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:

	Group A (Date, Time, Location)			Group B (Date, Time, Location)		
Conference 1	2/13 10 a	am – 12 pm	Meyer 808	2/13	1:30 - 3:30 pm	Meyer 808
Conference 2	3/13 10 a	am – 12 pm	Meyer 808	2/27	1:30 - 3:30 pm	Meyer 808
Conference 3	4/10 10 a	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 (4th 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.

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

Jan 27	Date	Lec/Conf	Location	Topic (faculty leaders)			
Feb 3 Lec Meyer 808 Striate cortex: functional characteristics of receptive fields (Movshon) Feb 10 Lec Meyer 808 Extrastriate visual cortex: dorsal pathway (Movshon) Feb 10 Lec Meyer 808 Extrastriate visual cortex: ventral pathway (Movshon) Feb 11 Conf (10-Noon) Meyer 808 (Movshon) Conf (1:30-3:30) Meyer 808 (Movshon) Feb 12 Lec Meyer 808 Perceptual decision-making (Klani) Feb 13 Lec Meyer 808 Perceptual decision-making (Klani) Feb 14 Lec Meyer 808 Visual cortex, fMRI, & psychophysics (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 10 Lec Alexandria 901 Somatosensation: central (Gardner) Mar 12 Lec Alexandria 901 Alexandria 901 Midterm I exam given Mar 13 Conf (10-Noon) Meyer 808 Midterm I exam given Mar 26 Lec Alexandria 901 Audition: periphery (Froemke) Midterm I exam given Mar 26 Lec Alexandria 901 Audition: central I (Froemke) Apr 2 Lec Alexandria 901 Audition: central I (Froemke) Apr 3 Lec Alexandria 901 Chemical senses: periphery (Rinberg) Apr 4 Lec Alexandria 901 Alexandria 901 Chemical senses: central (Rinberg) Apr 5 Lec Meyer 808 Perceptual decision-making (Klani) Apr 24 Lec Alexandria 901 Alexandria 901 Chemical senses: central (Rinberg) Apr 25 Lec Alexandria 901 Reflexes II: posture & locomotion (Lang) Apr 26 Lec Alexandria 901 Reflexes II: posture & locomotion (Lang) Apr 27 Lec Alexandria 901 Reflexes II: posture & locomotion (Lang) Apr 28 Lec Meyer 808 Descending motor control, motor cortex (Kiani) Apr 29 Lec Alexandria 901 Cerebellum (Llinas) Conf (1:30-3:30) Alexandria 901 (Long) Apr 29 Lec Alexandria 901 (Long) Apr 20 Lec Alexandria 901 Cerebellum (Llinas) Conf (4-6pm) Alexandria 901 (Long, Long) Eye movements I: VOR & OKN (Glimcher) Eye movements I: vor Receptual Perceptual Perceptual Perceptual Perceptual Perceptual Perceptual Perceptual Perceptual Perceptual Percept	Jan 27	Lec	Meyer 808	Retina (Hawken)			
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Mar 24 Lec Alexandria 901 Audition: periphery (Froemke) Mar 26 Lec Alexandria 901 Audition: central I (Froemke) Mar 31 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 (Rinberg, Ringstad) Conf (1:30-3:30) Alexandria 901 Apr 14 Lec Alexandria 901 Apr 15 Apr 16 Lec Alexandria 901 Apr 16 Lec Meyer 808 Apr 21 Lec Meyer 808 Apr 23 Lec Meyer 815 Conf (1:30-3:30) Alexandria 901 Apr 24 Conf (10-Noon) Meyer 808 Conf (1:30-3:30) Alexandria 901 Apr 24 Conf (1:30-3:30) Alexandria 901 Apr 28 Lec Alexandria 901 Conf (4-6pm) Alexandria 901 Apr 30 Lec Meyer 815 Conf (4-6pm) Alexandria 901 Apr 30 Lec Meyer 815 Conf (4-6pm) Alexandria 901 Alexandria 901 Lec Meyer 815 Conf (4-6pm) Alexandria 901 Alexandria 901 Lec Meyer 815 Conf (4-6pm) Alexandria 901 Lec Meyer 815 Eye movements I: VOR & OKN (Glimcher) Lang, Long) Eye movements II: saccades, pursuit, vergence	Mar 12	Lec	Alexandria 901	Pain and temperature sense (Gardner)			
