

***Biology 210: Biology  
Spring 2017***

Professor: Dr. Kristen Cecala

Lecture: TR 9:30 – 10:45

Lab: M 1:30 – 4:30

Course Description: A survey of the principles and applications of ecological science. Lecture will cover the ecology of individuals, populations, communities, and ecosystems. Lab will emphasize field experimentation in the local environment. Prerequisite: Biology 130.

Required Materials:

*Ecology*. Third Edition. By Cain ML, Bowman WD, & Hacker SD  
Additional required readings will be included in our class Google Drive folder

Course Objectives:

- 1) Develop a comprehensive understanding of ecological principles.
- 2) Evaluate the application of ecological principles to applied problems.
- 3) Explore ecological patterns and processes on Sewanee's Domain.
- 4) Develop important process skills for ecology including reading, speaking, and writing.
- 5) Develop skills and tools to evaluate novel ecological questions.

Grading Guidelines:

<i>Item</i>	<i>Points</i>	<i>Due Date</i>
3 Exams	150	2/16, 3/30, 5/2
2 Research Proposals	100	2/21, 4/4
Integrative Exam	100	5/5 @ 9AM
Problem Sets	50	2/2, 3/9
Presentation	50	2/27 or 4/10
Participation	50	Daily
Lab assignments	100	Various
Group Project Proposal	25	4/10
Group Project Report	50	5/1
Group Final Presentation	25	5/1
<i>Total</i>	750	

### Explanation of Grading:

Exams: These exams will cover all readings and materials presented in lecture for that particular unit. They will take the form of short answer to complement the proposal below. Exam grades will be weighted based on performance. The highest grade scored on an exam will be worth 40%, your middle grade 34%, and your lowest grade 26% of the final exam grade.

Proposal: For each unit, you will write a 2-page maximum (single spaced) proposal identifying a research question that will advance the field and a brief methodology for how the question could be addressed using any study system around the globe – you can assume you have unlimited funds! You will present one of your proposals during lab as a formal research presentation.

Integrative exam: The final exam will be an opportunity to integrate all that you learned throughout the semester to address real-world questions.

Problem sets: Ecology relies on quantitative predictions and data analysis, which we will work on throughout the semester. You will have a problem set due for each our population and community units.

Participation: To quantitatively assess participation, we will use a variety of mechanisms including quizzes, lab activities, and collection of paper responses. Because each class will involve paper discussions, it is essential that you come prepared to class to be an engaged participant in the class. To prepare, you will write out the take home message for the paper and 2 questions you had after reading the paper.

Lab assignments: Throughout the semester, we will collect data on a variety of topics. You will be asked to put together different forms of summary information due before the next lab period.

Group Research project: In the last third of the lab, you will perform a novel experiment or study with 1 or 2 other group members on the Domain. You will have 3 lab periods to work on this project, but it may require time outside of class to complete. All work that you complete for this project will be completed as a group, and group functionality will also be assessed.

### Professional Expectations:

*All academic work must adhere to the Honor Code.*

It will be difficult to do well in this course without regular attendance. Late work will be penalized 10% for each day the work is late. You may not make up activities without prior approval. Attendance in lab is mandatory and students will see 50 points deducted from their final grade for any unexcused absence from lab. I will also communicate via email and assume that you will regularly check and respond to email if necessary. Assignments due during lecture will only be accepted by students in lecture or those with a valid excused absence. Most professional endeavors involve group work. We expect each member of a group to participate equally in daily activities and in making progress towards a final goal. Regularly communicate with me and your group members throughout the semester.

#### Accommodations:

The University of the South is committed to fostering respect for the diversity of the University community and the individual rights of each member of that community. In this spirit, and in accordance with the provisions of Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA), the University seeks to provide students with disabilities with the reasonable accommodations necessary to ensure equal access to the programs and activities of the University. If you have a disability and require accommodations in this course, you have the responsibility of presenting your instructor with a copy of your academic accommodations letter from the University Wellness Center (931.598.1270). Accommodations will not be provided without this documentation, and accommodations cannot be applied retroactively. Additional information about disability accommodations can be found at <http://sewanee.edu/student-life/university-wellness-center/>

