

Functional Human Neuroanatomy 2019 (GMS 6705)

Monday, May 13 – Friday, June 21

Course Description

Functional Human Neuroanatomy is a survey course in functional neuroscience, intended for a diverse group of graduate students. The course is designed to introduce students to broad concepts involving the principles of cellular neuroscience, the gross and microscopic organization of the central nervous system, functional systems, functional deficits following a CNS lesion, and higher cortical functions. The course integrates basic neuroanatomy with systems neuroscience through lectures, wet lab activities, textbook and anatomy atlas, and websites.

Course Director

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Graduate Student Lecturers

Elena Polejaeva – Clinical Health Psychology – polejaeva@ufl.edu

Elle Wiggins – Clinical and Health Psychology – ellewiggins@phhp.ufl.edu

Recommended Textbooks

Purves et al. (2018). *Neuroscience* (6th Edition)

Haines DE (2015). *Neuroanatomy: An Atlas of Structures, Sections, and Systems* (10th Edition)

Nadeau et al. (2004). *Medical Neuroscience*

Learning Objectives and Learning Activities (L=lecture/textbook; B=lab; N=name the lesion case presentations; W=websites)

1. Learn the general histological features of glia and neurons – L, W
2. Understand structural and functional issues of the blood-brain barrier – L, W
3. Learn steps of chemical neurotransmission - L

4. Learn actions and metabolic pathways for chemical neurotransmitters - L
5. Understand the origins of transmembrane potential, subthreshold current flows, action potentials and synaptic potentials - L
6. Describe the processes of neuronal degeneration and regeneration - L
7. Understand the potential role of stem cells in the repair of the nervous system - L
8. Learn gross anatomy of the brain, brainstem and spinal cord – L, B, W
9. Relate developmental features to the adult CNS - B
10. Learn the basics of vascular anatomy of the CNS – L, B
11. Interpret basic brain images – L, B
12. Understand the organization of functional systems – somatosensory, pain pathways, cranial nerve, motor, visual, auditory, vestibular, autonomic, and eye movement systems – L, B
13. Understand higher cortical processes – language, memory, frontal lobe functions, sleep and arousal – L
14. Understand clinical deficits following lesions within the CNS – N

Evaluations/Grading

	Percent of Grade	Testing Method	Date of Exam
Lab Exam 1: Gross anatomy	20	Practical Exam	5/24
Lecture Exam 1: Lecture material 5/13-5/22	15	Computer-based exam	5/24
Lab Exam 2: Anatomy	20	Computer-based exam	6/10
Lecture Exam 2: Lecture material 5/28-6/7	15	Computer-based exam	6/10
Lecture Exam 3: Lecture material 6/11-6/17	15	Computer-based exam	6/18
Lab exam 3: Name the Lesion	15	Computer-based exam	6/19

Grading

Course grades will be determined consistent with current UF grading policies, which can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

Grading Scale:

Percentile	Letter Grade
93.00-100	A
90.00-92.99	A-
86.67-89.99	B+
83.34-86.66	B
80.00-83.33	B-
76.67-79.99	C+
73.34-76.66	C
70.00-73.33	C-
65.00-69.99	D
0.00-64.99	F

Attendance

Attendance is strongly suggested for all lectures, name the lesion sessions, and the lab introductions and is optional for review sessions and evening/weekend labs. Requirements for class attendance and make-up

exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

University of Florida Honor Code

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code”. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Accommodations

The University of Florida is committed to providing academic accommodations for students with disabilities. Students requesting accommodations must first register with the Disability Resource Center (DRC) (352-392-856; <http://www.dso.ufl.edu/drc/>) by providing appropriate documentation. Once registered, students should present their accommodation letter to the College of Medicine’s ADA Representative, Mr. Jim Gorske (jgorske@ufl.edu), who will distribute the accommodation letter to appropriate course and/or clerkship directors, as needed, as well as the testing center. The University encourages students to register with the DRC as soon as they begin graduate school or upon the verification of a disability.

