BIOL 203 – 1 & 2: Principles of Ecology

203-1 | Tuesday/Thursday | 10:00-11:15 AM | Fraser 114
203-2 | Tuesday/Thursday | 11:30 AM-12:45 PM | Fraser 202A

What is this course about?

This might be one of your first biology courses, or maybe your last. Perhaps you are a fulfilling a degree requirement, or simply taking this course because you are interested in ecology. Regardless, we—the instructional team—are very excited to be working with you this semester. We have designed this course to help you continue developing your abilities to think critically, while you learn about ecology. This course is not about memorizing a bunch of facts; instead, you will develop your scientific skills as you further your knowledge of ecology.

Who will be helping you to learn?

Instructor: Dr. Suann Yang
Office: ISC 256
Email: yang@geneseo.edu
Phone: 245-5311
Office hours: Mon 1:30-2:50 PM, Tues/Thurs 2-3 PM, or by appointment

Teaching assistants: Usman Chaudhry, Alec Ritter, Jullanar Suprunchik, and Ethan Warick
We will schedule regular help sessions after the first week of classes

What will you learn?

Upon completion of this course, successful students will:

1. Be competent in fundamental ecological concepts, specifically the:
   a. dynamic interactions of organisms within and among populations of the same species,
   b. dynamic interactions between organisms of different species,
   c. dynamic aspects of energy and biogeochemical cycles,
   d. distribution patterns of living organisms,
   e. complexity of sustainable resource use by humans on Earth, and
   f. genetic and evolutionary processes that occur within populations.
2. Understand how these concepts relate to each other, particularly the implications of viewing ecological systems on different spatial scales (e.g. local versus global) and temporal scales (e.g. seconds versus generations).
3. Be familiar with the important role of quantitative skills in ecology, especially:
   a. Understanding the roles of data visualizations, statistics, and models within the processes of scientific inquiry.
   b. Developing confidence in using quantitative skills.
   c. Using quantitative skills to solve ecological problems.
4. Have practiced fundamental science skills, such as solving problems, designing experiments, working in teams, and communicating about science to diverse audiences.
What do you need for this class?

2. *A Primer in Biological Data Analysis and Visualization Using R* by Gregg Hartvigsen
3. Laptop or other internet-enabled device to use TopHat
   - 203-01 Join Code: 730561
   - 203-02 Join Code: 910487
   - Please use your Geneseo email and G# when joining
4. The following software
   - R software (free download, [https://cran.r-project.org/](https://cran.r-project.org/))
   - RStudio (free download, [https://www.rstudio.com/products/RStudio/#Desktop](https://www.rstudio.com/products/RStudio/#Desktop))
   - Microsoft Excel (free to all Geneseo students, [https://wiki.geneseo.edu/display/cit/Software+at+Geneseo](https://wiki.geneseo.edu/display/cit/Software+at+Geneseo))
5. Paper (lined or unlined) for activities in class
6. Daily access to our course Canvas site. We will post materials, such as homework and reading assignments, on our Canvas course site that will help you prepare for each class.

How will you know that you’re learning?

You will receive feedback on your progress with regular assignments, quizzes, and a final exam. Assignments are also opportunities for you to learn new concepts, and apply and integrate your understanding. We design these to be low-stakes (i.e., low point value) practice for the quizzes and final exam. In other words, we expect mistakes to be a natural part of the learning process; thus, the penalty is reduced in comparison to the quizzes and final exam. Likewise, quizzes and the final exam are cumulative to provide you with multiple opportunities to improve your understanding of difficult concepts. Quizzes and the final exam will contain a variety of question types, including multiple choice, fill-in-the-blank, and mini essay format, and ask you to recall, apply, and synthesize your knowledge.

Your grades are primarily determined by your work as an individual. In addition, a portion of your quiz grade will be determined by your work in a team. For each quiz, you will first answer questions on your own. Then, you will immediately retake the quiz with your teammates. Working with your team will benefit you, because a portion of your team effort will be added to your individual score, as follows:

Your quiz score = your initial quiz points + ½ (team retake quiz points − your team’s average initial quiz points)

The instructor reserves the right to deny any student this team quiz benefit if there is evidence that a student is not contributing fairly to the team effort. In the event of an excused absence on a quiz date, group points on the make-up quiz will be determined by taking the average of group points over the whole semester.

