

## **SYLLABUS for SYNAPTIC TRANSMISSION, FALL 2019**

NROSCI 1017 – 1100 (25465)

MWF 11:00-11:50, A221 Langley Hall (*Note: there is no recitation section for this course*)

Instructor: Erika E. Fanselow, Ph.D., Department of Neuroscience

Office: 449 Crawford Hall (enter through 446 Crawford)

Office phone: 412-383-6051

Email: [fanselow@pitt.edu](mailto:fanselow@pitt.edu)

Office hours: Mondays, 2:30-3:30; Fridays, 12:00-1:00; or by appointment

Graduate Teaching Assistant (office hours by appointment):

Manaswini (Mannu) Kar ([mak433@pitt.edu](mailto:mak433@pitt.edu))

Undergraduate Teaching Assistants (office hours by appointment):

Allison Caswell ([ALC255@pitt.edu](mailto:ALC255@pitt.edu))

Noelle Eghbali ([NOE4@pitt.edu](mailto:NOE4@pitt.edu))

Amanda Makara ([arm196@pitt.edu](mailto:arm196@pitt.edu))

Revathy Pillai ([RKP24@pitt.edu](mailto:RKP24@pitt.edu))

Danyall (Dan) Saeed ([saeed.d@pitt.edu](mailto:saeed.d@pitt.edu))

### **Course materials**

There are two main materials used during this course. The first is a **required textbook**, which you may purchase from a variety of sources, including the Pitt bookstore and the publisher (Elsevier: <https://www.elsevier.com/books/synaptic-transmission/meriney/978-0-12-815320-8>)

*Synaptic Transmission* (2019) Meriney and Fanselow

**Paperback ISBN:** 9780128153208; **eBook ISBN:** 9780128153215

The second set of materials are copies of the **slides used in class**, which will be posted on CourseWeb (<https://courseweb.pitt.edu>) prior to the lectures. Many students find it useful to print these and take notes on them during the lectures, though this is certainly not required.

**There will be further information presented in class that supplements the book and slides and for which you will be responsible on exams.**

CourseWeb will also be used to post course announcements. Important announcements may also be sent to your university email account ([name@pitt.edu](mailto:name@pitt.edu)). 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.**

**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 grades

Your course grade will be based on the following:

1. Four exams (one per block), worth 100 points each
2. Four online quizzes (one per block), worth 10 points each
3. Two assignments (one during block 1 and one during block 2), worth 10 points each

The total number of points you earn will be divided by the total points possible (460) to determine your course grade (as a percent). **No exams, quizzes, or assignments may be dropped. A schedule that includes dates of exams and the availability/due dates for quizzes and assignments is at the end of this syllabus.**

Course 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%		

## Exams

There will be four exams given during the term (see dates on course schedule on last page of this syllabus). These exams will all be closed-book and closed-notes. They will not be cumulative, except for the fact that the material learned later in the course will naturally build on material covered earlier. Exams will be a combination of multiple choice and short-answer questions. Exams will cover all material presented in class, as well as material from the book, as indicated for each unit. **You may NOT drop any exams.**

**You are expected to take each exam at its scheduled date and time.** If unanticipated circumstances (*e.g.*, illness, death in the family) make it impossible for you to take an exam at the scheduled time, **you must** contact me prior to the scheduled date to make other arrangements. It is preferable that you speak with me directly but, at a minimum, you must send me an email (preferred method; [fanselow@pitt.edu](mailto:fanselow@pitt.edu)) and/or leave a message on my telephone answering machine (412-383-6051) before the exam. Also, the circumstances that prevent you from being present must be documented (*e.g.*, letter from physician, obituary). I understand that some of you may miss an exam due to interviews for graduate or medical school, or for another acceptable reason (*e.g.* religious observance, military service). In cases like this where you know in advance that you cannot make the exam at the scheduled time, you need to make arrangements with me **at least one week prior to the exam** so we can find a time for you to take 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.**

### Pre-exam review sessions:

Review sessions will be held prior to each exam, including the final. The dates and times for these pre-exam review sessions will be indicated on CourseWeb once their rooms have been reserved. The pre-exam review sessions will include answering students' questions about the material, so please bring any questions you have.

### Post-exam viewing sessions:

Exams will be available for students to view only until the subsequent exam is taken. Grades for exams will be posted on CourseWeb after all of the exams have been graded, and you may view your exam during the post-exam viewing sessions that will be scheduled after each exam. The dates and times for these post-exam viewing sessions will be indicated on CourseWeb once the rooms for them have been scheduled. If you are unable to make it to these sessions, contact the instructor or the graduate TA to schedule an appointment to view your exam. No exam questions may be copied or photographed in any way, and exams may not be removed from classrooms or review sessions.