Student Counseling and Resources

The COM Office of Student Counseling and Development (<http://counseling.med.ufl.edu/>) provides information on counseling, self-assessment, wellness, student resources, and student advocacy. Especially helpful are the many student resource links (<http://counseling.med.ufl.edu/com-links/>). U Matter, We Care! If you or a friend is in distress, please contact: umatter@ufl.edu or 352-392-1575. You may also contact the Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc/>.

Course Evaluations

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Daily Schedule

- Each weekday will begin with an introduction to the lab in room CG-68 at 9:00am-10:00am.
 - Material covered in the lab portion will be tested on the three lab exams.
- We will then move into the lab (CG-67) 10:00-12:00.
- After a break from lunch, there will be one or two lectures (1:00-2:00 & 2:00-3:00) in room CG-68.
 - Material covered in the afternoon lectures will be tested on the three lecture exams.
- Suggested reading for the lab and lecture portions is indicated in blue for each day.

Time	Monday May 13	Tuesday May 14	Wednesday May 15	Thursday May 16	Friday May 17
9:00 AM	Course and Lab Logistics Overview <i>Dossat</i> CG-68	Lab Intro 1 Development, Directional terms, Major divisions, & Ventricular system <i>Dossat</i> CG-68	Lab Intro 2: Meninges, White matter, Gray matter, Diencephalon <i>Mandel</i> CG-68		
10:00 AM - 11:00 AM	Lab Tour; Small Group Intro	Lab CG-67	Lab CG-67	Cumulative Lab CG-67	Cumulative Lab CG-67
12:00 PM					
1:00 PM	Neurohistology <i>Reier</i> CG-68	BBB/CSF <i>Reier</i> CG-68	CNS Trauma <i>Reier</i> CG-68		
2:00 PM	PNS Degeneration & Regeneration <i>Reier</i> CG-68	Electrophysiology <i>Burke</i> CG-68	Chemical Neurotransmission <i>Burke</i> CG-68		
3:00 PM					
4:00 PM					
Suggested Reading	Purves Ch. 1	Purves Ch. 2, 5, 6; Nadeau Ch. 1 (Lab)	Purves Ch. 4, 7, 26; Nadeau Ch. 1 (Lab)	Nadeau Ch. 1 & 2 (Lab)	

Time	Monday May 20	Tuesday May 21	Wednesday May 22	Thursday May 23	Friday May 24
9:00 AM	Lab Intro 3: Diencephalon, Brainstem, Cerebellum <i>Selba</i> CG-68	Lab Intro 4: Spinal Cord Overview <i>Dossat</i> CG-68	Lab Intro 5: Cerebrovasculature <i>Dossat</i> CG-68	Orange and Blue Review <i>Dossat</i> CG-67	
10:00 AM - 11:00 AM	Lab (Practice Practical) CG-67	Lab (Practice Practical) CG-67	Lab (Practice Practical) CG-67		Lecture Exam 1: 10:30 AM - 12:00 PM CG-28
12:00 PM					
1:00 PM	Neurodevelopment 1 <i>Sarkisian</i> CG-68	Neurotransmitter Systems 1 <i>Dossat</i> CG-68	Spinal Cord <i>Dossat</i> CG-68	Synaptic Plasticity <i>Hernandez</i> CG-67	
2:00 PM	Neurodevelopment 2 <i>Sarkisian</i> CG-68	Neurotransmitter Systems 2 <i>Dossat</i> CG-68	Optional Review in Lab 2:00-4:00 PM <i>Dossat</i> CG-67	TBD	Lab Exam 1: 2:00 PM - 3:30 PM CG-67
3:00 PM					
4:00 PM					
Suggested Reading	Purves Ch. 2, 4; Nadeau Ch. 1 (Lab)	Purves Ch. 22, 23; Nadeau Ch. 2 (Lab)	Nadeau Ch. 1, 2 (Lab)	Purves Ch. 8, 25; Nadeau Ch. 2 (Lab)	