Mar 24 Lec Alexandria 901 Audition: periphery (Froemke) Mar 26 Lec Alexandria 901 Audition: central I (Froemke) Mar 31 Lec Alexandria 901 Audition: central I (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 Conf (1:30-3:30) 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) By 6 Meyer 808 Eye movements II: saccades, pursuit, vergence	Mar 13	Conf (10-Noon)	Meyer 808	(Simoncelli)			
Midterm I exam due Mar 26 Lec Alexandria 901 Audition: central I (Froemke) Mar 31 Lec Alexandria 901 Chemical senses: periphery (Rinberg) Apr 2 Lec Alexandria 901 Chemical senses: central (Rinberg) Apr 9 Lec Alexandria 901 (Rinberg, Ringstad) Apr 10 Conf (10-Noon) Alexandria 901 (Rinberg, Ringstad) 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 (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							
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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) 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 (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		Midterm I exam	due				
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Apr 7 Lec Alexandria 901 Chemical senses: central (Rinberg) Apr 9 Lec Alexandria 901 (Rinberg, Ringstad) Apr 10 Conf (10-Noon) Alexandria 901 (Rinberg, Ringstad) 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 (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	Mar 31	Lec	Alexandria 901	Audition: central II (Froemke)			
Apr 9 Lec Alexandria 901 (Rinberg, Ringstad) Apr 10 Conf (1:30-3:30) Alexandria 901 Apr 14 Lec Alexandria 901 Apr 16 Lec Alexandria 901 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 (1:30-3:30) Alexandria 901 Apr 28 Lec Alexandria 901 Apr 30 Lec Meyer 815 Eye movements I: VOR & OKN (Glimcher) Conf (4-6pm) Alexandria 901 Muscles, motor neurons & motor pools (Lang) (Rinberg, Ringstad) Reflexes I: Sherrington reflexes & CPGs (Lang) Reflexes II: posture & locomotion (Lang) Descending motor control, motor cortex (Kiani) Sensorimotor integration, posterior parietal cortex (Kiani) (Long) Cerebellum (Llinas) (Lang, Long) Eye movements I: VOR & OKN (Glimcher) (Lang, Long) Eye movements II: saccades, pursuit, vergence	Apr 2	Lec	Alexandria 901	Chemical senses: periphery (Rinberg)			
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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 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	Apr 16	Lec	Alexandria 901	Reflexes II: posture & locomotion (Lang)			
Apr 24 Conf (10-Noon) Meyer 808 (Kiani) Conf (1:30-3:30) Alexandria 901 (Long) Apr 28 Lec 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	Apr 21	Lec	Meyer 808	Descending motor control, motor 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	Apr 23	Lec	Meyer 815	Sensorimotor integration, posterior parietal cortex			
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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	Apr 24	Conf (10-Noon)	Meyer 808	(Kiani)			
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		Conf (1:30-3:30)	Alexandria 901	(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	Apr 28	Lec	Alexandria 901	Cerebellum (Llinas)			
Conf (4-6pm) Alexandria 901 (Lang, Long) May 5 Lec Meyer 808 Eye movements II: saccades, pursuit, vergence		Conf (4-6pm)	Alexandria 901	(Lang, Long)			
May 5 Lec Meyer 808 Eye movements II: saccades, pursuit, vergence	Apr 30	Lec	Meyer 815	Eye movements I: VOR & OKN (Glimcher)			
		Conf (4-6pm)	Alexandria 901	(Lang, Long)			
(Glimcher)	May 5	Lec	Meyer 808	Eye movements II: saccades, pursuit, vergence			
				(Glimcher)			

May 7 Lec Meyer 815 Basal ganglia (Glimcher)

May 8 Final exam given
May 15 Final exam due