

## PCB 3043: Ecology Spring 2012, MMC

- Instructor:** **Dr. John Withey**  
OE 212 (office)  
ECS 158 (lab)  
Office Hours: Tu/Th after class in ECS 158 (to 3pm) for study questions  
Tu/Th 3-4 pm in OE 212 for private questions  
or by appointment
- Office: 305-348-4483  
Cell: 206-214-6819  
E-mail: [jwithey@fiu.edu](mailto:jwithey@fiu.edu) — please start all emails to my FIU address  
with the subject line “ECOLOGY:”
- Class meets:** **TuTh 12:30 – 1:45 pm | PG5-153**
- Moodle Site:** <https://ecampus.fiu.edu/> (select Moodle login)
- Textbook (req):** *Elements of Ecology* (2009) by Smith and Smith, 7<sup>th</sup> edition.
- Online resources:** *Elements of Ecology* companion web site: <http://www.ecologyplace.com>  
Peer-Led Team Learning: <http://www.fiupltdl.org>

**Purpose:** Ecology is the study of the interactions between organisms and their physical and biological environment. Through the General Biology courses, you have been exposed to the fundamentals of biology. Through the Ecology course you will have an opportunity to build on this base by learning how scientists answer several key questions in ecology. These questions range from how different species respond to environmental conditions, to how we might apply ecological theory to the pressing conservation challenges of today. I am here to facilitate both your learning of key ecological concepts and the important skills of critical thinking, interpretation and synthesis that will be valuable no matter what career path your future holds.

**Objectives:** After taking PCB 3043, successful students will be able to:

- 1) Understand key ecological concepts related to populations, species interactions, communities, and ecosystems.
- 2) Use ecological terminology in the proper context to communicate your knowledge of key ecological concepts.
- 3) Interpret figures commonly used to communicate results of ecological data analysis and research.
- 4) Summarize the main points of, and critically evaluate, publications from scientific and popular literature related to ecology.
- 5) Apply your knowledge of ecological concepts to new cases, situations, and modern conservation issues.

**The syllabus serves as a contract** between me and each student in Ecology. Please review this syllabus carefully and bring any schedule conflicts (especially with exams) or questions (for

example on grading policy) to my attention during the first week of class. If unanticipated events occur, these will be handled according to the policies in this syllabus and FIU policies.

**Class communications:** I will post all important class announcements on Moodle, so please check the Moodle site regularly. I will repeat these announcements in class. You can ask me specific questions in class, via Moodle, or by emailing me at [jwithey@fiu.edu](mailto:jwithey@fiu.edu); and as mentioned on the first page, please start the subject line with “ECOLOGY: ”

**Readings:** I will assign readings from the Smith & Smith *Ecology* text for most topics. This is NOT the same textbook that has been used in past semesters on MMC for Ecology, although it was used for the BBC course. I have chosen this text in part because it includes more recent developments in ecology and incorporates current and historical research.

In addition to the course textbook, I have assigned additional readings (typically one per week) from a variety of publications for each course topic. *You are responsible for the content of all assigned readings.* We will cover them in class but you need to do these readings before class. All additional readings will be linked to Moodle.

**Lectures:** My class lectures are the core component of this course. I will use slides as the basis for most classes and I will post the slides each day after class on Moodle. In some cases I may include additional slides in the posted material that we did not get to during class time – ALL of the posted material will be important to review.

In addition to the slides, I will often go into more detail on any given topic – for example, verbally in response to student questions, writing down additional notes on a board, watching a relevant video in class to illustrate a particular concept, or going over a figure in detail. Take notes in class to capture the important concepts from this material to study.

**Exams:** There will be three exams and a final in this course. Exam questions will focus on the most recent topics in the course, but after the first exam, up to 20% of the questions will be on topics covered previously in the course. This exam policy reflects the fact that concepts learned later in the course will often depend on the material we cover early on. Use the previous exams as a guide to what concepts are important. The final will be cumulative – any material from the course is fair game – however about two-thirds of the questions will focus on the last topics presented (that is, the topics in Section 4.1-4.3, from April 3 – 20).

