

**Neurobiology of Disease (& Brain Dysfunction)**  
**Spring 2011**  
**Tues/Thurs 9:30-10:45am**  
**Instructor: Rebecca Spencer, PhD**  
**Office hrs: Wednesdays 9-10am (Tobin 419)**

**This is a technology-free classroom (no cell phones or laptops – unless you're presenting or sharing something with the class).**

**Course description:** This 3-credit seminar is designed to acquaint students with the symptoms, pathophysiology, etiology, and treatment of various neurological and neuropsychiatric disorders. We will walk through a selection of diseases and consider what it is at a behavioral and neurobiological level, how it's diagnosed, and how it's treated.

Jan 24	Welcome (course organization, etc)	Spencer
Jan 26	Intro to neurology & neuropathology	Spencer
Jan 31	Intro to Anatomy (via Stroke)	Spencer
Feb 2	ADHD	Spencer
Feb 7	Schizophrenia I	Spencer
Feb 9	Schizophrenia II	Spencer
Feb 14	PTSD I	Spencer
Feb 16	Mood and anxiety disorders	Spencer
Feb 21	TBI	Spencer
Feb 22 (4pm)	NSB colloquia: Ann McKee Lecture	McKee
Feb 23	No class (replaced with 2/20 lecture)*	
Feb 28	Addiction I	Spencer
Mar 1	Addiction II	Spencer
Mar 6	Autism	Spencer
Mar 8	Sleep disorders	Spencer
Mar 12 (7pm)	Amherst Cinema: Eternal Sunshine viewing and discussion	Harrington
Mar 13	No class (replaced with 3/12 viewing and lecture)*	
Mar 15	ALS	Spencer
Mar 20	Spring break	
Mar 22	Spring break	
Mar 27	[Grant reviews]	
Mar 29	[Grant reviews]	
Apr 3	Drug development	Chambers
Apr 5	Parkinson & Huntington disease I	Spencer
Apr 10	Parkinson & Huntington disease II	Spencer
Apr 12	Cerebellar ataxia	Spencer
Apr 17	No class (Monday schedule)	
Apr 19	Alzheimer disease I	Spencer
Apr 24	Alzheimer disease II	Spencer
Apr 26	Health disparities	Spencer
May 1	Health disparities	Spencer

\*Should you have conflicts with these alternate meeting times, please see me at least 10 days in advance for a replacement assignment

**All assignments and reading are posted at the class website:**

<http://cognaclab.com/wp/?p=373>

## Requirements and evaluation

You have an A in this class! It is up to you to keep it by doing these things:

1. Come to class.
2. Do the reading and be ready to talk about it.
3. Participate in class.
4. Do your assignments.

Pretty easy, huh? Below, I expand on these steps.

**ATTENDANCE:** I expect you to attend all classes – that is the basis for meeting the course objectives. Any unexcused absences will result in a lowering of your grade.

**TARDINESS/LEAVING CLASS EARLY:** It is very distracting to have students come to class late and/or leave early. Therefore, please make every effort to be here on time. If you have to leave early, let me know at the beginning of the class period. If you know that you will be late or will leave early regularly, please discuss this with me.

**PARTICIPATION (30%):** Participation is very important to the success of this class. An important component to active participation is knowledge of what is being discussed – this is the purpose of the assigned readings. To facilitate this, I require that you write **two** questions for each class's readings. These questions will be used to aid in class discussion. These questions, your reading journal, and your participation in in-class activities will count for **40%** of your final grade.

*READING QUESTIONS/JOURNAL (30%):* This class requires a notebook/journal (or choice on size/format). Please purchase one to dedicate to this class. You will need to prepare two questions based on the readings for every class for which there is assigned reading. These questions could also be points that you found interesting and would like to discuss further in our class. These questions must indicate engagement with the readings. You should also write a brief summary and thoughts on paper (perhaps it inspires research ideas) in the journal.

**GRANT PROPOSAL (40%):** Your semester-long assignment is to prepare an NIH grant proposal following the instructions for an NIH "Exploratory/Developmental Grant Proposal," termed an "R21" (see below). The proposal should be on a topic of relevance to the neurobiology of brain disorders. Details are provided at the end of this document.

