Syllabus & Course Information
Learning & Memory: Mechanisms & Pathologies (MEDS4026)

Course Director:
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Class Meetings:
Class meets from 2:00pm to 3:20pm on Tuesdays and Thursdays in Swift 616.

Objectives & Topics: One of the main objectives of the course will be to instill in the student a sense of the fascinating examples, the interesting questions they engender, and the exciting answers that pervade the modern field of neuroscience. Primary attention will be devoted to our understanding of the processes of learning and memory. Students should gain an appreciation for the role of “pathology as the great teacher.”

Active learning is an important part of the student experience and, to that end, the course will be highly interactive. Students will be expected to come to class prepared to contribute to discussion of the topic under consideration and to ask and answer questions. During some weeks students will be divided into groups and each group will be expected to teach the rest of the about a specific topic or reading selection.

Among the topics to be presented will be:
• The Jennifer Aniston neuron, a single cell that responds only to pictures of Jen. What do such ‘concept cells’ tell us about the building blocks of declarative memory?
• Eidetikers – The Human Camera and other dramatic examples of individuals with photographic memories. How does it work and what are the pros & cons of having one?
• Alzheimer’s and Mad Cow Diseases – What do they have in common and what can they teach us about how memory works?
- Synesthesia: musical notes with color and words that have flavors – mixing the senses through neuroanatomy.
- The Lost Mariner – a study in memory loss with a discrete biochemical basis.
- Effective versus ineffective ways to study – what does science have to say?
- Animal learning – how simple can a system be and still be able to learn & remember?
- New tools for answering old questions about memory & learning – Brainbow, Clarity, Optogenetics and more.

Readings: There is no required textbook, but there will be assigned readings of primary and review papers. These will typically be posted on Blackboard. Lectures may be accompanied by Powerpoint presentations and these will also be posted on Blackboard. In some cases there are excellent websites online devoted to the topics that will be covered in class and students are expected to utilize these resources as part of the active learning experience.

Active Learning: Active learning is an essential component of this course. This will take the form of in-class discussions, weekly reflective essays, and student-led teaching exercises. One group project and one individual term paper will be assigned. No written exams are planned (unless the in-class discussions prove inadequate).

- The purpose of the reflective essays is to encourage the student to think independently and deeply about some aspect of the weekly topic that has been presented in class.
- Reflective essays are to be submitted via Blackboard and are due no later than 9:00 AM on Monday of the following week.
- The length of the essay should be in the range of one typed page, single spaced, normal size font. In addition to its content, the essay will be graded on clarity of expression. This is in accord with the concept of writing across the curriculum. Each essay will be graded on a scale of 1-10 points.
- In addition to being thoughtful, the essays should be clearly and carefully written. Style counts! If a reflective essay is poorly written (e.g. has substantial grammatical or spelling errors, is lacking in clarity, etc.) the student will be notified that the grade is conditional on receipt of a corrected version within one week or the score for that essay will convert to zero.
**Grading Policy:** Because this syllabus should be considered a living document rather than being graven in stone, changes may be made to the lecture schedule as well as to the grading policy as the term progresses. This will permit building on activities that are proving successful or to making corrections to those that are not.

The approximate weights given to each of the assessment modalities will be:

- Weekly reflective essays & teaching exercises: 40%
- Contribution to in-class discussion: 20%
- Group project: 20%
- Individual term paper: 20%

The grading scale for the entire course will be:

- 90% to 100%   A/A-
- 80% to 89%    B+/B/B-
- 70%-79%        C+/C/C-
- 60% to 69%    D/D-
- <50%            F

On occasion the ranges may be extended to account for natural breaks in the distribution of scores or to compensate for significant variations in the difficulty of the grading on individual assessment components. In no case will a student’s grade be decreased based on the above scale.

The various assignments and discussions are designed so that scores will result in grades as follows:

A grade of **A** reflects a full understanding of the factual material presented, with a good ability to use the information creatively to solve problems. Scores of 90% or above will receive A or A- grades.

A grade of **B** reflects a significant understanding of the factual material presented, with a reasonable ability to use the information creatively to solve problems. Scores of 80% to 89% will receive B-, B or B+ grades.
A grade of C reflects an adequate understanding of the factual material presented, but with a limited ability to use the information creatively to solve problems. In general, scores of 70% to 79% will receive C grades.

Any student who accumulates less that 50% of the possible points on the combined assessments will receive a grade of F.