

# **General Ecology**

## **Biology 341 (Section 01, 02)**

Course schedule – Semester Spring 2018

Instructor: **Dr. Courtney Murren**

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office hours: by email appointment and 1030-1130 W (SSMB144)

Credits: 4

Class meeting time: 925-1040 (SSMB 138)

Lab time: 1:30-4:30 W (SECTION 02) OR 1-4 TH (SECTION 01) (HWEA 302) see lab syllabus

Prerequisites: BIOL111/111L; BIOL112/112L, BIOL211/BIOL211D

Co- or pre- requisites: BIOL305; MATH250

### **Instructional Objectives**

Ecology is the study of organisms' abundance, diversity, interactions with each other and the physical environment. As such the study of ecology examines questions at numerous scales from populations to communities to ecosystems. Variation in scale and habitat (e.g. marine vs. terrestrial) necessitates many techniques to test these questions. Ecology is also a quantitative discipline – modelling approaches and statistical evaluation of datasets are important components of modern ecological science. This semester we will examine these topics with a mixture of lecture, hands on activities, discussion of foundational and recent papers in the primary literature. We will practice quantitative techniques and writing in ecology as an ecological 'apprentice' professional and as a scientific communicator for broad audiences. Bring your enthusiasm – it is contagious.

### **Learning outcomes for this course include:**

- 1) understanding the influence of abiotic factors on distribution of biodiversity on Earth
- 2) evaluating the principles of biogeochemistry – interactions of organisms and physical environment
- 3) assessing the flow of energy through ecosystems – terrestrial, marine and fresh water systems
- 4) understanding growth, regulation and dynamics of populations
- 5) applying models to understand population and community growth and change
- 6) examining biodiversity through both abundance and richness
- 7) explaining scales and patterns in ecology and biodiversity
- 8) observing how species interact with each other and how these interactions change through time
- 9) appreciating the relationships between ecology and society (conservation, invasion, agriculture, ecosystem services)

- 10) understanding the contribution of observational, laboratory, theoretical and field studies to ecology
- 11) experiencing how scientists do their work including peer review, and that scientific understanding changes through time with addition of new data and discoveries

Students will develop skills including:

- 1) conducting scientific research by developing or following well described protocols and in open-ended research projects in the field, controlled growth environments and laboratory
- 2) analyzing, writing about and discussing ecological primary literature
- 3) working collaboratively with peers to design and evaluate projects, interpret results, and develop conclusions.
- 4) working with quantitative data for data presentation and analysis and to draw ecological conclusions based on the data
- 5) practice notetaking in discussion, lecture, field and laboratory settings
- 6) practice writing for professional ecological audiences and for the public
- 7) practice peer review and constructive criticism of writing, data, interpretations and conclusions

**Required textbook:** Ecology 4<sup>th</sup> edition by Bowman, Hacker, Cain (Oxford University Press, Sinauer associates is an imprint of Oxford University Press).

**Optional Textbook:** We will be reading selections from Foundations of Ecology. Leslie A. Real and James H. Brown (University of Chicago Press). This text is a re-print of classic papers in ecology with commentary. I will share the references to the original papers on OAKS – thus an optional textbook.

**Schedule of topics and assignment due dates**

| Week | Date      | Topic  | assignment                       | Readings from text                               |
|------|-----------|--|----------------------------------|--|
| 1    | Jan 9 Tu  | Introductions                                    |                                  |  |
| 1    | Jan 11 Th | What is Ecology?                                 |                                  | Ch 1 & 2   |
| 2    | Jan 16 Tu | <i>Discussion: Foundations Past and Present*</i> | Read papers on OAKS              | Population ecology section readings: Ch 6-11*    |
| 2    | Jan 18 Th | Population Ecology                               |                                  |  |
| 3    | Jan 23 Tu | Population Ecology                               |                                  |  |
| 3    | Jan 25 Th | Population Ecology                               | Modern Reading assignment 1. DUE |  |
| 4    | Jan 30 Tu | Population Ecology                               |                                  |  |
| 4    | Feb 1 Th  | <b>Exam I</b>                                    |                                  |  |
| 5    | Feb 6 Tu  | Species Interactions                             |                                  | Species Interactions section readings: Ch 12-15* |
| 5    | Feb 8 Th  | <i>Discussion: Foundations Past and Present*</i> | Read papers on OAKS              |  |
| 6    | Feb 13 Tu | Species Interactions                             |                                  |  |
| 6    | Feb 15 Th | Species Interactions                             | Modern Reading assignment 2. DUE |  |
| 7    | Feb 20 Tu | Community Ecology                                |                                  |  |

