BIOL 447/PSYC 447
Seminar in Neuroscience

Course: BIOL 447/PSYC 447
Semester: Spring 2021
Faculty Instructor: Dr. Chris Korey
Course Location: RITA 275
Meeting Time: M, 12-3:00 pm
Office Hours: By Appointment

Email: koreyc@cofc.edu
Phone: 843-953-7178

Seminar in Neuroscience
Our Classroom is an Inclusive Community

This course will provide equal access. I am happy to work with all students to ensure that they have equal access to the educational experience of this class. Any student eligible for and needing accommodations because of a disability is requested to speak with me during the first two weeks of class or as soon as you have been approved for services so that reasonable accommodations can be arranged - Center for Disability Services/SNAP.

Veterans and Active Duty Military: Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, disabilities) are welcome and encouraged to communicate these, in advance if possible, to the instructor.

Preferred Name and Pronoun Information: I will gladly honor your request to address you by the name and gender pronouns of your choice - mine are he/him/his. Please advise me of this early in the semester via your college-issued email account or during office hours so that I may make the appropriate notation on my class list.
Seminar in Neuroscience
Delving Into The Literature

- Continue to build upon previous experience reading scientific literature
- Reinforce scientific communication skills you have developed as a neuroscience minor
- Get a better understanding of grant proposals

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Career Exploration and Planning

- Think a little deeper about who you are and how that connects to career
- Develop a career plan or fine tune your current one
- Create some career essentials - Resume, CV, LinkedIn, Headshots
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OAKs Material

We’ll use it for:
- All Course Informational Material (Syllabus, Day by Day Detailed Course Guide)
- Course Calendar
- All Readings
- Grading Specifications for the Course and Assignments
- Pre-Class Assignments
- Supplemental Course Material
- Grade Book

Seminar in Neuroscience

Readings

- We are only using primary and secondary literature
- All readings will be available on OAKs and I’ll handout a hard copy if you like reading paper versions
- I have chosen the starting review article - you will choose our path to the next three research articles
Seminar in Neuroscience

Neuropathic Pain

The Genetics of Neuropathic Pain from Model Organisms to Clinical Application

Brain
- Inflammatory mediator release
- Glial cell activation
- Cortical remodeling
- Descending facilitation
- Descending inhibition

Spinal Cord
- Inflammatory mediator release
- Glial cell activation
- Synaptic efficacy
- Inhibitory tone

Dorsal Root Ganglia
- Excitability
- Altered gene expression
- Ectopic firing

Peripheral fibers
- Nociceptor sensitivity
- Ectopic firing
- Altered signal transmission

Neuropathic pain (NHP) arises due to injury to the somatosensory nervous system and is both common and debilitating, resulting in an urgent need for new treatments to alleviate suffering. Given its high prevalence and chronicity, investigation of nociceptive mechanisms underlying NHP has advanced our understanding of the molecular factors underlying NHP. Recent advances in the characterization of glutamate excitotoxicity in various species, such as mice, and the demonstration of its involvement in the development of chronic pain, have provided new insights into the mechanisms underlying NHP. This seminar will focus on the development of novel therapeutic strategies to alleviate the suffering of patients with NHP. Attendees will gain a deeper understanding of the molecular and cellular mechanisms underlying NHP, and explore how to apply these findings to the prevention, diagnosis, and treatment of NHP in the clinic.

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Specifications Grading

- My grading philosophy has evolved over my time as a faculty member...
- There will be clear specifications or goals for an assignment that are provided to you with the assignment
- None of your assignments will have grades attached, your assignment will receive either a “complete” or and “incomplete” based on your fulfilling the specifications
- This focuses us on reaching our knowledge goals, rather than focusing on what the difference is between an B and B- on an assignment
Seminar in Neuroscience

Final Grading and Badges

Your final grade is determined by the number of badges out of 10 you have earned during the semester.

