

SYLLABUS for FUNCTIONAL NEUROANATOMY HONORS PRACTICUM, SPRING 2020

NROSCI 1112 - 1205 (30778), M 1:00-4:00, 180 Crawford Hall

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Course description

This course is devoted to improving your understanding of the functional organization of the human central nervous system using a "hands-on" approach. There is no better way to get familiar with the brain than to hold one in your hands! You will hold many in this course. We will use human brain specimens to investigate the structure of the human brain, with an emphasis on understanding it in three dimensions. Additionally, students will learn how to create 3D computer models of selected brain structures and will have them printed using Pitt's 3D printers (no prior 3D modeling or 3D printing experience necessary -- promise!). Finally, we will learn about brain imaging technologies (e.g. MRI, CT, PET) and how to know what you see in these images, as well as modern neuroanatomical techniques used in both clinical and research settings.

Course materials and communications

Handouts and slide presentations will be available on CourseWeb. Additionally, during the term, I will put names of and links to resources you can use to study the neuroanatomy we cover. In the lab, The Brain Atlas, 2nd Edition (Woolsey et al.; Fitzgerald Science Press), is available. There is no required book or other materials for this course.

CourseWeb will be used to post course announcements. Important announcements may also be sent to your University of Pittsburgh email address. Announcements, information, course changes, and documents posted to CourseWeb are **REQUIRED** content for the course (unless you are told otherwise) **so please check the CourseWeb page often and pay attention to posted announcements.** Note: No course materials may be posted online to outside sites or used by anyone other than students taking this course during this term. Students violating this policy (e.g. posting course materials online) will be reported.

Email: Any official email communications regarding this course will be delivered to students' University of Pittsburgh email address, in accordance with the University of Pittsburgh email communication policy. <http://www.bc.pitt.edu/policies/policy/09/09-10-01.html>. Students who wish to forward their Pitt email to another account do so at their own risk. Please see the University Email Communication Policy in the Academic Policies section near the end of the syllabus.

I endeavor to respond to all emails within 48 business hours. If I have not responded to an email you sent me by then, feel free to email me again. Keep in mind, however, that close to exam dates I may not be able to answer your questions about course material via email, due to the volume of such emails I receive right before exams.

Course content and exam schedule

The course material and exam schedule is on the last page of this syllabus. Please note that the material we cover in each class may vary, depending on the duration of lectures, class discussions, etc. Exams will only include material we have covered prior to the exam date. An updated schedule may be provided, if necessary.

Course Grades

Your course grade will be based on:

Practical exam (35%): This practical exam will utilize the human brain specimens and images taken using the brain imaging modalities we discuss. You will be expected to identify brain structures, answer basic questions about them, and to address issues relating to the functions of regions we discuss in class.

3D printing project (20%): Students will be divided into small groups and each group will use basic 3D modeling software to develop a model of a human brain structure or set of related structures. These models will be designed as a teaching tool you might use to teach a topic in neuroanatomy you find difficult to explain using 2D materials. You will be asked to present your model to the class and explain how you made it and what its significance is as a teaching tool.

Brain injury reconstruction project (30%): During the second half of the course, you will work in groups to reconstruct and analyze brain injuries, either in a specific patient or in a group of patients with similar injuries. You will use the neuroanatomy and imaging material you learned earlier in the course to a) determine what components of the brain(s) were injured in the patient(s), b) show how that affected surrounding or connected brain regions, and c) correlate these findings with symptoms of the injury. Your group will do a presentation to the class showing your findings.

Class participation (15%): This component of your grade will be based on your engagement in the course, in your contributions to group work, and your willingness to ask and answer questions during class.

Grades will be determined based on the following ranges:

A+	97-100%	B+	87-89%	C+	77-79%	D+	67-69%	F	< 60%
A	93-96%	B	83-86%	C	73-76%	D	63-66%		
A-	90-92%	B-	80-82%	C-	70-72%	D-	60-62%		

You are expected to take the practical exam and do presentations on their scheduled dates and times, as indicated on the schedule at the end of the syllabus. If unanticipated circumstances (*e.g.*, illness, death in the family) make it impossible for you to take an exam on its scheduled date and time, **you must** contact Dr. Fanselow **BEFORE** the scheduled date and time to make other arrangements. It is preferable that you speak with me directly but, at a minimum, you must send me an email (fanselow@pitt.edu) and/or leave a message on my office phone (412-383-6051) before the exam. Also, the circumstances that prevent you from being present for an exam must be documented (*e.g.*, a letter from physician, obituary). I understand that some students may need to miss an exam or presentation due to interviews for graduate, medical, or other professional schools. If this is the case, you should make arrangements with me at least two weeks prior to the exam or presentation so we can find a time for you to do it, either before you leave or after you return. You will receive a zero for the exam if you do not follow these policies. **There will be no exceptions.**

Office appointments

Prior experience has demonstrated that scheduled, weekly office hours do not work well in this course. However, I am more than happy to meet with you to address any questions you have regarding the material covered in lectures or projects. Simply send me an email that contains a few times that are best for you to meet and I will get back to you to find a time that works for both of us. However, I cannot guarantee I will have time to meet if contacted with less than 48 hour notice, especially in the week or so prior to an exam.