Please note that any challenges to any grades recorded must be made within one week of that assignment’s or quiz’s return date.
Grading scheme

<table>
<thead>
<tr>
<th>Item</th>
<th>Points</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>120</td>
<td>Homework and in class activities (see Personal Gradebook on last page for overview)</td>
</tr>
<tr>
<td>Quizzes</td>
<td>200</td>
<td>Every three weeks, mostly on Tuesdays. All quizzes are cumulative. See Personal Gradebook on last page for dates; 5 total (40 points each).</td>
</tr>
</tbody>
</table>
| Final Exam    | 80     | 203-1: Wednesday, Dec 11 (12:00-2:30 PM), Fraser 119  
203-2: Tuesday, Dec 17 (8:00-10:30 AM), Fraser 202A |
| Total         | 400    |                                                                                   |

A (372-400 points)  B+ (348-359 points)  C+ (308-319 points)  D (240-279 points)  
A- (360-371 points) B (332-347 points)  C (292-307 points)  E (239 points or less)  
B- (320-331 points) C- (280-291 points)                                                                                   |

What are your responsibilities to our learning community?

In our classroom, we are preparing you for not only other courses in the biology program, but also for your professional career. To achieve this goal, a respectful and professional environment is essential. Students, teaching assistants, and professors have communal responsibilities to maintain this respectful and professional environment. These are:

- **Making space for everyone to contribute.** Scientific innovation arises from the insights of a diverse community. The unique talents, experiences, and contributions of each individual in our class are crucial and necessary. Be ready to learn from others and be willing to teach what you can in return.

- **Preparation.** Science is a process of discovery, and we will engage in this process during every class. Be prepared to learn together actively during our class meetings. The course is designed with a workload that is typical for 3 credit classes: about 9 hours a week outside of class on average. Please bring paper and an internet-enabled device to each class, and check Canvas for announcements and documents to print out and bring to class.

- **Timeliness.** Please complete all assignments on time, especially assignments (e.g., reading, worksheets) designed to prepare you for the upcoming class period. The instructional team will also return feedback on assignments promptly, to help you monitor your learning. Late materials are not accepted for credit. You are also required to take quizzes and the final exam at the assigned times, and any unexcused absences will result in a grade of ‘0.’

- **Commitment.** Everyone will dedicate the entire class period (75 minutes) to being present and engaged in our work. Educational researchers conclude that class attendance is highly tied to success in a course. Attendance is especially critical in our course because it is logistically difficult to replicate the group work students miss when they are absent. You must inform the instructor of absences immediately by sending an email and bringing documentation if applicable. Excused absences must be made up within one week of your return to class; no make-ups are allowed for unexcused absences.

- **Focusing and minimizing distractions to others.** Everyone should promote an effective learning environment by staying on task and helping others to stay on task. Cell phones, tablets, and laptops should be used for class-related work only.

- **Communication.** Everyone is expected to check their email at least twice a day, and use email or Canvas to communicate with each other. Please make sure to set Canvas notifications to send...
you emails with updates. You can also meet with professors and teaching assistants in office hours or by appointment.

**Uphold the Student Code of Conduct.** Plagiarism and other forms of academic dishonesty (cheating, turning in another student’s work as your own) is not tolerated at SUNY Geneseo. Working with other students on individual assignments is fine, but you must each produce original written answers or code (no copying and pasting). Check with the instructional team if you are not sure where the line between collaboration and copying stands on any assignment. Evidence of plagiarism and/or academic dishonesty is grounds for a score of ‘0’ on any assignment and further action including notifying the department chair, which can result a report filed with the Dean of Students. For full details of the Student Code of Conduct, please see the Student Handbook (https://www.geneseo.edu/handbook/student-code-conduct).

**Respect copyright.** All materials used in this course, including lectures, slides, and handouts, are copyrighted. Reproduction and/or distribution of materials is prohibited without author consent. This includes, but is not limited to, transferring files to websites such as StudyBlue and Course Hero, storing old tests in sorority/fraternity test banks, and passing on assignments to friends who may take the course in the future. Be aware that UUP (Union of University Professionals, the union representing faculty on this campus) is seeking to take legal action against groups who violate copyright, and that posting or selling copies of materials to such groups may put a student in legal jeopardy.

**Are accommodations available in this class?**

For sure! SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities. Accommodations will be made for medical conditions related to pregnancy or parenting. Requests for accommodations including letters or review of existing accommodations should be directed to the Office of Disability Services in Erwin Hall 22 or disabilityservices@geneseo.edu or 585-245-5112. Students with letters of accommodations should submit a letter to each faculty member at the beginning of the semester and discuss specific arrangements. Additional information on the Office of Disability Services is available at www.geneseo.edu/dean_office/disability_services.

**A few other things to consider about this class for biology/biochemistry majors**

**Biology/Biochemistry proficiency.** Students must have a C+ or better average in their first two REQUIRED Biology lecture courses at SUNY Geneseo to remain as Biology or Biochemistry majors. For most this is Biol 117 and Biol 119 but for those accepting AP credits or transfer students it could be other combinations.