**LATE ASSIGNMENTS** will not be accepted except under extenuating conditions. If you can not make a deadline, we must discuss a reason and

**PLAIGARISM:** If you do not know it, please familiarize yourself with the University's Academic Honesty Policy found here: [http://www.umass.edu/dean\\_students/codeofconduct/acadhonesty/](http://www.umass.edu/dean_students/codeofconduct/acadhonesty/)

### GRADING

Your final grade will be computed the following way:

Participation in-class: 30%

Reading Journal/Questions and other class assignments: 30%

Research Proposal: 40%

At the end of the semester, your final grade will be assigned as follows:

A	93 and above	B+	87-89	C+	77-79	D	60-69
A-	90-92	B	83-86	C	73-76	F	59 and below
		B-	80-82	C-	70-72		

## Grant Proposal Assignment

**TOPIC:** The focus of your R21 application should be relevant to the course content, i.e., pertain to the neurobiology of brain dysfunction. However, you can select where on the basic-clinical continuum it falls. More important is that it deals with a topic in which you are interested.

**CONTENT:** Please submit these three documents (all due electronically):

- a. An NIH Biosketch using the form and instructions available on the NIH web site.
- b. Specific Aims in NIH format
- c. Research Strategy: 6-pages per NIH guidelines for R21
- d. Bibliography (no page limit).

**ADVICE:** Some general advice in preparing a research proposal:

a. It is best to have a strong hypothesis to guide you and your reviewer. Your task then will be to propose experiments to test (not prove!) your hypothesis.

b. It is often helpful to cite some preliminary data in preparing a research proposal. Such data can help to indicate the feasibility of the proposed project and/or the strength of your hypothesis. You may use data that you have collected or data collected by others (published or not). However, you must indicate the source of your data. Do not under any circumstances fabricate data unless you clearly indicate that your data are hypothetical.

c. Justify your statements with references, generally using peer-reviewed research articles rather than (or in addition to) research articles.

d. Follow the instructions carefully. Proposals are often rejected because of a failure to do so.

**PROPOSAL REVIEW:** You are also required to review two proposals submitted by others attending this course. Instructions will be provided.

**DEADLINES:**

February 9: Proposal summary (1 paragraph) due. This could be a preliminary Specific Aims page. Importantly, your topic and general strategy/approach should be clearly thought through.

March 23: Full draft due.

March 24-April 2: You will review 2 proposals from your colleagues

April 2: Grant reviews due

May 1: Final grant due

**Instructions continue on next page....**

<b>Margins at least 0.5 inches on all four sides.</b> <b>Recommended type face: Arial, 11 pt</b>	
<b>1. Specific Aim</b>	<p>State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved.</p> <p>List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology.</p> <p><b>Specific Aims are limited to 1 single-spaced page. Margins, typeface as above.</b></p>
<b>2. Research Strategy</b>	<p>Organize the Research Strategy in the specified order and using the instructions provided below, which also represent the categories in which your proposal will be evaluated. Start each section with the appropriate heading. Cite published experimental details and provide the full reference in the "Bibliography and References Cited" section (not part of the 6-page limit). <b>The section is limited to 6 single-spaced pages for text and figures, with margins and typeface as above.</b> (It is best to use of all this space.) The section should be organized as follows:</p> <p>(a) Significance (typically 0.5- 1.0 page)</p> <ul style="list-style-type: none"> <li>• Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.</li> <li>• Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.</li> <li>• Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.</li> </ul> <p>(b) Innovation (typically 0.5-1.0 page)</p> <ul style="list-style-type: none"> <li>• Explain how the application challenges and seeks to shift current research or clinical practice paradigms.</li> <li>• Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage over existing methodologies, instrumentation, or interventions.</li> <li>• Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions.</li> </ul> <p>(c) Approach (typically 4-5 pages)</p> <ul style="list-style-type: none"> <li>• Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate.</li> <li>• Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.</li> <li>• If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.</li> <li>• Point any procedures, situations, or materials that may be hazardous to personnel and precautions to be exercised.</li> </ul>
<b>3. Bibliography</b>	Any standard format is fine. I tend to NOT use APA but reference with numbers in text (takes less space).
<b>4. Biosketch</b>	Please follow this template: <a href="http://grants.nih.gov/grants/funding/2590/biosketchsample.pdf">http://grants.nih.gov/grants/funding/2590/biosketchsample.pdf</a>