#### Additional Resources:

**Writing Center:** The Writing Center, located on the main floor of the du Pont Library, provides objective peer support to Sewanee students who seek assistance with their writing projects. The student tutors represent a wide range of majors, and they can help you at any stage in the writing process, including topic development, rough drafts, final drafts, and revisions. For the best results, we urge you to bring a copy of your professor's written instructions when you come. Please plan to stay for the conference with the tutor, as we will not accept papers that are dropped off. More information may be found at: <http://www.sewanee.edu/academics/english/writing-center/>

**Research Help Center:** The Research Help Center in du Pont Library is available for all of your research paper, project, and presentation needs. Our librarians can help with each stage in the research process including topic selection and narrowing, outlining, finding resources, interpreting academic resources, avoiding plagiarism, and integrating research into your paper or presentation. Walk-ins are welcome, but appointments with a research expert are strongly encouraged. You can find more details and sign up for appointments at: <http://library.sewanee.edu/researchhelp/librarians>

#### Schedule:

The attached schedule is a plan for the course and may require deviations. Deviations will be announced as soon as possible.

Week	Date	Topic	Concepts	Reading	Lab
1	1/17	What is ecology?	1.1-3	NA	No Lab
	1/19	Ecological literature and model thinking	1.1-3	Rubin/Pain 2016; Carter et al. 2012	
2	1/24	What is the problem with baby sea turtles??	10.1-10.5	Crouse et al. 1987	Measurements

	1/26	How flexible are populations?	10.2-4, 11.1-2	Crawford et al. 2014	
3	1/31	How do we know if populations are doomed to extinction?	9.1, 11.3	Drake and Griffen 2010	Habitat Selection Exp.
	2/2	How old should you live?	7.1-4	Rees et al. 2001	
4	2/7	How old will you live?	7.1-4	Werner 1986	Vernal Pools
	2/9	What determines where you live?	9.1-3	Urban et al. 2007	
5	2/14	Do all populations exist as metapopulations?	11.4	Hanski 1998	Leslie Matrix Models
	2/16	<i>Exam 1</i>			
6	2/21	Why are predators at their worst when prey is at their best?	13.3-4	Krebs et al. 2001	Optimal Foraging
	2/23	Fluffy versus wild dogs – who wins?	12.1-3	Vanak and Gomper 2009	
7	2/28	Can positive interactions determine distribution and abundance?	15.1-3	Asmelash et al. 2016	<i>Presentations (1/2)</i>
	3/2	What if your competitor can also eat you?	12.4	Sanders and Platner 2007	
8	3/7	A theory to rule them all?	18.1-3	Liebold et al. 2004	Deer distribution Exp.
	3/9	Why do rainforests contain so many species?	19.1-3		
9	3/14	How do we predict where species will occur in the future?	17.1-3, 4.1	Chown and Gaston 2000	Watershed budgets
	3/16	Spring break!			
10	3/21	Spring break!			

	3/23	Spring break!			
11	3/28	How do we predict where species will occur in the future?	18.2, 19.4	Sinervo et al. 2010	Watershed budgets
	3/30	<i>Exam 2</i>			
12	4/4	Biomes and global patterns	3.1-3, 20.1-3	Ellis et al. 2010	<i>Stream bioblitz &amp; Design experiment</i>
	4/6	Where does carbon go?	20.4, 21.1, 21.2	Beedlow et al. 2012; Crowther et al. 2016	
13	4/11	What determines if an ecosystem can support megapredators?	20.4, 21.1, 21.2	Post 2002	<i>Presentations (2/2)</i>
	4/13	Trophic cascades	21.3, 21.4	Schmitz et al. 2000	
14	4/18	Nutrient cycling	22.1-4, 25.3	Bohlen et al. 2004	Independent projects
	4/20	How do animals interfere with nutrient cycling?	22.3	McIntyre et al. 2007	
15	4/25	Alternative stable states	17.4	Scheffer et al. 2001	Independent projects
	4/27	Are some landscapes more resilient than others?	19.4, 24.2, 24.3	Downing et al. 2012	
16	5/2	<i>Exam 3</i>			<i>Group Presentations</i>
	5/5	<i>Friday @ 9am Final Exam</i>			