Academic policies

Academic Integrity: Cheating/plagiarism will not be tolerated. Students suspected of violating the University of Pittsburgh Policy on Academic Integrity, noted below, will be required to participate in the outlined procedural process as initiated by the instructor. A minimum sanction of a zero score for the quiz, exam or paper will be imposed. (For the full Academic Integrity policy, go to www.provost.pitt.edu/info/ai1.html.) Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries, phones, “smart” watches, programmable calculators, and other devices that could be used to retrieve, send, or store information such as course material.

The integrity of the academic process requires fair and impartial evaluation on the part of faculty and honest academic conduct on the part of students. To this end, students are expected to conduct themselves at a high level of responsibility in the fulfillment of the course of their study. It is the corresponding responsibility of faculty to make clear to students those standards by which students will be evaluated, and the resources permissible for use by students during the course of their study and evaluation. The educational process is perceived as a joint faculty-student enterprise which will perforce involve professional judgment by faculty and may involve – without penalty-reasoned exception by students to the data or views offered by faculty.

Email Communication Policy: Each student is issued a University e-mail address (username@pitt.edu) upon admittance. This e-mail address may be used by the University for official communication with students. Students are expected to read e-mail sent to this account on a regular basis. Failure to read and react to University communications in a timely manner does not absolve the student from knowing and complying with the content of the communications. The University provides an e-mail forwarding service that allows students to read their e-mail via other service providers (e.g., Hotmail, AOL, Yahoo). Students that choose to forward their e-mail from their pitt.edu address to another address do so at their own risk. If e-mail is lost as a result of forwarding, it does not absolve the student from responding to official communications sent to their University e-mail address. To forward e-mail sent to your University account, go to <http://accounts.pitt.edu>, log into your account, click on **Edit Forwarding Addresses**, and follow the instructions on the page. Be sure to log out of your account when you have finished. (For the full E-mail Communication Policy, go to www.bc.pitt.edu/policies/policy/09/09-10-01.html.)

Disability Services: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 140 William Pitt Union, 412-648-7890/412-383-3346 (Fax), as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable accommodations for this course.

Accessibility: Blackboard is ADA Compliant and has fully implemented the final accessibility standards for electronic and information technology covered by Section 508 of the Rehabilitation Act Amendments of 1998. Please note that, due to the flexibility provided in this product, it is possible for some material to inadvertently fall outside of these guidelines.

Copyright Notice: These materials may be protected by copyright. United States copyright law, 17 USC section 101, et seq., in addition to University policy and procedures, prohibit unauthorized duplication or retransmission of course materials. See [Library of Congress Copyright Office](#) and the [University Copyright Policy](#).

Statement on Classroom Recording: To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student’s own private use.

Prohibition Against Electronic Devices During Exams: All electronic devices capable of sending, receiving, or storing information are expressly forbidden from use during exams in this class. This includes cell phones, text messaging devices, iPods, iPads, PDAs, cell watches, and similar devices that may not even have been invented yet.

Natural Science General Education Requirement: This course fulfills one Dietrich School of Arts and Sciences Natural Science General Education Requirement (GER) as described for the GERs starting Fall 2018 (term 2191). That GER reads as follows: *Three Courses in the Natural Sciences:* These will be courses that introduce students to scientific principles and concepts rather than offering a simple codification of facts in a discipline or a history of a discipline. The courses may be interdisciplinary, and no more than two courses may have the same primary departmental sponsor.

Schedule for FUNCTIONAL NEUROANATOMY LAB PRACTICUM, Spring 2020, Dr. Fanselow

CLASS 1 (January 6): Gross anatomy 1

- Introduction to course and human brain specimens; formaldehyde training
- Lecture: Introduction/review of basic anatomical structures in the brainstem and brain

CLASS 2 (January 13): Gross anatomy 2

- Lecture: Ventricles, basal ganglia, internal capsule, and thalamus
- Introduce brain structure 3D modeling project and Tinkercad software

CLASS 3 (January 27): Gross anatomy 3 and angiography

- Lecture: Vasculature, sinuses, and cerebellum; brain cross-section landmarks; angiography
- Tinkercad in-class project and begin planning brain structure 3D model with group members

CLASS 4 (February 3): Brain injury and brain imaging techniques

- Lecture: Stroke, imaging brain pathologies
- Work on brain structure 3D model

CLASS 5 (February 10): Sheep brain dissection and preparation for practical exam

- Sheep brain dissection
- Preparation for practical exam
- Work on brain structure 3D model

CLASS 7 (February 17): PRACTICAL EXAM

CLASS 8 (February 24)

- Lecture: Hippocampus and related structures
- Introduce and work on brain injury reconstruction project

CLASS 9 (March 2)

- Lecture: Neuroanatomical techniques
- Work on brain injury reconstruction project
- Work on brain structure 3D model (prototype due next week)

CLASS 10 (March 16)

- Work on brain injury reconstruction project
- Work on brain structure 3D model (**Prototype 3D models due for printing by 11:59 PM**)

CLASS 11 (March 23)

- Preliminary brain injury reconstruction project presentations: anatomy and imaging examples
- Assess brain structure printed 3D model prototype and refine model

CLASS 12 (March 30)

- Work on brain injury reconstruction project
- Work on brain structure 3D models (final model due next week)

CLASS 13 (April 6)

- Final brain injury reconstruction project presentations
- Work on brain structure 3D models (**Final 3D models due for printing by 11:59 PM**)

CLASS 14 (April 13):

- Lecture: Brain surgery and stimulation
- Work on final 3D model prints

CLASS 15 (April 21) 10:00-11:50 AM: Present brain structure 3D models to class and discuss their construction