<table>
<thead>
<tr>
<th>Badge</th>
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<tbody>
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<td>Context</td>
<td>You can demonstrate comprehension of existing knowledge and integrate new knowledge</td>
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<tr>
<td>Methods</td>
<td>You can visually illustrate scientific methods and identify critical elements of experiment or study design</td>
<td>Submit six illustrated cartoons visualizing the experimental methods for particular data that meet all grading specifications</td>
</tr>
<tr>
<td>Visualization</td>
<td></td>
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</tbody>
</table>

Overall course grade:

- 9 badges = A
- 8 badges = B
- 7 badges = C
- 6 badges = D
- 5 or fewer badges = F

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Substantial Interruption of Instruction

- If in-person classes are suspended, I will provide a detailed plan for a change in modality to ensure the continuity of learning.

- All students must have access to a computer equipped with a web camera, microphone, and Internet access. Resources are available to provide students with these essential tools.

- **Something to Think About:** Next time we’ll decide as a class how to proceed with class if a significant number of students must be remote.
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Sometimes, life happens or a pandemic happens…

I also understand that you all have other courses, life responsibilities, jobs, and families. You may test positive for SARS-CoV-2, develop COVID-19 symptoms, or have to quarantine/self-isolate. Sometimes, life just takes an unexpected turn.

However, that shouldn’t prevent you from being successful in this class. Please do not hesitate to talk to me about any personal issues (you do not have to provide specifics) that arise during the semester so that we can arrange for the assistance you may need and make reasonable accommodations for you to complete missed work.

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Detailed Course Calendar

What are important dates I should make note of in my calendar?

I maintain a comprehensive course calendar with the course topics, readings, assignments, and due dates. In the event that our schedule changes (due to weather, class cancellations, etc.), I will update the course calendar online as soon as I can. This information will also be in our OAKs course calendar.

**Syllabus Symbols:** The following symbols provide information about how the class is meeting and will be updated if changes are required due to the pandemic.

- **Normal Course Mode:** Clyde indicates the course is meeting live in-person in RITA 275 during our scheduled class time. Cloth masks that cover your nose and mouth are required to attend these sessions.

- **Course Disruption:** If the course needs to go online due to the pandemic, the Zoom Symbol will be inserted to indicate that the course is meeting live in zoom during our scheduled class period. The Zoom links will be available in OAKs.

**Pre-Class Meeting Assignments:** All assignments that are required to be completed prior to our next class meeting will always be due by Saturday at 10pm.
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Contacting Me

- Email is the best way to connect with me if you have questions that are particular to just you or course questions. I’ll answer your emails within 24 hours.
  - Weekdays - Emails sent to me after 5pm will likely be answered the next morning.
  - Weekends - Emails sent after 4pm on Friday will be answered on Sunday night or Monday morning

Seminar in Neuroscience

Honor Code and Academic Integrity

- Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students.

- A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student’s transcript for two years after which the student may petition for the XX to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

- Students should be aware that unauthorized collaboration—working together without permission—is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted.

- Students can find the complete Honor Code and all related processes in the Student Handbook
Fall 2021 BIOL/PSYC 447 Detailed Course Plan

Syllabus Symbols: The following symbols provide information about how the class is meeting and will be updated if changes are required due to the pandemic.

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Pre-Class Meeting Assignments: All assignments that are required to be completed prior to our next class meeting will always be due by Saturday at 10pm.

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<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>1/11</td>
<td>Introductions, Designing Final Syllabus</td>
</tr>
<tr>
<td>M</td>
<td>1/18</td>
<td>MLK Holiday - No Classes</td>
</tr>
</tbody>
</table>

Module One: Our first module will allow us to take a deep dive into the field of Neuropathic Pain. We’ll use a variety of pre-class assignments and collaborative in-class activities to dissect the current state of knowledge in the field. We’ll also do some initial work on how our values and strengths inform our ultimate career choices.

Module 1 - Neuropathic Pain Review Article Discussion
Calvo et al. (2019) The Genetics of Neuropathic Pain from Model Organisms to Clinical Applications

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<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Topics</th>
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</table>
| M   | 1/25 | **Research:** Class Discussion of pp 637-643  
|     |      | • **Due Before Class:** Concept Map Assignment  
|     |      | **Professional Development:** Values and Career Choice  
|     |      | • **Due Before Class:** Values Assessment |
| M   | 2/1  | **Research:** Class Discussion of pp 643-647  
|     |      | • **Due Before Class:** Concept Map Assignment  
|     |      | **Professional Development:** Strengths and Career Choice  
|     |      | • **Due Before Class:** Strengths Assessment |
**Module Two:** Our second module will facilitate a close examination of a peer-reviewed research article that we have chosen based on our discussions of the review article. We’ll use a variety of pre-class assignments and collaborative in-class activities to examine experimental approaches, hypotheses, and results. This module will end with an exploration on how we fund science in the US. Within this module, you’ll have the opportunity to build and refine your resume and a curriculum vitae.

