

## Sensory & Motor Systems Neuroscience, BMSC-GA 2611.002 and G80/89.2202, Spring 2015

### Lectures

Tuesdays & Thursdays, 10:00 am - 11:50

Downtown: Meyer Hall (6 Washington Place), Rooms 808 (Tues) or 815 (Thurs)

Uptown: Alexandria 9th Floor Conference Room

### Labs

Fridays, 9:30-1:30 (Group A) or 1:30-5:30 (Group B)

NS2 labs run in parallel to the course (similar to the Cellular Neuroscience course). Neuroscience PhD students should co-register for NEURL-GA 2204 (Lab in Neural Science II). Labs will be held most Fridays when there isn't a scheduled conference (see below).

### Conferences

There are 5 conferences throughout the semester. The conference schedule is:

	<u>Group A (Date, Time, Location)</u>			<u>Group B (Date, Time, Location)</u>		
Conference 1	2/13	10 am – 12 pm	Meyer 808	2/13	1:30 – 3:30 pm	Meyer 808
Conference 2	3/13	10 am – 12 pm	Meyer 808	2/27	1:30 – 3:30 pm	Meyer 808
Conference 3	4/10	10 am – 12 pm	Alexandria 901	4/10	1:30 – 3:30 pm	Alexandria 901
Conference 4	4/24	10 am – 12 pm	Meyer 808	4/24	1:30 – 3:30 pm	Alexandria 901
Conference 5	4/28	4 – 6 pm	Alexandria 901	4/30	4 – 6 pm	Alexandria 901

### Exams and Grading

There will be 2 take-home exams, each counting for one-half of the final grade. The format of the exam questions will be short essays.

- Exam 1 will be distributed on March 13 and answers will be due March 24.
- Exam 2 will be distributed May 8 and answers will be due May 15.

Participation in the conferences is also required to receive credit for the course (see below for more detail on the Conferences). Each unexcused conference absence will result in a letter grade reduction (A to A-, B+ to B, etc.).

### Textbook

Squire LR, Berg D, Bloom FE, du Lac S, Ghosh A, Spitzer NC (2012). *Fundamental Neuroscience* (4<sup>th</sup> edition). San Diego: Academic Press.

### Readings

A list of assigned readings from the textbook and from the primary literature can be found on the Syllabus page of the course website by lecture. PDFs of journal articles (and lecture slides) are available in the Resources tab.

Some readings are labeled as "secondary readings". We strongly encourage you to read all the papers, but for some topics there are quite a few papers assigned, as there often isn't a single review paper that covers all relevant material. At the same time, we do not expect you to read every word. Because of the overwhelming amount of scientific literature in every sub-area of neuroscience, you need to develop a skill for rapidly scanning the literature to glean the basics, and then be able to go back as needed for the details. For topics with a long reading list, you should look through each of the "secondary readings" to

see what's there, read the abstract and introduction, look at the figures and figure captions. This is the same as what you should do when exploring the literature in your area of research. Then, based on your interests and what you feel you need to know, you can pick and choose which of these "secondary readings" to read in more detail.

### Conferences

Conferences are like journal club discussion sessions. Two (or more) papers will be assigned for each conference. Each student will be responsible for leading the discussion of one paper for one conference; we will distribute these assignments at the beginning of the semester. Students are not expected to prepare a lecture, but must be prepared to lead a discussion of the paper by providing an introduction to the topic, details of the hypotheses tested, methods used, and results found. Presenting students will need to place the paper in the broader context of its field, and this will likely require presenters to read additional papers. **Presenters should contact the faculty in charge of their conference well in advance to discuss their presentation and get suggestions for additional papers to aid their preparation for leading the conference.** The faculty members leading each conference are listed in the syllabus. Note that students should take the initiative in contacting the faculty member in charge of their conference, but if a problem arises contact [annette.gray@nyumc.org](mailto:annette.gray@nyumc.org).

All students are required to read all the papers and contribute to the discussion. To aid preparation, you will be given specific questions to answer for each paper. Print your answers and hand them in at the end of each conference. Attendance is required. **Each unexcused conference absence will result in a letter grade reduction (A to A-, B+ to B, etc.).** More than one absence may result in no credit for the course.