The exams and final will be multiple choice. Tests will begin with basic questions (one question, 3-5 answers), and some will be a “section” with multiple, related questions. I will give you examples of both the basic multiple-choice questions, and the multi-question sections, before the first exam. The exams and the final are closed book and must be completed on your own without any materials at your desk other than a pencil (something to drink also OK). Leave all other materials at home or at the front of the classroom. I will hand out multiple versions of the same exams, with both the order of the questions and the order of the answers changed from one version to the next. Your lowest exam score (of the three during the semester, unless evidence of cheating is found) will be dropped for purposes of calculating your grade.

**Online Quizzes:** A total of eight short quizzes will be posted on Moodle for a 24-hour period, beginning Thursday after office hours. The purpose of the quizzes is to reinforce what you learn from the lectures and readings on a semi-weekly basis, before you take each exam. The quizzes are open book, notes, and you are free to collaborate with classmates to try to get the correct answers.

**In-class and Homework Assignments:** I will also assign weekly in-class activities, and give you short homework assignments (always turned in through Moodle), that will typically be graded pass/fail. I will always make clear what is considered an assignment and how it will be graded. These assignments are not shown on the attached course schedule but will always be noted on the Moodle course page.

**Course Grading:** My grading philosophy is that every student should be able to decide what his or her grade will be. I don't mean this literally (you don't get to fill out the grade sheet), but rather that my grading expectations will be clear, I will provide you support for and feedback on your quizzes, assignments, and exams, and if you do your work carefully and extremely well (and on time), you will receive an A. If you choose not to do all of the required work, or not to attend class, or do work that is not carefully done, or is late for unexcused reasons, you will receive something less than an A. Your overall grade is based on the following components:

Course Component	Maximum Points
Highest exam score	100
Second-highest exam score	100
Final	120
Quizzes	80
<u>In-class/Homework Assignments</u>	<u>100</u>
<b>Total</b>	<b>500</b>

**Associated Lab Course:** PCB 3043L is a separate, one-credit course taught by experienced graduate student TA's. The lab and lecture courses are completely independent, but the same ecological concepts will apply to both courses. What students learn in lab can and will help their understanding in lecture, but the lab is graded separately.

**Associated Peer-Led Team Learning (PLTL) workshops:** There will be a brief presentation on the first day of class about participating in PLTL workshops. I recommend participating in this program to assist your learning of ecology, no matter where you are in your preparation. As an incentive to participate, you can substitute your PLTL grade for ONE of the following course components: one of the exam scores (100 pts), the quiz score (80 pts) or the in-class/HW assignment score (100 pts). You must take the final and your PLTL grade will not substitute for the final exam score. I will automatically substitute the PLTL grade for the component that boosts your overall grade in Ecology the most.

**Getting Additional Help:** See the information above about the **PLTL workshops**, in which I highly recommend participating. The **University Learning Center** is on the first floor of the Library, GL-120. They serve all undergraduate students, not just those struggling in a particular class. See <http://undergrad.fiu.edu/learning/index.html> for more information.

**Learning or Physical Disabilities:** If you have a disability that may impact your academic performance, you may request accommodations by registering with the Disability Resource Center (<http://drc.fiu.edu/>). Their MMC office is in Graham Center 190. Once you have completed their intake process, their office will notify me of the accommodations for which you are eligible.

**Contingencies:** Excused absences and prior notification (if possible) are required to make up any course work. A *university-approved* excuse is necessary to qualify for a make-up exam. A documented medical emergency, jury duty, or car accident (documented with a police report) are examples of university-approved excuses. *It is your responsibility* to provide the documentation before I will schedule a make-up exam.

You are responsible for **arriving on time for the Exams and Final**. Leave extra time for traveling to campus on exam days! Bad traffic, car trouble, job interviews, etc. are not acceptable reasons for missing exams or arriving late. If you do arrive late I will allow you to take the exam, in the remaining class time, only if you arrive BEFORE any individual student finishes the exam. Dropping your lowest exam grade means that you can miss ONE exam for any non-excused reason, and it would not affect your grade.