<table>
<thead>
<tr>
<th>Date</th>
<th>Research</th>
<th>Professional Development</th>
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</thead>
</table>
| M 2/8 | **Research:** Discussion of Introduction and First Half of Results/Figures  
- **Due Before Class:** Introduction Concept Map, Figure Analysis Activity  
- **Professional Development:** Designing Resumes (Career Center) | |
| M 2/15| **Research:** Second Half of Results/Figures  
- **Due Before Class:** Figure Analysis Activity  
- **Due Before Class:** Designing Resumes  
- **Due Before Class:** Current and Aspirational Resume | |
| M 2/22| **Research:** Discussion/Future Experiments;  
- **Due Before Class:** Expand Concept Map, List of Discussion Points  
- **Due Before Class:** How Science Gets Funded in the US  
- **Due Before Class:** Grant Panel Review Criteria Ideas | |
| M 3/1 | **Research:** Grant Panel Discussion; 5 Questions for Authors  
- **Due Before Class:** Next Experiment Mini-Proposal | |

**Module Three:** Our third module will facilitate a close examination of a peer-reviewed research article that we have chosen based on our continuing discussions. We’ll use a variety of pre-class assignments and collaborative in-class activities to examine experimental approaches, hypotheses, and results. This module will end with a second exploration on how we fund science in the US. Within this module, you’ll have the opportunity to think about networking using digital tools.

<table>
<thead>
<tr>
<th>Date</th>
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<th>Professional Development</th>
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</table>
| M 3/8 | **Research:** Discussion of Introduction and First Half of Results/Figures  
- **Due Before Class:** Introduction Concept Map, Figure Analysis Activity  
- **Professional Development:** Odyssey Plans and Life Design Interviews | |
| M 3/15| **Research:** Second Half of Results/Figures  
- **Due Before Class:** Figure Analysis Activity  
- **Professional Development:** Odyssey Plans and Life Design Interviews  
- **Due Before Class:** Two Odyssey Plans | |
| M 3/22| **Research:** Discussion/Future Experiments;  
- **Due Before Class:** Expand Concept Map, List of Discussion Points  
- **Professional Development:** NIH and NSF Grant Reviewing Criteria  
- **Due Before Class:** Refine Grant Panel Criteria | |
| M 3/29| **Research:** Grant Panel Discussion; 5 Questions for Authors  
- **Due Before Class:** Next Experiment Mini-Proposal | |
**Module Four:** Our fourth module will facilitate a close examination of a peer-reviewed research article that we have chosen based on our continuing discussions. We’ll use a variety of pre-class assignments and collaborative in-class activities to examine experimental approaches, hypotheses, and results. This module will end with a larger discussion of the field based on looking back on all three articles. We’ll end by reflecting on what we have learned about the path to being a professional in science from the responses that authors may have sent us.

<table>
<thead>
<tr>
<th>Date</th>
<th>Research &amp; Professional Development</th>
</tr>
</thead>
</table>
| M 4/5 | **Research:** Discussion of Introduction and First Half of Results/Figures  
  ● **Due Before Class:** Introduction Concept Map, Figure Analysis Activity  
  **Professional Development:** Digital Networking (Career Center) |
| M 4/12 | **Research:** Second Half of Results/Figures  
  ● **Due Before Class:** Figure Analysis Activity  
  **Professional Development:** LinkedIn Profiles  
  ● **Due Before Class:** Draft LinkedIn Profile |
| M 4/19 | **Research:** Larger Discussion of the Field  
  ● **Due Before Class:** Concept Map Articles 1-3  
  **Professional Development:** Reflecting on Author Responses |
How is my final grade calculated?
As explained in the syllabus, your overall course grade is determined by how many course badges you earn during the semester. Listed below are the ten badges offered in the course, what these badges demonstrate about your learning, and what it takes to earn them.