Time	Monday May 27	Tuesday May 28	Wednesday May 29	Thursday May 30	Friday May 31
9:00 AM	HOLIDAY!	Lab Intro 6: Somatosensory pathways <i>Selba</i> CG-68	Lab Intro 7: Motor tracts <i>Dossat</i> CG-68	Lab Intro 8: Cranial Nerves <i>Dossat</i> CG-68	Lab Intro 9: Cerebellum, Basal Ganglia <i>Dossat</i> CG-68
10:00 AM - 11:00 AM		Lab (Practice Practical) CG-67	Lab (Practice Practical) CG-67	Lab (Practice Practical) CG-67	Lab (Practice Practical) CG-67
12:00 PM					
1:00 PM		Somatosensory systems <i>Dossat</i> CG-68	Motor Systems 1 <i>Dossat</i> CG-68	Cranial Nerves <i>Dossat</i> CG-68	Orange and Blue Review #2 <i>Selba</i> CG-67
2:00 PM		Pain <i>Caudle</i> CG-68	Motor Systems 2 <i>Dossat</i> CG-68	Autonomic Nervous System <i>Johnson</i> CG-68	
3:00 PM		Exam 1 Review (optional) <i>Dossat</i> CG-68			
4:00 PM					
Suggested Reading			Purves Ch. 9, 10	Purves Ch. 16, 17	Purves Appendix, Ch. 20

Time	Monday June 3	Tuesday June 4	Wednesday June 5	Thursday June 6	Friday June 7
9:00 AM	Lab Intro 10: Auditory, Vestibular, Visual <i>Dossat</i> CG-68	Tracts Review: Somatosensory <i>Dossat</i> CG-68	Tracts Review: Motor <i>Dossat</i> CG-68	Tracts Review: CB/BG <i>Dossat</i> CG-68	Tracts Review: Cranial Nerves <i>Dossat</i> CG-68
10:00 AM - 11:00 AM	Lab CG-67	Open Question Session with TAs CG-67	Open Question Session with TAs CG-67	Open Question Session with TAs CG-67	Open Question Session with TAs CG-67
12:00 PM					
1:00 PM	Imaging Anatomy of the CNS <i>Robinson</i> CG-68	Basal Ganglia <i>McFarland</i> CG-68	Auditory System <i>Oh</i> CG-68		
2:00 PM	TBD	Cerebellum <i>McFarland</i> CG-68	Vestibular System <i>Someya</i> CG-68	Optional Review in Lab <i>Dossat</i> CG-67	
3:00 PM					
4:00 PM					
Suggested Reading	Purves Ch. 18, 19	Haines Ch. 8	Haines Ch. 8	Haines Ch. 8	

Time	Monday June 10	Tuesday June 11	Wednesday June 12	Thursday June 13	Friday June 14
9:00 AM	Lecture Exam 2: 9:00 - 10:30 AM <i>Going Old School!</i> CG-67	Name the Lesion Introduction <i>Dossat</i> CG-68			
10:00 AM - 11:00 AM		NTL 1 CG-67	NTL 2 CG-67	NTL 3 CG-67	NTL 4 CG-67
12:00 PM					
1:00 PM		Neurobiology of Addiction <i>Setlow</i> CG-68	Retina <i>Semple-Rowland</i> CG-68	Visual Pathways <i>Semple-Rowland</i> CG-68	Higher Cortical Function <i>Wiggins</i> CG-68
2:00 PM		Frontal Lobes/Executive Function <i>Polejaeva</i> CG-68	Taste and Smell <i>McIntyre</i> CG-68	Emotions <i>Tanner</i> CG-68	Memory Systems <i>Hernandez</i> CG-68
3:00 PM	Lab Exam 2: 3:30 - 5:00 PM CG-28	Exam 2 Review CG-68			
4:00 PM					
Suggested Reading		Purves Ch. 27	Purves Ch. 11, 15	Purves Ch. 12, 20, 30	

Time	Monday June 17	Tuesday June 18	Wednesday June 19	Thursday June 20	Friday June 21
9:00 AM		Lecture Exam 3:			
10:00 AM - 11:00 AM	NTL Review CG-67	9:00 - 10:30 AM CG-28			
12:00 PM			Lab Final (NTL)		
1:00 PM					
2:00 PM			11:30 – 2:30 PM CG-28		
3:00 PM					
4:00 PM					
Suggested Reading					