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## Quizzes

There will be a total of four online quizzes (one per block), each worth 10 points. **You may NOT drop any quizzes.** The purposes of the quizzes include encouraging you to keep up with the material, highlighting topics you might be struggling with, and becoming familiar with the formats of questions that will be on the exams (though please note that the quizzes do not include short-answer format questions; they are multiple-choice only). The quizzes are open-book/notes. You can take each quiz only once, and once you start it you will have 30 minutes to complete it. Answers to the quiz questions will be made available after the quiz is due. You may find the questions and answers by clicking on the number that indicates your quiz score on CourseWeb.

Quizzes will be available on CourseWeb by approximately 7:00 PM on the dates indicated on the course schedule at the end of the syllabus, and they are **due by 11:59 PM** several days later, as indicated on the course schedule. Students must submit their answers on CourseWeb **BEFORE 11:59 PM** on the indicated due dates in order to get points for correct answers. Each quiz will be closed (*i.e.* unavailable) at 11:59 PM on the day it is due, and will not be available thereafter. If you experience technical problems with accessing a quiz or while taking it, email me ([fanselow@pitt.edu](mailto:fanselow@pitt.edu)) immediately; this must be done **BEFORE** the quiz is due. Please also take a screenshot of the error message, including the time when you experienced it. I encourage you not to leave quizzes until the last minute, in case you do have technical issues.

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## Assignments

There will be two assignments given, based on the neurophysiology material in Block 1 and quantal analysis in Block 2. The exact dates on which these assignments will be made available are TBD, according to exactly when we have covered the relevant material during lectures. The assignment due dates are indicated on the course schedule at the end of this syllabus. Both assignments will be made available on CourseWeb and will also be submitted on CourseWeb upon completion.

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## Office hours and appointments

Office hours for this course will be held weekly in my office, as indicated on the first page of the syllabus (subject to occasional changes during the term, when necessary). Additionally, I am available to meet with you outside of these times to address any questions you have regarding the material covered in lectures or assignments. If you would like to set up an appointment, please send me an email that contains several times that are best for you to meet during the upcoming week and I will get back to you regarding which of those times would fit into my schedule or suggest other times, if necessary. You are also welcome to contact any of the TAs for this course and schedule a time to meet with them on campus at a time and location that is convenient for them. I cannot guarantee I will have time to meet if contacted with less than 48 business hours' notice, especially in the week or so prior to an exam. Also, be aware that if I or the TAs set a time to meet with you, we do reserve that time for you. Please be considerate and be on time, or give at least 24 business hours' notice if you need to cancel.

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## 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](http://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](mailto: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](http://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](#). None of the materials for this course may be posted on line in any form.

**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 course. 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.

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**COURSE SCHEDULE for SYNAPTIC TRANSMISSION, Fall 2019, Dr. Fanselow**

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**PLEASE NOTE:** the material we cover in each block may vary slightly from this schedule, depending on the durations of lectures and discussions in class. Exams, quizzes, and assignments will only include material we have covered prior to the exam or due date, and these dates will not change (barring unforeseen circumstances).

**BLOCK 1: Synapse structure and neurophysiology**

Unit 1: Introduction to synapses and their structures

Unit 2: Neurophysiology

**Quiz 1:** posted: 9/9; due: 9/12 at 11:59 PM

**Assignment 1:** due 9/11 at 11:59 PM

**Exam 1:** 9/16 (in class)

**BLOCK 2: Regulation of neurotransmitter release**

Unit 3: Quantal theory and analysis

Unit 4: Vesicular release

Unit 5: Endocytosis and vesicle trafficking

Unit 6: Release of multiple transmitters

Unit 7: Electrical synapses

**Quiz 2:** posted: 10/2; due: 10/7 at 11:59 PM

**Assignment 2:** due 9/30 at 11:59 PM

**Exam 2:** 10/11 (in class)

**BLOCK 3: Receptors and signaling**

Unit 8: Ionotropic receptors

Unit 9: Metabotropic receptors

Unit 10: Synaptic plasticity

**Quiz 3:** posted: 10/23; due: 10/28 at 11:59 PM

**Exam 3:** 11/4 (in class)

**BLOCK 4: Neurotransmitters**

Unit 11: Acetylcholine

Unit 12: Monoamine neurotransmitters

Unit 13: Amino acid neurotransmitters

Unit 14: Neuropeptides

Unit 15: Gaseous transmitters

Unit 16: Tripartite synapses

**Quiz 4:** posted: 11/15; due: 11/20 at 11:59 PM

**Exam 4:** 12/11 12:00-1:15 PM (Note: there is no final exam for this course. The exam for block 4 will be given during finals week, but is not cumulative.)