Instructor: Tony Nunez
Office: 102 Giltner Hall or 230B Chittenden Hall (by appointment); e-mail: nunez@msu.edu; voice mail: 355-0301.
Time: Mondays and Wednesdays, 3:00 pm to 4:20 pm
Place: 121 Baker Hall

Readings:
Course Content: Original Papers/Reviews: Sets 1-3 and target articles.

Grades: In-Class Exams (60%), proposal (20%), target articles discussions (10%), specific aims data blitz (10%).

Learning Objectives: (1) to become familiar with the conceptual foundations and current research in selected domains of behavioral neuroscience (2) to develop skills in oral and written communication (3) to develop skills for the critical reading of scientific research (4) to develop grant writing skills

Course outline:

The core of the course includes three thematic units. Each unit starts with a historical overview and includes reading of review articles and class discussion of key research papers. There will be three in-class exams, each one covering the content of one of the three units; the exams will not be cumulative. There will be no questions taken directly from the specific content of the target articles.

Unit One: Learning and Memory: Set 1 January 6th – 29th (No class Monday 1/20; MLK day)

Unit One Target Articles Discussions: January 22nd and January 27th
Selections for Unit One are due January 15
February 3: In-class exam for Unit One (20%)

Unit Two: Sleep & Rhythms: Set 2 February 5th – 26th

Unit Two Target Articles Discussions: February 17th and February 24th
Selections for Unit Two are due February 10th

March 2 – 6: Spring Break

March 9: In-class exam for Unit Two (20%)

Unit Three: Reproduction in Context: Set 3 March 11th – April 8th (No class March 25; NPA meeting in San Diego).

The background reading for this unit should cover textbook chapters on feeding behavior/energy balance as well as reproduction.

Unit Three Target Articles Discussions: March 30th and April 1st
Selections for Unit Three are due March 23rd

April 8: In-class exam for Unit Three (20%)

Pre-doctoral Grant Proposal: Due Tuesday of finals Week (April 27th)

Proposal Outline and Page Limits:

**Research and Professional Experience (as a narrative, not just a set of bullets):** What have you done to prepare for a career in science/research? What is the topic of your dissertation or current project? Include a list of publications/conference presentations and awards (2-page limit*).

**Sponsor/Institution:** Why do you want to work with the sponsoring investigator? What is ideal about the selected laboratory and institution? The sponsor may be a scientist from MSU, but your proposal may also identify a sponsor from another institution (2-page limit).
**Research Approach:** This section should include a brief review of the literature, a set of specific aims, and a description of experiments to achieve those specific aims. The proposal should include work to be completed in three years. The proposed research may be related (but not identical) to your current research project or to work done in previous laboratory rotations. Aim to present the research plan as hypotheses-driven, rather than as descriptive or exploratory; see articles by McPherson and by Fudge at the end of this section (5-page limit).

*The research approach must include a discussion of how the proposed training and research activities relate to the field of Behavioral Neuroscience (broadly defined).*

**Literature Cited:** Provide a complete list of the papers cited in the proposal with full bibliographical information (no page limit; no prescribed format as long as the references can be retrieved with the information provided).

**Training Potential:** Explain how the proposed research will complement your current and past training. Describe any activity (e.g., seminars, workshops, short-courses) during the three years of support that will add to the training potential of the research experience. An important component of this section is to describe training plans in areas related to the responsible conduct of research and research ethics. Consider framing this section as an individual development plan (2-page limit).

**Broader Impact:** Explain the significance of this research and training plan in the context of current challenges faced in important domains such as human health, conservation, climate change and economic sustainability. What is innovative about the research and training plan? (1-page limit).

*All page limits are for single-spaced format 12-point font*

**Articles to Read Before Framing your Proposal:**


**Target Articles (Selected by Participants) Discussions:**

In addition to the regular readings, there will be two or three target articles for discussion for each
of the three units. There are some suggestions given here (see below), but each participant is free to select a paper to present with content related to the general theme of the Unit. All of us will read the selected articles, but the class participant making the selection will be responsible for leading a structured discussion of the target article. The length of the presentation should be 20 – 25 minutes. For each paper, the individual responsible for its content will prepare a discussion/presentation that will cover the following:

(1) An explanation of the rationale, method and major findings of the article, including supplemental materials associated with the publication. When preparing this section, assume that the rest of the class has read the paper once, but not as carefully as you did.

(2) A discussion of how the material of the article relates to the rest of the content of the pertinent unit (challenges, contradictions, confirmations of perspectives presented in class and/or the assigned readings).

(3) A summary of the accomplishments and significance of the article’s content that would be accessible and interesting to the general public.

Unless there is attrition in the number of students, each class participant will be responsible for one target article selection and discussion.

<table>
<thead>
<tr>
<th>SUGESTED TARGET ARTICLES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNIT ONE:</strong></td>
</tr>
<tr>
<td><strong>UNIT TWO:</strong></td>
</tr>
<tr>
<td>Pedersen, N.P. <em>et al.</em> (2018) Supramammillary glutamate neurons are a key node of the arousal system. <em>Nature Communications</em> 8: 1404 DOI: 10.1038/s41467-017-01004-6.</td>
</tr>
<tr>
<td><strong>UNIT THREE:</strong></td>
</tr>
<tr>
<td>Schneider, J.E. <em>et al.</em> (2017) RFamide-related peptide-3 and the trade-off between reproductive and ingestive behavior. <em>Integrative and Comparative Biology</em>, 57: 1225 –</td>
</tr>
</tbody>
</table>


**ASSIGNED READINGS**

**Unit One (January 6 – 29):**


**Unit Two (February 5 – 26):**


**Unit Three (March 11- April 8):**


---

### Specific Aims Presentations:

April 13 to April 22 (30-minute presentations with 10 minutes for discussion of the specific aims of each proposal)

Visit: [http://www.northwestern.edu/climb/resources/written-communication/index.htm](http://www.northwestern.edu/climb/resources/written-communication/index.htm)

---

### Important Dates:

#### Unit One:

January 15th Target Article Selections  
January 22nd and 27th Target Article Presentations  
February 3rd Unit One Exam

#### Unit Two:

February 10th Target Article Selections  
February 17th and 24th Target Article Presentations  
March 9th Unit Two Exam
Unit Three:

March 23\textsuperscript{rd} Target Article Selections
March 30\textsuperscript{th} and April 1\textsuperscript{st} Target Article Presentations
April 8\textsuperscript{th} Unit Three Exam

April 13\textsuperscript{th}, 15\textsuperscript{th}, 20\textsuperscript{th} and 22\textsuperscript{nd} Specific Aims Presentations

April 27\textsuperscript{th} Written Proposal Due at 5:00 pm