes online tools for interaction and communication. Some external communication tools such as regular email and a web conferencing tool may also be used during the semester should the need arise. For more details, please visit the Student eLearning Tutorials webpage for video demonstrations on eLearning tools. Student emails and discussion board messages will be answered within 3 business (working) days under normal circumstances.

Grading Policy and Final Grade Scale

GRADING SCALE:
Percent Grade Point Range Totals
90.0-100% A
80.0-89.99% B
70.0-79.99% C
60.0- and less F

Grade distribution: *Course grades will be calculated based on the following*

Categories	Weighted grades (%)	Due dates
Attendance and participation	20 %	Refer to course schedule
Exams	50 %	Refer to course schedule
Oral presentation	30%	Refer to course Schedule

Class Attendance and Participation: Regular class attendance and participation is expected. *You should attend every class, but extenuating circumstances arise that can make this difficult. If you cannot attend a class, please let me know. If circumstances make you miss more than 3 classes during the semester, you may be overextended. I ask that you to come see me to discuss your options. I expect everyone to participate in class so that we can all benefit from the insights and experiences that each person brings. Students who fail to participate in class regularly are inviting scholastic difficulty. Successful participation is defined as participating in the class discussion and also consistently adhering to University policy for in person class attendance. Failure to comply with these University requirements is a violation of the Student Code of Conduct.*

Exams: *There will be 3 exams during the course excluding an optional cumulative final exam. These may include true or false, multiple choice, fill in the blank and short answer type questions. Exams 1 through 3 will cover the material preceding the exam, while the Final comprehensive exam will cover any material presented throughout the course.* ***All exams are closed book exams. The comprehensive final can be taken to make up any missed exam or replace lowest scores of one of the three exam. Excused absences for exams require both appropriate documentation and advance notice (by email, phone, or in person- see Class Policies above). Exam grades will be posted in eLearning. Following exams, you have one week to review your exam for grading errors, after which no changes will be made to any grade.***

Oral presentations: *Any topic taught in the class can be selected (Sensory, Motor,* Changing brain, *Associative/Cognitive). You should clearly show how the course content helped you with the understanding of the topic of your choosing. Examples of topics that can be chosen include: a disorder that impairs sensory, motor, or cognitive/associative functions, differences in the way that a particular circuit/system functions across species, experience-induced plasticity of a particular neural circuit/system, sex differences in the way a neural circuit/system functions, a summary/historical overview of a particular research technique used to probe sensory/motor/associative systems, etc. Instructions and grading rubric will be provided in class.*

Photography and videography is prohibited. *Lecture slides will be posted on eLearning. These slides are for your own use to aid your learning in this course.* ***Reposting of these slides/videos online or reuse of these slides for other purposes is prohibited.***

COVID-19 Guidelines and Resources: *Students who have tested positive for COVID-19 should NOT attend class in person and should instead follow guidelines posted on the University's website https://www.utdallas.edu/community-health/covid-19/students-who-test-positive-for-covid-19/. If this applies to you, let me know PRIOR to the scheduled class/es you will be missing so I don't deduct attendance and participation points from you.*

Lecture Schedule:

Date	Topic	Readings
August 20	Introduction	
August 22	Sensory systems: Touch and proprioception	Chapter 9
August 27	Sensory systems: Pain	Chapter 10
August 29	Sensory systems: Visual system	Chapter 11
September 3	Sensory systems: Central visual pathways	Chapter 12
September 5	Sensory systems: Auditory system	Chapter 13
September 10	Sensory systems: Vestibular system	Chapter 14
September 12	Sensory systems: Chemical senses	Chapter 15
September 17	Review	
September 19	Exam 1	
September 24	Motor systems: Spinal cord and Lower Motor Neurons	Chapter 16
September 26	Motor systems: Upper motor neurons and brainstem	Chapter 17

October 1	Motor systems: Basal ganglia	Chapter 18
October 3	Motor systems: Cerebellum	Chapter 19
October 8	No class	
October 10	Review	
October 15	Exam 2	
October 17	Changing brain: experience dependent plasticity	Chapter 25
October 22	Changing brain: repair and regeneration	*Chapter 26*
October 24	Complex Brain Functions: Attention	Chapter 29
October 29	Complex Brain Functions: Memory	Chapter 30
October 31	Complex Brain Functions: Emotion	Chapter 31
November 5	Complex brain functions: Speech and language	Chapter 33
November 7	Review	
November 12	Exam 3	
November 14	ORAL PRESENTATIONS 1	
November 19	ORAL PRESENTATIONS 2	
November 21	ORAL PRESENTATIONS 3	
November 26	Fall Break	
November 28	Fall Break	
December 3	Optional Review Session for Comprehensive Exam	
December 5	Comprehensive Exam 4 (OPTIONAL): Sensory, motor, changing brain & complex brain functions	

UT Dallas Syllabus Policies and Procedures
The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please go to http://go.utdallas.edu/syllabus-policies for these policies.

Comet Creed
This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same: "*As a Comet, I pledge honesty, integrity, and service in all that I do.*"

Academic Support Resources
The information contained in the following link lists the University's academic support resources for all students. Please go to Academic Support Resources webpage for these policies.