9 badges = A
8 badges = B
7 badges = C
6 badges = D
5 or fewer badges = F

1 halfway completed badge = next highest plus grade
2+ halfway completed badges = next highest minus grade

Review the syllabus and the information provided here to devise a plan for achieving the course grade you’re aiming for. I’ll keep track of updated grades information in OAKS, but I’ve also included at the end of this handout a worksheet you can use to keep track of your grade.

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<td>Submit five annotated concepts maps of the review and three primary article introductions that meet all grading specifications</td>
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<tr>
<td>Methods Visualization</td>
<td>You can visually illustrate scientific methods and identify critical elements of experiment or study design</td>
<td>Submit six illustrated cartoons visualizing the experimental methods for particular data that meet all grading specifications</td>
</tr>
<tr>
<td>Data Annotation</td>
<td>You can apply critical reading to connect methods, figure legends, and results You can critically evaluate methods and data presentation formats</td>
<td>Submit six figure annotation activities that meet all grading specifications</td>
</tr>
<tr>
<td>Data Evaluation</td>
<td>You can examine and discuss author interpretations and claims with scientific colleagues</td>
<td>Participate in weekly in-class data discussion activities that meet all grading specifications</td>
</tr>
<tr>
<td>Experimental Design</td>
<td>You can demonstrate scientific process skills (generating hypotheses and experimental design) and synthetic thinking</td>
<td>Submit two next experiment mini-grant proposals that meet all grading specifications</td>
</tr>
</tbody>
</table>
What Are Ethos Points?
You will start the class with three ethos points, which are tokens you can use to get a 24 hour extension on assignment or resubmit within two weeks of the original due date an assignment you submitted that did not meet all expectations and was therefore graded incomplete.

How Will Plus/Minus Grade Options Be Handled?
If you recall from the syllabus, your overall course grade is based on the number of badges you complete. Nine badges equals an A, eight a B, and so on. Plus/minus grades will be determined based on the number of badges you’ve attempted, made 50% progress on or more, but haven’t fully completed. One of these types of not-yet-complete badges raises your grade to the next highest plus grade; two or more raise your grade to the next highest minus grade.

What Will This Look Like in OAKS?
I will use the Grades page in OAKS to track your progress toward each badge. Rather than earning a letter grade, each individual assignment and badge will earn a grade of either complete or incomplete. I will enter your progress toward a badge (or leave blank if unattempted) until it is complete. Your running total of ethos points will be tracked in real time. If you do not meet these specifications by midterm, I will estimate your course grade based on your progress toward badges and your remaining ethos points, and explain this estimate in feedback provided in the OAKS Grades page.
Course Badges Progress Tracker

Total number of fully earned badges:  

```
Context: Concept Map 1 __ Concept Map 2 __ Concept Map 3 __ Concept Map 4 __
         Concept Map 5 __ Concept Map 6 __ Concept Map 7 __ Concept Map 8 __
```

Methods Visualization:  
```
Exp. Cartoon 1 __ Exp. Cartoon 2 __ Exp. Cartoon 3 __
Exp. Cartoon 4 __ Exp. Cartoon 5 __ Exp. Cartoon 6 __
```

Data Annotation:  
```
Figure Analysis 1 __ Figure Analysis 2 __ Figure Analysis 3 __
Figure Analysis 4 __ Figure Analysis 5 __ Figure Analysis 6 __
```

Data Evaluation:  
```
Week 1 __ Week 2 __ Week 3 __ Week 4 __ Week 5 __ Week 6 __
Week 7 __ Week 8 __ Week 9 __ Week 10 __ Week 11 __
```

Experimental Design:  
```
Mini-Grant 1 __ Mini-Grant 2 __
```

Grant Panel:  
```
Review Criteria 1 __ Panel 1 __ Review Criteria 2 __ Panel 2 __
```

Life Exploration:  
```
Values Assessment __ Strengths Assessment __
Author Questions 1 __ Author Questions 2 __ Reflection __
```

Resume/CV:  
```
Resume __ Aspirational Resume __ CV __ Resume Peer Review __
Career Center Resume Consult __
```

Networking:  
```
LinkedIn Profile __ Life Design Interview #1 __ Life Design Interview #2 __
```

Application:  
```
Personal Statement __ One-on-One Consult __
Career Center Mock Interview __
```