Biology 399:
Capstone in Biological Science
Fall 2017

Instructor: Dr. Roberto Brenes
Office: Rankin 304B
Phone: (262) 951 3295
Office Hours: M, W, F 10:00 to 11:00 am or by appointment*
Email: rbrenes@carrollu.edu

General Information
Class meeting time: 1:20 p.m. – 3:50 p.m. on Mondays
Location: RK 204A
This is a hybrid course with 2.5 hours of face-to-face class time and
2 hours of on-line instruction, plus additional work time out of class.

Capstone in Biological Science 4 credits
This course allows students to synthesize their understanding of biology through exploration of
contemporary issues in biology across multiple biological scales. Students will also explore case
studies related to ethical practice in science and develop skills necessary to transition to future
careers in biology. Prerequisites: BIO 225 (beginning spring 2013) and at least junior standing.

Course Objectives: By the end of this course, students should be able to:
• Integrate and synthesize biological information relevant to a contemporary issue, across
  multiple levels of biological analysis to create original insights (assessed via Biology Integration Assignments, Oral Exam)
• Conduct library research for pertinent supportive evidence related to such an issue
  (assessed via Biology Integration Assignments)
• Effectively present scientific information related to such an issue (assessed via Biology Integration Assignments, oral exam)
• Articulate a set of personally-appropriate career options in the biological sciences and
  outline an individual development plan to work toward such career goals (assessed via
  Career Development Assignments)
• Prepare a formal resume and demonstrate interviewing skills appropriate for applying for a
  biology-related career or graduate program (assessed via Career Development Assignments)
• Analyze research-based case studies to identify potential ethical concerns and develop an
  appropriate course of action to avoid ethical lapses (assessed via Ethics Assignments)
• Demonstrate effective time management, organizational, and team skills (Assessed
  throughout course)

Grading
Attendance (see policy outlined below) and participation in all classes is expected. As can be seen
from the point breakdown below, your grade in this class will also be based upon the successful
completion of all assignments on time. Late assignments will be penalized 10% per day late. The
grading scale in the table will determine grades.
Attendance (mandatory; potential loss of points): Attendance will be taken at every class meeting. Each student may be absent two times (for whatever reason). A student will lose 50 points (5% of a student’s total possible points) for each absence beyond the two permitted. There will be no exceptions to the attendance rule. If, for any reason, a student is unable to attend class, she/he should email the instructor as soon as possible and explain why she/he was unable to attend. The instructor reserves the right to waive a student absence under certain circumstances (faculty judgment).

Point Distribution:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Item/ Assignment</th>
<th>Point Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethics</td>
<td>Research review board</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>“Ask the Ethicist” Assignment</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Ethics debate</td>
<td>30</td>
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<td></td>
<td>Plagiarism</td>
<td>10</td>
</tr>
<tr>
<td>Biological</td>
<td>Proposal</td>
<td>20</td>
</tr>
<tr>
<td>Integration</td>
<td>Proposal presentation</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Wiki</td>
<td>30</td>
</tr>
<tr>
<td>Career Development</td>
<td>Resume and letter of intent</td>
<td>10</td>
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<td></td>
<td>Career Development Plan</td>
<td>10</td>
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<td>Mock Interview</td>
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<td>Elevator Speech</td>
<td>10</td>
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<td>Cross-Unit</td>
<td>Contribution to paper discussions</td>
<td>15</td>
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<td></td>
<td>Oral Exam</td>
<td>20</td>
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<td>Total</td>
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<td>200</td>
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Grade Assignment:

<table>
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<tr>
<th>Letter Grade</th>
<th>Percentage</th>
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<tr>
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<td>91+</td>
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<tr>
<td>AB</td>
<td>89-90.9</td>
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<tr>
<td>B</td>
<td>81-88.9</td>
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<tr>
<td>BC</td>
<td>79-80.9</td>
</tr>
<tr>
<td>C</td>
<td>70-78.9</td>
</tr>
<tr>
<td>D</td>
<td>60-69.9</td>
</tr>
<tr>
<td>F</td>
<td>&lt;61%</td>
</tr>
</tbody>
</table>

Incompletes: Incompletes will only be considered in cases of unusual circumstances. No Incompletes will be considered in this course unless arrangements have been made with the Instructor. In most cases, the highest grade that a student taking an incomplete may receive is a "B".

Students with documented disabilities who may need accommodation or any student considering obtaining documentation should make an appointment with Ms. Marty Bledsoe, Director of Services for Students with Disabilities, no later than the first week of class. She can be reached by calling 524-7335 or contacting her via e-mail at mbledsoe@carrollu.edu.
Plagiarism and Academic Dishonesty

Plagiarism is using someone else’s ideas or work and presenting it as your own ideas or work. Plagiarism – in any form – will not be tolerated in this course. For this course the sanction imposed by the instructor on a student who plagiarizes will be 0 points for the assignment for the first offense and automatic failure of the course for the second offense. If you copy more than three or four consecutive words from an author, then you are plagiarizing that author (whether or not you cite the source). Under most circumstances, I will want everything to be written in your own words – direct quotes may only be used with direct permission from me.

To avoid plagiarizing an author, read the author’s writing, step away and reflect on the writing for several moments, and then paraphrase it using your own words. After you reread your writing and the author’s writing, if there are more than a few words alike in a sentence, then you should find another way to convey the idea in your own words. If there is any question in a student’s mind whether she/he might be inadvertently plagiarizing an author’s work, then the student should contact the instructor and ask for clarification for that particular instance. The penalties for plagiarism are severe, and no exceptions will be granted to any student who plagiarizes.