|       |           |  |                                   |   |
|-------|-----------|--|-----------------------------------|---|
| 7     | Feb 22 Th | <i>Discussion: Foundations Past and Present*</i> | Read papers on OAKS               | Community Ecology section readings: Ch 16-19* |
| 8     | Feb 27 Tu | Community Ecology                                |                                   |   |
| 8     | Mar 1 Th  | Community Ecology                                |                                   |   |
| 9     | Mar 6 Tu  | <b>Exam II</b>                                   | mid term grades due 3/7/18        |   |
| 9     | Mar 8 Th  | Community Ecology                                |                                   |   |
| 10    | Mar 13 Tu | <i>Discussion: Foundations Past and Present*</i> | Read papers on OAKS               |   |
| 10    | Mar 15 Th | Ecosystem Ecology                                | Modern Readings assignment 3. DUE | Ecosystems section readings: Ch 20-22*        |
| 11    | Mar 20 Tu | <b>SPRING BREAK</b>                              |                                   |   |
| 11    | Mar 22 Th | <b>SPRING BREAK</b>                              |                                   |   |
| 12    | Mar 27 Tu | Ecosystem Ecology                                |                                   | Ecosystems section readings: Ch 20-22*        |
| 12    | Mar 29 Th | <i>Discussion: Foundations Past and Present*</i> | Read papers on OAKS               |   |
| 13    | Apr 3 Tu  | Invasive Species Ecology                         |                                   | Ch 23   |
| 13    | Apr 5 Th  | Landscape Ecology                                | Modern Readings assignment 4. DUE | Ch 24   |
| 14    | Apr 10 Tu | <b>Exam III</b>                                  |                                   |   |
| 14    | Apr 12 Th | <i>Discussion: Foundations Past and Present*</i> | Read papers on OAKS               |   |
| 15    | Apr 17 Tu | Ecology of Endangered Species and Ecosystems     |                                   | Ch 23, 25                                     |
| 15    | Apr 19 Th | Global Ecology                                   |                                   | Ch 25   |
|       | Apr 24 Tu | <b>READING DAY</b>                               |                                   |   |
| Final | Apr 26 Th | <b>FINAL EXAM</b><br>8am-11:00am SSMB 138        |                                   |   |

\* discussion prep assignment due \*\* material from Chs 2-5 throughout the term. \*changes due to weather/other will be announced in class and on OAKS

**Course requirements:**

**Exam 1:** 100 points

**Exam 2:** 100 points

**Exam 3:** 100 points

**Final exam:** 150 points

**Writing assignments:** 120 points. (Modern Readings)

**Discussion of literature & participation in hands on activities during lecture:** 100 points

(being prepared – e.g., \*discussion prep questions completed and brought to discussion, participating and attending will earn 80% of the points, adding positive, professional and intellectual engagement with instructor and peers will earn 90% or higher).

**Laboratory** (see lab syllabus for additional details and safety policy, attendance, field preparedness):

**Written assignments:** 300 points

(two assignments from multi-week data collection; Science communication project, other shorter assignments on quantitative protocols and data skill development and understanding processes)

**Active positive participation and collaboration & prelab preparation:** 50 points.

**Total semester points: 1020 points.**

**Grading Policy:** A: 93-100, A-: 90-92; B+: 87-89, B: 83-86, B-: 80-82, C+: 77-79, C: 73-76, C-: 70-72, D+: 67-69; D: 63-66, D-: 60-62, F: <59, other aspects of grading follow the CofC standards. Last day of Add Drop Weds Jan 16; last day of W; Feb 7. Grades reflect the percentage of total points earned as described above.

**Office hours:** Each semester faculty post office hours. Office hours are drop in times when you can come by our faculty office to ask questions, get feedback, pick up material if you missed class, ask for letters of recommendation etc. I'll be sitting in SSMB144 – no pre-appointment necessary to come by my office hour time. Occasionally, I will already be meeting with a student when you arrive, if so please wait patiently and I'll look forward to our conversation. Great thing about office hours – you already know I'm free for a meeting at that time. Have a class during my office hours? Email me with a few times that work for your calendar during the typical work day, and I'll email back which one I'm also free. (Office hours, no emails necessary just come by).

**Assignments and late policy:** Assignments will be turned in on time to be considered for full credit. Discussion prep assignments are due at the start of class as we will have a discussion of the assignment in class. A loss of **5%** will be deducted per school day for **any** late assignment. Zero points will be recorded for an assignment if it is not turned in before the assignment is passed back or content discussed in class. Other than discussion assignment, see OAKS for further instructions and due dates.

**Absence:** The College of Charleston absence policy is in effect in this course. Missing lecture requires students to obtain notes from another student, but feel free to come to office hours with questions. Participation in discussion cannot be made up. Missing exam due to extreme illness or tragedy, please provide documentation through the student format, and independently contact me in a timely manner. Missing and exam due to an academic or athletic obligation, student must make arrangements with me prior to the exam for accommodation. Taking the exam prior to the exam date will be a preferred method.

Attendance is a critical component of participation in activities in the course. Discussion of primary materials will be held during lecture class as well.

**Policy on electronic devices:** All electronic devices may be used during class as long as they allow the student to stay focused on class activities and does not disturb others including instructor. No devices may be used during exams. For some laboratory or hands on activities, devices may be essential. Emergency? Respectfully step out of the classroom.

### **College Required Syllabus Material**

1. **Center for Student Learning:** I encourage you to utilize the Center for Student Learning's (CSL) academic support services for assistance in study strategies, speaking & writing strategies, and course content. They offer tutoring, Supplemental Instruction, study strategy appointments, and workshops. Students of all abilities have become more successful using these programs

throughout their academic career and the services are available to you at no additional cost. For more information regarding these services please visit the CSL website at <http://csl.cofc.edu> or call (843)953-5635.

**2. Center for Disability Services (<http://disabilityservices.cofc.edu/for-faculty/faqs.php>)**

- Any student eligible for and needing accommodations because of a disability is requested to speak with the professor during the first two weeks of class or as soon as the student has been approved for services so that reasonable accommodations can be arranged.
- The College will make reasonable accommodations for persons with documented disabilities. Students should apply for services at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me one week before accommodation is needed.

**3. College of Charleston Honor Code and Academic Integrity as published:**

“Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved. Incidents where the instructor determines the student’s actions are related more to a misunderstanding will be handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student’s file.

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. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others’ exams, fabricating data, and giving unauthorized assistance. Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor. Students can find the complete Honor Code and all related processes in the Student Handbook at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>”

**College Policy on religious holidays and dates specific to 2017-2018 academic year can be found here:**

<http://academicaffairs.cofc.edu/documents/procedures-and-practices/statement-of-accommodation.pdf>

Let me know prior to the event for accommodation.