**Academic Honesty:** You are expected to follow the FIU Student Code of Conduct which in this course primarily applies to doing your own work on exams and the final. Cheating (for example, looking at notes, or other students' tests) will not be tolerated and I will have the lab TAs proctor exams in addition to myself. If I find sufficient evidence that cheating has taken place, you will receive a score of 0 for that exam – which will count as your 'second-highest exam score' since it is not eligible to be dropped. You may also be subject to Academic Misconduct procedures and sanctions as detailed in the FIU Student Handbook.

**Final Grades** will be assigned according to the following table according to the total points earned in the class (out of 500). By including pass/fail homework, and dropping your lowest exam score, I am already factoring in a cushion that lifts your grades. I therefore will not give extra credit, or consider how close you are to the next grade up in assigning your final grade. Your work, athletic activities, scholarship requirements, future career plans, etc. are not appropriate for me to consider in assigning your final grade.

<u>Letter Grade</u>	<u>Points</u>
A	450 to 500
B+	435 to 449
B	400 to 434
C+	385 to 399
C	350 to 384
D	300 to 349
F	<300 points

### Sections with Key Questions, Readings, Assignments and Important Dates

**Sec 1.1:** What does the science of ecology teach us? And how can I succeed in this course?

Jan 10: Syllabus

Jan 12: Ecology Ch. 1, 'The Nature of Ecology'  
Assigned Reading #1 (link on Moodle)

**Sec 1.2:** What role does evolution play in the ecological relationships of the modern world?

Jan 17: For review, UC-Berkeley's 'Understanding Evolution' site (link on Moodle)  
Ecology Ch. 5, 'Ecological Genetics', 5.1-5.7, pp. 74-85

Jan 19: Assigned Reading #2 (link on Moodle)

Jan 20: Online Quiz 1

**Sec 1.3:** Where do species live and how can they live there?

Jan 24: Ecology Ch. 3, 'The Aquatic Environment'

Jan 26: Ecology Ch. 4, 'The Terrestrial Environment', plus 20.3-20.4, pp. 416-421

Jan 31: Ecology Ch. 6, 'Plant Adaptations', review 6.1-6.7; lecture will focus on 6.8-6.13

Feb 2: Ecology Ch. 7, 'Animal Adaptations', 7.1-7.3 (including pp.134-135) AND 7.8-7.11

Feb 3: Online Quiz 2

Feb 7: Assigned Reading #3 (link on Moodle),  
Complete Ch.7 (7.12-7.20)

Review of Course Secs 1.1-1.3

**Feb 9: Exam 1**

**Sec 2.1:** What major factors limit or regulate populations?

Feb 14: Ecology Ch. 8, 'Life History Patterns'  
Assigned Reading #4 (link on Moodle)

Feb 16: Ecology Ch. 9, 'Properties of Populations'

Feb 17: Online Quiz 3

Feb 21: Ecology Ch. 10, 'Population Growth'

Feb 23: Ecology Ch. 11, 'Population Regulation'

Feb 24: Online Quiz 4

Feb 28: Finish Population topic slides as necessary  
Assigned Reading #5 (link on Moodle)

Review of Course Sec 2.1

**Mar 1: Exam 2**

**Sec 3.1: What determines the outcome of species interactions?**

Mar 6: Ecology Ch. 13, 'Interspecific Competition', 13.1 and 13.5-13.12  
Mid-course assessment by the Center for the Advancement of Teaching (required in-class activity)

Mar 8: Ecology Ch. 14, 'Predation', 14.1 and 14.5-14.15  
Assigned Reading #6(link on Moodle)

Mar 12-16 ***Spring Break***

Mar 20: Ecology Ch. 15, 'Parasitism and Mutualism'

**Sec 3.2: How are ecological communities structured?**

Mar 22: Ecology Ch. 16, 'Community Structure'  
Assigned Reading #7(link on Moodle)

Mar 23: Online Quiz 5

Mar 27: Ecology Ch. 17, 'Factors Influencing the Structure of Communities'  
Ecology Ch. 18.1 (pp. 369-373)  
Review of Course Secs 3.1-3.2