Other forms of academic dishonesty (e.g., lying, preventing other students from accessing resources, etc.) are also of particular concern in this course. Any potential infractions will be reviewed by the Biology faculty, who will also decide upon appropriate sanctions. For more information on Carroll University’s policy and procedures on plagiarism and student academic integrity, see the Student Handbook.

Major Course Assignments

Biological Integration Assignments:

Over the course of the semester, you will investigate a biological issue with contemporary relevance (e.g.: The ecological dead zone in the Gulf of Mexico; infectious diseases outbreaks in central Africa, etc.). Your goal is to analyze contributions to our understanding of this issue that come from cellular/molecular research, organismal research, and ecological research. As a group you will choose and in-depth research a topic. This topic will be presented as a wiki project summarizing your main findings. During the semester, you will work in teams with people who have diverse interests in biology to help develop your understanding of how the various levels of biological analysis interact and support one another.

Proposal: As a group you will select a topic and develop a proposal of the focus of your project, this proposal will be evaluated by a group of your peers and presented to the class for final approval.

Wiki Project: Once the proposal have been approved by your peers, you and your team will create a wiki that: 1) summarizes the issue you have selected, and 2) synthesizes contributions from the literature from diverse levels of biological organization (e.g., cellular/molecular, organismal, ecological research conducted in the past 10 years). Your wiki should include a literature cited page and you should use appropriate citations throughout. Note that a synthesis is different from a summary. You should review the literature relevant at each level of organization, assess the strengths and weaknesses of the studies (individually and collectively) and report on how this area
of biology contributes to our understanding of the issue. As a collaborative project, each member of the group will be assessed based on their contributions to the project as well as their contributions to the formatting and editing of the wiki itself. More details will be provided in class.

**Wiki Summary:** A key component of the wiki assignment will be to synthesize the various types of research you have summarized to develop your own, original insights into the issue you are analyzing. This component of the wiki will be completed independently, but each of you should have the support of your group members.

**Ethics Assignments:**

**Contributions to Ethics Discussions:**
We will use the discussion forum on MyCourses to discuss a number of readings and issues related to the ethics of biology and biology research (including undergraduate student research). You will be evaluated on both the frequency and quality of your contributions to these forums. More information will be provided during the semester.

**Research review board :**
You will research the procedures to conduct research in Carroll and complete the modules required. More information will be provided by your instructor.

**Ethics Case Study:**

**“Ask the Ethicist” Assignment:** Each of you will receive and respond to an ethical question posed by a fictitious researcher. The question will come with some suggested readings, which you may reference in your response (you must reference at least three readings; they do not have to come from the suggested readings list). Your response should be at least 1200 words long, and you should articulate: 1) the ethical issue(s) that are central to the question, 2) the best course of action for the researcher, and 3) strategies that might have been effective in avoiding the issue in the first place. Remember that ethical issues are not cut and dried. The intent of the assignment is to explore and fully develop responses, not to give simplistic explanations like “they should have had better communication.” Your response will be evaluated by both the instructor and another student.

**Ethical debate:** To better understand the most current ethical issues affecting not just our country but the entire world, you will choose a current topic (list of topics will be given by the instructor) and assigned a standpoint (i.e. pro or against). In a debate in class you will defend your point using current literature and media information. The debate will be evaluated by a random group of your peers. Assignment will be done in groups.

**Career Preparation Assignments:**

**Individual Development Plan:** Modified from the Medical College of Wisconsin’s Virtual Career Center, with my changes in [brackets]:

“The IDP maps out the general path you want to take and helps match skills and strengths to your career choices. It is a changing document, since needs and goals will almost certainly evolve over time as [undergraduate and recent graduate]. The aim is to build upon current strengths and skills by identifying areas for development and providing a way to address these. The specific objectives of a typical IDP are to:

- Establish effective dates for the duration of your [undergraduate program].
• Identify specific skills and strengths that you need to develop (based on discussions with your mentor).
• Define the approaches to obtain the specific skills and strengths (e.g., courses, technical skills, [research], and supervision) together with anticipated time frames.
• Discuss your draft IDP with your mentor[/advisor].
• Revise the IDP as appropriate.”

Using the resources of the virtual career center, (http://www.mcw.edu/VirtualCareerCenter.htm), map out an Individual Development Plan for the career you are most likely to pursue. This should include a description of the career, an assessment of the skills you have and those you need to develop to be successful in that career, and a plan for how you will develop those skills over the next 1-3 years. You should discuss the plan with your academic advisor or with another mentor (approved in advance) and have that person sign the final version of the plan.

Draft and Final Resume: To assist with your career or graduate school preparation, you will prepare a resume that will be reviewed by peers, your advisor or mentor, and the staff of the Carroll career center. More details will be discussed in class.

Mock Interview Self Evaluation: Each of you will participate in a 20-minute mock interview, as if you were interviewing for a job or graduate/professional school placement. Following the interview, you will write a 1 page self-evaluation of your interviewing strengths and the areas in which you need to improve.

Elevator speech: Using the resources on the Medical College of Wisconsin's virtual career center, prepare an “Elevator Speech” and turn in a written draft in class. http://www.mcw.edu/VirtualCareerCenter/JobSearchPlan/CoreMessageStatementElevatorPitch.htm
You will use this elevator speech during your oral exam.

Exam:
Oral Exam: The final exam for the course will be a 20 minute oral exam on a Saturday at the end of the semester (exact date and time TBA). The exam will be in three parts. First, you will introduce yourself using your prepared (and memorized) elevator speech, then you will explain your wiki project to the examiner and s/he will ask you some questions about the project. Second, you and the examiner will discuss your career development plan. Finally, the examiner will ask you about various topics or issues in Biology. You should not bring any notecards or other materials to the oral exam. Oral exams will not be able to be rescheduled.