Because the class is so large this year, we will split you into two sections/groups for each conference: group A and group B.

### Grading

There will be 2 take-home exams, each counting for one-half of the final grade. The format of the exam questions will be short essays. Participation in the conferences is also required (as noted above) to receive credit for the course. Each unexcused conference absence will result in a letter grade reduction (A to A-, B+ to B, etc.).

**NS2 Schedule of Lectures, Conferences and Exams**
**Spring 2015**

Date	Lec/Conf	Location	Topic (faculty leaders)
Jan 27	Lec	Meyer 808	Retina (Hawken)
Jan 29	Lec	Meyer 815	Functional architecture of the LGN & V1 cortex (Hawken)
Feb 3	Lec	Meyer 808	Striate cortex: functional characteristics of receptive fields (Movshon)
Feb 5	Lec	Meyer 808	Extrastriate visual cortex: dorsal pathway (Movshon)
Feb 10	Lec	Meyer 808	Extrastriate visual cortex: ventral pathway (Movshon)
Feb 12	Lec	Meyer 815	Development of visual cortex (Movshon)
Feb 13	Conf (10-Noon)	Meyer 808	(Movshon)
	Conf (1:30-3:30)	Meyer 808	(Hawken)
Feb 17	Lec	Meyer 808	Perceptual decision-making (Kiani)
Feb 19	Lec	Meyer 815	V1 theory & computation (Heeger)
Feb 24	Lec	Meyer 808	Visual cortex, fMRI, & psychophysics (Heeger)
Feb 26	Lec	Meyer 808	Theories of encoding of sensory information (Simoncelli)
Feb 27	Conf (1:30-3:30)	Meyer 808	(Heeger)
Mar 3	Lec	Meyer 808	Theories of decoding of sensory information (Simoncelli)
Mar 5	Lec	Alexandria 901	Somatosensation: periphery (Gardner)
Mar 10	Lec	Alexandria 901	Somatosensation: central (Gardner)
Mar 12	Lec	Alexandria 901	Pain and temperature sense (Gardner)
Mar 13	Conf (10-Noon)	Meyer 808	(Simoncelli)
	<b>Midterm I exam given</b>		
Mar 24	Lec	Alexandria 901	Audition: periphery (Froemke)
	<b>Midterm I exam due</b>		
Mar 26	Lec	Alexandria 901	Audition: central I (Froemke)
Mar 31	Lec	Alexandria 901	Audition: central II (Froemke)
Apr 2	Lec	Alexandria 901	Chemical senses: periphery (Rinberg)
Apr 7	Lec	Alexandria 901	Chemical senses: central (Rinberg)
Apr 9	Lec	Alexandria 901	Muscles, motor neurons & motor pools (Lang)
Apr 10	Conf (10-Noon)	Alexandria 901	(Rinberg, Ringstad)
	Conf (1:30-3:30)	Alexandria 901	
Apr 14	Lec	Alexandria 901	Reflexes I: Sherrington reflexes & CPGs (Lang)
Apr 16	Lec	Alexandria 901	Reflexes II: posture & locomotion (Lang)
Apr 21	Lec	Meyer 808	Descending motor control, motor cortex (Kiani)
Apr 23	Lec	Meyer 815	Sensorimotor integration, posterior parietal cortex (Kiani)
Apr 24	Conf (10-Noon)	Meyer 808	(Kiani)
	Conf (1:30-3:30)	Alexandria 901	(Long)
Apr 28	Lec	Alexandria 901	Cerebellum (Llinas)
	Conf (4-6pm)	Alexandria 901	(Lang, Long)
Apr 30	Lec	Meyer 815	Eye movements I: VOR & OKN (Glimcher)
	Conf (4-6pm)	Alexandria 901	(Lang, Long)
May 5	Lec	Meyer 808	Eye movements II: saccades, pursuit, vergence (Glimcher)

May 7	Lec	Meyer 815	Basal ganglia (Glimcher)
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May 8	<b>Final exam given</b>		
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May 15	<b>Final exam due</b>		
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