**Mar 29: Exam 3**

**Sec 4.1: How does energy and matter flow through ecosystems?**

Apr 3: Ecology Ch. 20, 'Ecosystem Energetics', review 20.1-20.4, lecture will focus on 20.5-20.12

Apr 5: Ecology Ch. 21, 'Decomposition and Nutrient Cycling'  
Assigned Reading #8 (link on Moodle)

Apr 6: Online Quiz 6

**Sec 4.2: What is unique about urban ecosystems?**

Apr 10: Ecology Ch. 22, 'Biogeochemical Cycles', and p. 34, 'Urban Microclimates'

Apr 12: Assigned Reading #9 (link on Moodle)

Apr 13: Online Quiz 7

**Sec 4.3: How do landscapes affect ecological processes?**

Apr 17: Ecology Ch. 19, 'Landscape Ecology'

Apr 19: Ecology Ch. 12, 'Metapopulations', 12.1-12.5.  
Assigned Reading #10 (link on Moodle)

Review of Course Secs 4.1-4.3

Apr 20: Online Quiz 8

**Tuesday, April 24, 12 – 2 pm: Final Exam**

### ***How to succeed in PCB 3043 this semester***

**Elements of Ecology Textbook:** You should plan on reading the assigned sections/chapters of the textbook either before or after the corresponding lecture. Find out which works best for your learning – skimming the chapter before lecture then reading it in detail later? Reading it in detail before lecture and reviewing it before exams? Or some other combination?

When I have assigned the whole chapter for a particular lecture day, I will likely emphasize certain parts, and in some cases I will skip over background material you learned in General Biology. The concepts I cover in lecture will be those that I consider critical for your understanding of ecology, but you should do all of the assigned textbook reading for complete preparation.

Special boxes in the textbook include ‘Quantifying Ecology’, ‘Ecological Issues’, and ‘Field Studies’. You should always read through these, as they will help deepen your understanding of the concepts covered in the chapter. If I include the material in my class lecture then you should review it before exams, but otherwise I won’t expect you to know the details.

**Additional Readings:** Try to do the following for each reading:

1. Briefly describe the main results (or arguments made or conclusions drawn) of each reading, as if to a friend in the class.
2. Answer the question, ‘what ecological topics or key concepts does the reading illustrate or relate to?’
3. Evaluate on your own whether you agree that the data support the conclusions of the authors (if a scientific article), or whether you agree with the arguments the authors make (if more opinion-based), or how significant you believe the ecological story to be (if from the popular literature).

**Exam Structure:** The three exams during the semester will have the same structure. The first 20 questions will be standard multiple-choice questions with 3-5 answers to choose from, worth 3 points each. Then there will be six multi-question sections. Each of these six sections will start with a basic question worth 2 pts, and then subsequent analysis or interpretation questions worth 2-5 points each. On each exam, 72 out of 100 points will be considered core material. If you do the readings, attend lectures, review these materials and ask for help if you don’t understand anything, you should be able to answer questions related to the core material fairly readily. The other 28 points will require a deeper understanding of the ecological concepts covered on the exam.

**Studying for Exams and the Final:** To score enough points for an ‘A’ or ‘B’, you will need to achieve a mastery of the material sufficient to apply it to new cases and examples, not just the examples presented in the textbook or on my slides. Everything we cover in class – the slides, answers to questions posed by students, class discussions, videos shown, additional notes I make on the computer or on a board – may be included on exam questions. So the .pdfs of class lectures are a useful studying tool but not sufficient to achieve an ‘A’. Reviewing the .pdfs of

my lecture slides posted on Moodle will be to your benefit in studying for exams, but you should expect complete explanations as I do include a lot of text on my slides.

I will provide some time for review questions, during the last part of class on Tuesday before each Thursday exam, and continue answering questions during office hours that day. I will also schedule an additional review session on the Wednesday before an exam (possibly as an online chat session). I will not provide review questions for these sessions, rather it is up to you to prepare specific questions and come to the review. Vague or over-general questions such as “I don’t understand competition” are not appropriate – please prepare questions targeted for the specific topics you are struggling with.

**Space for Notes on First Day of Class (1/10/12)**