BIOL 395H - HONORS RESEARCH IN BIOLOGY  
FALL 2019  
MONDAYS 2:30-4:00PM  
1378 GENOME SCIENCE BLDG. OR  
TUESDAYS 3:30-5:00PM  
202 WILSON HALL  

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TA  
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emily@live.unc.edu  
Office hours: Monday 4:30-5:30pm, 1378 GSB  

PREREQUISITES:  
BIOL 201 or 202. For Biology majors only.  

CREDIT:  
• BIOL 395H may be taken for no more than 6 graded academic credits.  
• 3 credit hours of research may be counted as one lecture course toward fulfillment of the Biology major requirements  
• 6 credit hours may be counted as one lecture course with laboratory toward fulfillment of the Biology major requirements.  

DR. HIBSHMAN’S GOALS FOR THE CLASSROOM:  
My specific goals for this semester are for you to become a more skilled and confident consumer of scientific literature and for you to improve your written and verbal communication of your own research. Our weekly seminars are a training ground to practice these skills, and as such you should feel comfortable to raise questions and accept constructive criticism from myself and your peers. We will also discuss your experiences in lab and what it is like to continue into a scientific career. We each have unique backgrounds and experiences that will shape our research interests and perspectives on science. This diversity makes for vibrant discussion and I anticipate a class in which we can engage with and learn from each other!  

HOW TO GET THE MOST OUT OF THIS COURSE  
This weekly seminar is a supplement to your independent research project. You will get the most out of these sessions if you come prepared to participate. This means reading the journal articles or practicing your presentation before class, making notes of questions/comments, and completing any assignments. When in the classroom, make sure you are prepared with any materials that have been sent to you, and most importantly come with an open mind ready to ask questions and discuss the week’s material. Participation is critical, not only for your learning, but for the rest of us to get a different perspective on the
data at hand. Students who have enjoyed and excelled at this class in the past have been ones who think of the seminar less as forced participation and more as a genuine discussion between peers.

**Sakai site**
Please make sure you can access the sakai site for the weekly seminars. We will post announcements, journal articles, assignments, and any supplemental material on the site. **It is your responsibility to stay up to date with emails and course announcements.**

**Digital etiquette:**
We understand that while not required, most students will use their computers during the weekly seminar for looking at papers, taking notes, learning how to use citation software, etc. While you may think you’re an excellent multi-tasker, research shows that your electronic usage can distract your classmates. Please try to keep your electronic usage to class-related tasks. You will learn more if you concentrate on the course while you are here, and your classmates will thank you for not impeding their ability to learn.

**Biol 395H has two components:**
1. Independent research in a unc laboratory
2. Weekly seminar meetings

The goal of both components is to prepare you for a future career in a scientific position, by combining the experience of working on your own research project with journal clubs, scientific writing, scientific presentations, and informal discussions about science and academia.

**I) Independent research goals and expectations:**

1. Carry out an independent research project in a research laboratory
   a. As a researcher, you will become more comfortable with basic and advanced research techniques as well as analyzing and discussing data
   b. Working in a laboratory with other undergraduates, graduate students, postdocs, and faculty members will also teach you to begin thinking like a scientist, developing hypotheses and finding ways to test them in an empirical manner. This problem solving process is also useful for future experiences unrelated to academia.
   c. Performing your own research in a laboratory can be extremely satisfying but also comes with its own unique challenges. “Failure” is a common occurrence and can be a hard aspect of research to adjust to. However, “failure” is inherent and valuable in the process of scientific discovery. Do not be discouraged! While certain laboratory courses can help give you the feel of research, nothing prepares you better for being a scientist than performing your own research project.

2. Communicate your research findings to a broad scientific audience
   a. First semester students will write a 10-page research paper on their research topic at the end of the semester. This paper includes an introduction, results section (if any), discussion, and materials and methods.
   b. Second semester students will create and present a scientific poster on their research progress at the end of the semester. The poster should include an abstract, background, results, conclusions, and future directions.
   c. Both of these assignments will help you learn how to make figures, cite primary literature, write scientifically, and place your research in a broader context.
II) WEEKLY SEMINAR GOALS AND EXPECTATIONS:

1. Present and participate in journal clubs on primary journal articles
   a. Learning to read, analyze, and discuss primary literature articles is invaluable to any career in the sciences. We will read both peer-reviewed and pre-print journal articles, beginning with journal clubs led by the instructor.
   b. Throughout the semester you will lead a journal club session with a group of students on an academic paper of your choosing.
   c. All students are expected to read the article and participate in class discussions.
   d. A major focus of our discussions will be coming up with future experiments and hypotheses that you think would move the science forward.

2. Give brief scientific talks on your research
   a. Being able to communicate your research findings is an essential process of academia. You will learn the tips and tricks to give a good research talk, see an example talk from the instructor, and have a chance to practice this yourself.
   b. First semester students will give a 10-20 minute chalk talk on their research.
   c. Second semester students will give a 10-20 minute PowerPoint presentation on their research.
   d. Both methods of communication come with their own strengths and weaknesses. By having experience with both you will be prepared to give any kind of talk required in the future.

3. Write and review sections of scientific papers
   a. Students will learn how to write scientifically through a variety of assignments.
   b. You will recreate an abstract for a published paper, focused on learning required components and beginning to work on distilling many research findings into a few concise conclusions.
   c. All students will write and peer-review a section of their end of semester assignment. For first semester students this is your paper introduction and for second semester students this is a poster abstract.

4. Discuss topics related to jobs in science and academia
   a. Students will have the opportunity to ask questions and discuss topics related to the process of doing research, publishing, graduate school, and career paths through academia.

Grading:
The grades will be assigned by the research advisor (PI) and the biology faculty sponsor (when applicable). Grades will be assigned based on evaluation of the research paper/poster and the performance in the lab throughout the semester.
**Schedule:**

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<tr>
<th>Date</th>
<th>Seminar topic/activity</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>Aug 27th</td>
<td>Introduction to the Course</td>
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<tr>
<td>Sept 3rd</td>
<td>Instructor-led peer reviewed journal club</td>
<td>Guided reading questions</td>
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<td>Sept 10th</td>
<td>Instructor-led pre-print journal club</td>
<td>Write abstract for the pre-print</td>
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<td>Sept 17th</td>
<td>Group review and discussion of student-written abstracts</td>
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<td>Literature Search Workshop</td>
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<td>Sept 24th</td>
<td>Student-led paper #1</td>
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<td>Oct 1st</td>
<td>Student-led paper #2</td>
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<td>Oct 8th</td>
<td>Student-led paper #3</td>
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<td>Oct 15th</td>
<td>Student-led paper #4</td>
<td>Begin to fill out Presentation Questionnaire</td>
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<td>Oct 22nd</td>
<td>Student-led paper #5</td>
<td><strong>Turn in abstract/intro</strong></td>
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<td>Oct 29th</td>
<td>Group review of student writing samples</td>
<td>Work on draft of your paper/poster</td>
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<td>Figure making workshop</td>
<td>Turn in Presentation Questionnaire</td>
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<td>Nov 5th</td>
<td>Group work on paper/poster</td>
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<td>Nov 12th</td>
<td>How to give a PowerPoint or chalk talk presentation</td>
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<td>Nov 19th</td>
<td>Student presentations</td>
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<td>Nov 26th</td>
<td>Student presentations</td>
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*THE PROFESSOR RESERVES THE RIGHT TO MAKE CHANGES TO THE SYLLABUS. THESE CHANGES WILL BE ANNOUNCED AS EARLY AS POSSIBLE.*