# The Syllabus (beta edition)

## 1 What’s this course about?

Cognitive Neuroscience (cogNeuro) explores the biological foundations of mental phenomena. In order to understand how your brain makes your mind possible, cogNeuro is a relatively new scientific enterprise, which stands on the shoulders of other, older disciplines. As a distinct entity, cogNeuro is a relative newcomer to the scientific scene, and in fact some of what cogNeuro hopes to explain remains, for the moment at least, beyond our reach.

The field—and this course—focuses on neurons, brain structures and networks, and, above all, the neural functions that are mind’s biological foundation. cogNeuro assumes that your ideas (brilliant and not-so-brilliant), your perceptions, your precious memories, actions, your decisions and thoughts of every variety all reflect brain states. Importantly, cogNeuro recognizes that the mind does not reside in some single place in the brain—a lone magical spot—, but emerges from dynamic interactions among neurons and ensembles of neurons.

To carry out its ambitious, important and fascinating program, cogNeuro exploits a range of tools and techniques. The goal is to examine the mind’s operation on multiple temporal and spatial scales. These temporal and spatial scales range from milliseconds and ion channels, at one end of the scales, all the up to hours and cubic centimeters, at their other end.

That description covers the field and ambitions of cogNeuro, but what about this particular course, NPsy22? What will you take away from the course besides a collection of fascinating facts and factoids? Like liberal arts courses in general, NPsy22 will encourage you to go beyond what the instructor or readings tell you. It will encourage you to think deeply and critically, to appreciate the power of ideas, to recognize where ideas seem to fail and to spot failures, and to imagine plausible alternatives to what, as of the moment, we are so darn sure that we know.

## 2 How will the course work?

Meetings are in lecture/discussion format, with lots of room for and encouragement of meaningful class participation. From our space on Latté you’ll be able to download the
images around which class meetings are organized. These can be useful for review and learning.

2.1 Latté

Some of the course’s activities take place on The Intertubes, notably the course’s Latté site. Please be mindful of privacy issues when you access our Latté site (or, for that matter, whenever you use email, respond to strangers’ offers of $20M in exchange for your social security and bank account information, or post potentially-embarrassing, NSFW stuff on Reddit, Facebook or Vines). Be aware that Latté keeps a tally of accesses from each user’s account, and that from time to time, the instructor may review that information in order to gauge effort, interest and progress. Just saying.

3 What will we read and think about?

One thing is the course’s textbook: *Brain and Behavior: A Cognitive Neuroscience Perspective*, by David Eagleman and Jonathan Downar. This 2016 book, referred to as E&N in the list of reading assignments below, will be augmented by short pieces downloadable from Latté. You should check Latté regularly for these. Note that unless a Latté posting is explicitly labelled “Optional,” it ain't.

4 What else will we have to do?

Please be aware that I expect all students to take an active, constructive role in class discussion. Even if you consider yourself shy, please, please, please make an effort to contribute —ask questions, offer observations. Contributions are best if they are fact-based. For example, pretty good contributions reflect the fact that you did the readings and and thought about them before class. By enrolling in this course, you pledge your personal commitment to complete assigned readings before class. If you seldom or never contribute to class discussion, you cannot get all that you should from the course. (Also see the Evaluation Section below).

Enrollment in this four-credit hour course obligates you to spend a minimum of nine hours of study time per week in preparation for class. This time includes reading, preparing papers, participating in review sections, and, not least, preparation for the three exams.
5 How will we be evaluated?

There will be three exams. The second and third exams will include multiple choice, short-answer and one or more short-essay questions; the first exam will include no essay questions. To help you organize and prepare, sample exams will be posted on Latté, along with a set of terms, concepts, and names, some of which could be on the exam. Incidentally, the third (“final”) examination is a hybrid between “cumulative” and “stand alone”: it will draw on material from the entire course, with considerable weighting for recency.

5.1 Treatment of exam performance

5.1.1 Individual exam scores

The numerical score on each exam will be normalized relative to the highest score in the class on that exam. That will translate each numerical score into values ranging from 1.0 downward. Example: If your score were 60, but the highest score in the class were 80, your normalized score would be 67/80, or 0.75.

5.1.2 Aggregate scores

To determine your total score for the course, each of your normalized exams scores will be weighted and summed to produce your total score. OK, but what is this weighting stuff? The normalized score on each of first exam will be weighted (multiplied) by 0.28; the normalized scores on the second and third exams will each be weighted by 0.36. I think these three weights sum to \(\sim 1.00\).

5.1.3 Translating into letters

The three normalized weighted scores will be summed and translated into a letter grade as follows: 0.85 to 1.00 will span the range A- to A+; 0.72 to 0.84 will span the range B- to B+; 0.61 to 0.71 will span the range C+ to C-. Aggregated weighted total scores 0.60 or below will receive D or below.

5.1.4 Bonus points

Needless to say, you will get more from the course if you do the reading ahead of time and think about what they’ve read. You’ll get even more from active, constructive participation during class meetings, and your constructive participation during class will enhance the benefits that all of us (the instructor not excluded) take away from the course. Therefore, I
reserve the right to boost the numerical scores for students who, in my judgment, consistently make valuable contributions to class discussion. That bonus will range up to 0.05, and will awarded to no more than 5-6 class members.

