

Neuroscience 524
Neurobiology II: An Introduction to Brain and Behavior

140 Bardeen – Medical Science Center

Lectures: Mon and Wed 2:25-3:40 PM

| <i>Date</i> | | <i>Topic</i> | <i>Lecturer</i> | <i>Readings</i> | |
|----------------------------------|----------|---|-----------------|--------------------|-----------|
| Introduction | | | | | |
| Jan 23 | M | Introduction | Yin | Purves Chap 1,2 | Sacks |
| Jan 25 | W | Somatosensation I | Yin | Chap 9, 10 | 5,6 |
| Perception | | | | | |
| Jan 30 | M | Somatosensation II | Yin | Chap 9, 10 | |
| Feb 1 | W | Vision I | Huang | Chap 11 | |
| Feb 6 | M | Vision II | Huang | Chap 12 | |
| Feb 8 | W | Higher order vision | Huang | Chap 26 | 1, 8 |
| Feb 13 | M | Audition I (labs this week) | Yin | Chap 13 | |
| Feb 15 | W | Audition II | Yin | Chap 13 | |
| Feb 20 | M | Methods for imaging the brain | Guller | | |
| Feb 22 | W | Vestibular and chemical senses | Yin | Chap 14, 15 | 18 |
| Action | | | | | |
| Feb 27 | M | Exam I (up to and including Feb 17) | | | |
| Feb 29 | W | Spinal cord | Populin | Chap 16 | 3 |
| Mar 5 | M | Descending control | Populin | Chap 17 | |
| Mar 7 | W | Cerebellum | Populin | Chap 19 | |
| Mar 12 | M | Basal ganglia (labs this week) | Populin | Chap 18 | 7, 11, 16 |
| Mar 14 | W | Motor cortex | Populin | Chap 17 | |
| Mar 19 | M | Higher motor centers | Populin | Chap 17 | 8 |
| Mar 21 | W | Oculomotor system | Populin | Chap 20 | |
| Mar 27 | M | Neuroethology of perception and action | Yin | | |
| Mar 29 | W | Exam II (up to and including March 22) | | | |
| Mar 31-Apr 8 Spring break | | | | | |
| Higher order functions | | | | | |
| Apr 9 | M | Language | Yin | Chap 27 | 9, 15 |
| Apr 11 | W | Neuronal plasticity | Yin | Chap 24, 25 | |
| Apr 16 | M | Cognition I- association cortex | Yin | Chap 26 | 8, 23 |
| Apr 18 | W | Cognition II – prefrontal cortex | Koenigs | Chap 26 | |

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|-------------|---|-----------------|-----------------|
| Apr 23 | M Motivation and emotions I | Yin | Chap 29 |
| Apr 25 | W Motivation and emotions II | Yin | Chap 29 |
| Apr 30 | M Learning and memory I | Kundu | Chap 31 |
| May 2 | W Learning and memory II | Kundu | Chap 31 |
| May 7 | M Neurobiology of sleep | Guller | Chap 28 |
| May 9 | W Neurobiology of disease | Guller | |
| May 14 | M 12:25 FINAL EXAM (semi-cumulative) | | |

We encourage you to contact us via e-mail if you have any concerns, questions, or compliments.

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Teaching Assistants

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 Wed 12:30-1:30

Webpage: The course webpage is available on Learn@UW. You will find this syllabus, copies of the powerpoint files from lectures, additional information relevant to the course as well as links to other interesting neuroscience-related webpages there. Check it often!

Email: We will periodically send out notices and announcements to the class by email. We will assume that you have received these messages within 24 hours, so be sure to check your email at least daily. We will try, but do not promise, to answer all emails promptly. If your question is one that pertains to everyone in the course, you may find that our answer is directed back to everyone in the class. Most commonly this happens if someone asks a question pertaining to an exam.

Lectures and textbook: The recommended textbook for the course is *Neuroscience* by Purves et al. (2012, 5th edition) which is up-to-date and has nice color graphics. For each lecture we have assigned the relevant chapters in Purves. You will understand the lecture material much better if you read the chapter before the lecture. However, we will not be lecturing from the textbook, i.e. the lectures will not cover the same material. Since the textbook is chiefly for background reading, you will be responsible only for the material presented in lecture. You are not responsible for information in the book that is not covered in lecture. If you are on a limited budget and have the earlier editions of Purves et al. or one of a

number of other recent neurobiology textbooks, they should be adequate. Some of these textbooks include:

Fundamental Neuroscience by Squire et al.; Academic Press, 2002 or 2008.