**Minimum competence requirement.** To graduate with a biology major, students must attain a grade of C- or better in all required biology courses (excluding electives). A grade of C- must be achieved in any course before it can be used as a prerequisite for another course. A student may only repeat a required biology course or related requirement once for major credit and the course must be taken at the next offering of the class. If a student does not earn at least a “C-” on the second taking of the class, she/he will not be able to complete the major.
Lecture Outline

This course is organized into six scenarios that explore current issues in ecology. In each scenario we will study several related topics, and build upon topics introduced in previous scenarios. Resources for each scenario will be organized as Modules in Canvas. Topics and dates may be adjusted during the semester; be assured that you will be informed of any changes in a timely fashion.

<table>
<thead>
<tr>
<th>SCENARIO</th>
<th>TOPICS</th>
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</table>
| **Global Change:** What are the past and current changes in the earth system, and how do they affect ecological systems? | Ecological inquiry  
| *Target dates: 8/27 - 9/12/2019*  
*Quiz 1: 9/10* | Biomes  
| | Microevolution  
| | Climates and climate change  
| | Biological diversity I |
| **Alien Invaders:** Why do some species become established in new locations, and why are they problematic? | Life history I  
| *Target dates: 9/13 - 10/1/2019*  
*Quiz 2: 10/1* | Population dynamics I  
| | Competition I  
| | Landscape dynamics I  
| | Decomposition and nutrient cycling I |
| **Omnivore’s Dilemma:** What should we eat, and why? | Plant adaptations  
| | Animal adaptations I  
| | Aquatic environments I  
| | Terrestrial environments I  
| | Decomposition and nutrient cycling II  
| | Food webs  
| | Ecosystem energetics  
| | Sustainability |
| **The Pollination Crisis:** Why are pollinators in decline, and why should we worry about them? | Mutualism  
| *Target dates: 10/25 - 10/31/2019*  
*Quiz 3: 10/22* | Predation I  
| | Competition II  
| | Behavior  
| | Landscape dynamics II |
| **Threatened Predators:** Why are predators at risk of extinction, when they have such amazing adaptations for hunting their prey? | Animal adaptations II  
| *Target dates: 11/1 - 11/14/2019*  
*Quiz 4: 11/7* | Life history II  
| | Population dynamics II  
| | Predation II  
| | Aquatic environments II  
| | Terrestrial environments II  
| | Landscape dynamics III |
| **Environmental Health:** How do environmental alterations affect living systems, including humans? | Biological diversity II  
| *Target dates: 11/15 - 12/9/2019*  
*Quiz 5: 11/26* | Community dynamics and structure  
| | Landscape dynamics IV |
**Personal gradebook**

Please print and use the table below to keep track of your grades, quiz and exam dates, and how points are allocated throughout the semester. Check that your grade on Canvas (usually updated with each quiz) matches your records. *Do note that the timing of quizzes may not necessarily correspond to the end of a lecture scenario (see previous page).*

<table>
<thead>
<tr>
<th>Date</th>
<th>Item</th>
<th>Points possible</th>
<th>Points earned by you</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/27-9/9</td>
<td>Assignments(^1)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>9/10 (Tues)</td>
<td>Quiz 1</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>9/11-9/30</td>
<td>Assignments(^2)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>10/1 (Tues)</td>
<td>Quiz 2</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>10/2-10/22</td>
<td>Assignments(^1)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>10/22 (Tues)</td>
<td>Quiz 3</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>10/23-11/6</td>
<td>Assignments(^2,3)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>11/7 (Thurs!!)</td>
<td>Quiz 4</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>11/8-11/25</td>
<td>Assignments(^1)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>11/26 (Tues)</td>
<td>Quiz 5</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>11/27-12/9</td>
<td>Assignments(^2,3)</td>
<td>20</td>
<td></td>
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<tr>
<td><strong>203-1:</strong> 12/11 (12-2:30 PM)</td>
<td>Final Exam</td>
<td>80</td>
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<tr>
<td><strong>203-2:</strong> 12/17 (8-10:30 AM)</td>
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\(^1\)These include homework assignments and activities in class, e.g., essays of varying lengths, online problem sets, worksheets, and TopHat questions. Expect to learn some basic concepts on your own, apply what we have learned in class, and use R. Note that only a subset of activities that are assigned may be graded.

\(^2\)These include the same types of homework assignments and activities in class as described in the previous category, except you will not be using R. Note that only a subset of activities that are assigned may be graded.

\(^3\)In addition to the usual types of homework assignments, you will have a bigger group assignment. The product of your group assignment will be publicly presented. Note that only a subset of activities for these assignments may be graded.