5.2 Exam dates

The reading schedule on the next page is a draft, like life itself subject to revision. However, the dates for exams are not. In fact, they are carved in granite. Please review the exam dates ASAP, and make sure that you have no obligations that might preclude your taking exams on the dates scheduled. If you do have such obligations, you are well advised either to modify them or, failing that, drop the course.

5.3 Learning goals

As a result of participating in this course, you should be able to: develop an understanding of the organization of the human brain; relate structure, at both network and cellular levels, to cognitive function; understand the key technologies used in cognitive neuroscience, including their limitations; think critically about normal and abnormal human cognitive function, and describe to others how the characteristics of everyday cognitive function relate to its neural substrates.

5.4 Replay and review.

If you wish to contest the grading of a question, your answer to that question will be reviewed. But, while doing that, it’s only fair that along with the contested question, your entire exam be reviewed. That review could produce an increased score, or a reduced score, neither of which is subject to further review.

6 What about extra-credit, makeup work?

Under no circumstances will opportunities for so-called extra credit work be given. The availability of ad-hoc, extra-credit arrangements tend to produce what economists call a “moral hazard” (ML Wilson, Atlantic Economic Journal, 2002, 30, 97). In particular, the possibility of such opportunities tends to induce students to prepare less carefully or less effectively for exams or papers, trusting that they could be rescued by extra credit work.
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<thead>
<tr>
<th>Dates</th>
<th>Topic</th>
<th>Readings</th>
</tr>
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<tbody>
<tr>
<td>8/30, 9/4</td>
<td>Introduction/Orientation</td>
<td>E&amp;D: Chpt 1</td>
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<tr>
<td>9/13, 9/18, 9/20</td>
<td>Neurons, channels, spikes, transmitters, synapses</td>
<td>E&amp;D: Chpt 3</td>
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<td>9/27, 10/2</td>
<td>Brain: Geography &amp; Networks</td>
<td>E&amp;D: Chpt 2</td>
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<td>10/4, 10/9</td>
<td>Neural plasticity</td>
<td>E&amp;D: Chpt 4</td>
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<td><strong>10/11</strong></td>
<td><strong>Exam</strong></td>
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<td>10/16, 10/18</td>
<td>Seeing</td>
<td>E&amp;D: Chpt 5</td>
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<td>10/23, 10/25</td>
<td>Attention &amp; awareness</td>
<td>E&amp;D: Chpt 8</td>
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<td>10/30, 11/1</td>
<td>Memory &amp; Learning</td>
<td>E&amp;D: Chpt 9</td>
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<td>11/6, 11/8</td>
<td>Decision Making</td>
<td>E&amp;D: Chpt 12</td>
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<td><strong>11/13</strong></td>
<td><strong>Exam</strong></td>
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<td>11/15, 11/20</td>
<td>Emotions</td>
<td>E&amp;D: Chpt 13</td>
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<td>11/27, 11/29</td>
<td>Reward systems</td>
<td>E&amp;D: Chpt 14</td>
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<td>12/4, 12/6</td>
<td>Cognition in social context</td>
<td>E&amp;D: Chpt 15</td>
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<td>12/11</td>
<td>Disorders</td>
<td>E&amp;D: Chpt 16</td>
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<td><strong>TBD</strong></td>
<td>Date &amp; Location TBA</td>
<td><strong>Exam</strong></td>
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Notes: Sept 6 & 251 are Brandeis Mondays  No class Tuesday, Sept 11. Thanksgiving break: Nov 21-23.
7 How about makeup exams?

Makeup exams will be given only with prior agreement from the instructor; for equity’s sake there can be no exceptions. Also, if a medical condition is the cause for the requested makeup exam, a physician’s written documentation of a serious medical condition must be provided.

8 Staff for the course

8.1 The instructor (me)

My office is Volen Center, Room 242, and my e-mail address is mailto:vision@brandeis.edu. Incidentally, I really prefer that email messages get right to the point. My regular office hours are Tuesday, 3 to 4:30 p.m, and also by appointment. Do drop by, even if only to say hello, chat, or discuss pretty much anything, including the course content, the meaning of life, the joys of bike riding, etc. My lab’s homepage is http://people.brandeis.edu/~sekuler/.

8.2 Course assistants

This semester, cogNeuro has not one, but two outstanding graduate teaching assistants, Dina Soliman (Psychology) and Daniel Svedberg (Neuroscience). Their e-mail addresses are mailto:dinasoliman@brandeis.edu and mailto:dsvedberg@brandeis.edu. Additionally, we are fortunate to have the services of a terrific undergraduate BUGS tutor, Rachel Sussman mailto:rfreedsussman@brandeis.edu. The location and times of their office hours will be announced in class.

9 Accommodations for disability

In every course at Brandeis University, any student with a diagnosed disability should alert the course’s instructor as soon possible to special needs that arise from that disability, and provide documentation of the disability. NPsy 22 is no exception to this rule.
10 Academic honesty

Every member of Brandeis’ academic community is expected to maintain the highest standards of academic honesty. Anyone who does not conform to the University’s expectations faces serious penalties, including failure on an assignment, failure in the course, suspension from the University, or worse. This is a serious matter. You can find the University’s policy on academic integrity in the *Rights and Responsibilities Handbook.*