Principles of Neural Science by Kandel, Schwartz and Jessell; Elsevier, 2000.

Neuroscience, Exploring the Brain by Bear et al.; Williams and Wilkins, 2001 or 2007.

Biological Psychology by Rosenzweig, Leiman and Breedlove; Sinauer Assoc., 1999.

In addition, we are recommending that you read the popular paperback book by Oliver Sacks, *The Man Who Mistook His Wife for a Hat*. This reading is for your enjoyment and edification but it is relevant to several sections of the course, as indicated on the syllabus.

Neuroanatomy labs: during the course we will have two small group neuroanatomy labs to introduce you to the brain. Sign up for the labs will be done the week before the labs. You will be responsible for this material so make sure you go to the labs. Labs will meet in 3330S MSC.

Grading: your final grade will be based on a final exam (~37%), two hourly exams (~26% each), class participation and homework assignments (10%). The first two exams will not be cumulative. About 30% of the final exam will be questions aimed at integrating information from the whole course while the remaining 70% of the final will cover the material since the second exam. The grades for the course will be determined from an absolute scale (see below). This means that you are not competing with your neighbor and that **it is to your benefit to work and study together**. Indeed, we will encourage you to work together during this course, both during and outside of lectures. We reserve the right to slide the scale downward (i.e. giving higher grades than those listed below for the same numerical scores) if the class performs worse than expected.

| | |
|--------|----|
| 91-100 | A |
| 88-90 | AB |
| 81-87 | B |
| 78-80 | BC |
| 70-77 | C |
| 60-69 | D |
| <60 | F |

Examinations: the examinations will be a mix (about 50:50) of essay questions and multiple choice/short answer questions. You will be given a list of the essay questions that will be on the exam but you will not know which ones will be asked. We encourage you work in groups to prepare answers for all of the essay questions. Perhaps the best way to study for the multiple choice questions is to take the old exam on L@UW. The dates of all the exams are scheduled in the syllabus. Be sure to let us know well ahead of time if you have a conflict or cannot take the exam at its scheduled time. **If you miss an exam without letting us know beforehand, you will NOT be able to make up the exam.** Also if you have any special requirements for the examinations, please let us know ahead of time.

Class participation: In an effort to facilitate interactive class participation, during some lectures we will pose a question for you to answer while working with a small group of students (3-5) sitting nearby. Each group should come up with a collective answer and submit it to be graded as homework. If you are not in class, you won't get credit as there is no make-up for these assignments.

Homework: there will be some other homework assignments for the course. Some of these will be individual assignments, others are group activities done in Learn@UW. Collectively the class participation and homework assignments will be worth about 10% of your final grade.

Learn@UW (<https://learnuw.wisc.edu/>): You will be assigned randomly to a group of students and each group will be given various assignments to discuss as a group. Learn@UW allows you to work as a group without physically meeting since you can each post answers and discussion to a bulletin board. Credit will be given for meaningful participation in the discussions.

Extra credit: there are 3 opportunities for extra credit by writing up a short 1-2 page report on any of the following. These will be graded as lousy or good: no points for lousy and 1 point for good essays. Each extra credit point is worth about 3 points on an hour exam (or approximately 1% of your final grade). You can only do each activity once.

- ***Neurons in the news:*** on the course webpage we will post notices of new neurobiology discoveries. These are usually links to news reports of recent scientific papers. Read the news report, then find the original paper in the journal, and write a short critique of the original paper.
- ***Local neuro seminar:*** attend a local neuro seminar (see the list on the course website on Learn@UW) and write a report on it.
- ***Personal experience:*** tell us how something that you saw, heard, smelled, read, or otherwise experienced during the semester is related to a topic in the course. This could be something that reinforces or contradicts anything we have discussed.

Cell phones: turn them off before coming to lecture. No cell phones are permitted at the exams.