Class meetings:
Mon/Wed, 1 PM – 2:30 PM, January Hall 110

Instructor:
Dr. Eleanor Pardini, epardini@wustl.edu, 314-935-4884, McDonnell 403
Office hours: Monday 9-10 AM and by appointment

Teaching Assistants:
Seth Berkman, sethberkman@wustl.edu
Sarah Britton, s.britton@wustl.edu
Kyle Vickstrom, kyle.vickstrom@gmail.com
The Natural Sciences Learning Center (NSLC) in the Life Sciences Building is available for tutoring or group study. You may request tutoring from a TA at any time.

Graduate Teaching Fellows:
Kristin Powell, kipowell@wustl.edu
Lauren Woods, lmwoods@wustl.edu

Required textbook:
Ricklefs, R.E. 2008. Economy of Nature, 6th edition. W.H. Freeman & Company. New York. The textbook has an accompanying website that contains data analysis modules, living graphs, and self-tests to aid your learning. To sign in, go to http://bcs.whfreeman.com/ricklefs6e/ and supply the instructor email (epardini@wustl.edu) to link to this course. There is a copy of the textbook on library reserve.

Course description:
Ecology is the study of how organisms interact in and with the environment. These interactions drive the organization of life across all levels of ecological systems, including organisms, populations, communities, ecosystems, and the biosphere. In this course we will cover the physical environment, ecosystem processes, population dynamics, species interactions, and community diversity. The focus of the course will be on basic ecological principles but we will consider how they underlie issues of conservation, management, and policy. Throughout the course we will also emphasize the process of scientific inquiry, including the importance of testable hypotheses, robust experimental design, and quantitative analysis.

Blackboard course website:
The course website will be on Blackboard, which can be accessed at bb.wustl.edu using your WUSTL key. The Blackboard course site will contain PPT slides, handouts, assignments, answer keys, and other important course information, as well an online gradebook. The website will be updated regularly. Slides from class meetings will be posted on the website, but be aware that they cannot replace the discussions and activities that take place during class meetings.
Learning goals:
The elements of this course are designed to help you master important principles in ecology as well as skills in scientific inquiry. By the end of the course you should be able to demonstrate mastery of these skills by being able to critically evaluate the research methods and results of others, as well as design your own experiments that are rooted in observations and scientific literature and are robust in their design. Specific learning goals for this course are for you to be able to:

- Understand that ecology is the scientific study of relationships between organisms and their environments at the individual, population, community, and ecosystem levels
- Appreciate that ecology is a quantitative science, and understand the importance and utility of basic statistics and mathematical models in ecology
- Critically evaluate scientific papers, specifically, to identify key results and evaluate the implications of those results based on the research methods used
- Describe and utilize the process of scientific inquiry, specifically to
  - Develop corresponding questions, testable hypotheses, and predictions based on observations, data, or results from published literature.
  - Understand elements of research design and how they impact results and conclusions
  - Justify predictions, inferences, and conclusions based on quantitative data
  - Read, interpret and draw graphical representations of data
  - Understand and interpret basic statistics (for example, understanding the need for statistics in biology, understanding basic statistical concepts such as variance, sample size, and statistical significance, and being able to choose the appropriate statistical analysis for a given dataset)
- Integrate ideas from class with current issues as well as personal, consumer, and political choices with respect to human interaction with the natural world

Assessment:
The grade you earn in this course will be based on the following component parts:

- **10%** Class meeting participation
- **20%** Problem sets and primary literature responses
- **45%** Exams (three non-cumulative exams)
- **25%** Grant proposal
- **100%** Total

The following scale will be used to assign final course grades. If you are taking this course Credit/No Credit, you must receive a C+ or better to receive Credit.

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A+</td>
<td>97%+</td>
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<tr>
<td>A</td>
<td>93 - 96%</td>
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<tr>
<td>A-</td>
<td>90 - 92%</td>
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<tr>
<td>B+</td>
<td>87 - 89%</td>
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<tr>
<td>B</td>
<td>83 - 86%</td>
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<tr>
<td>B-</td>
<td>80 - 82%</td>
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<td>C+</td>
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<td>C</td>
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<td>C-</td>
<td>70 - 72%</td>
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<td>D+</td>
<td>67 - 69%</td>
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<td>D</td>
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Class meeting participation:
Class meetings will include both lecture and small group activities. Activities are designed to give you the chance to work through concepts and practice problem solving with each other and with instructors. Classwork may involve individual or group worksheets or minute-papers and may occur any time during the class period. I will periodically collect classwork and review your answers to get informal feedback on teaching and learning, but activities will be scored for participation only. To earn full credit for this component of your grade you need to earn credit for at least 80% of the items collected; receiving credit on fewer than 80% of the class activities will earn a proportion of the points. There are no late submissions; the 80% rule allows for occasional illnesses or absences.
Problem sets and primary literature responses:
There will be periodic assignments to be completed at home. There will be 3-4 problem sets designed to give you a practice applying concepts or using quantitative methods. Some problem sets will be started during class and finished after class; they will usually be due at the beginning of the next class. We will also read 4-5 scientific papers to illustrate class concepts, provide exposure to current research, and give you practice evaluating methods, results, and conclusions. For each scientific paper, there will be a short set of questions posted on Blackboard for which you should prepare a brief, typed response. You should bring two copies of your typed response to class; you will turn one in at the beginning of class and use the other during class discussion.

Exams:
There will be three non-cumulative exams on February 15, March 28, and May 9 (third non-cumulative exam, assigned final exam time slot). Each exam will cover material from class meetings, group activities, discussion, homework, and reading since the previous exam. Exams will be composed of multiple choice, short answer, and short essay questions. There are no make-up exams. There will be a TA-led review session 1-2 days before each exam.

Grant proposal:
In the second half of the semester you will write a grant proposal that develops a hypothesis and experiment on a research question of your choice. The assignment will consist of several phases designed to give you a chance to develop your ideas and revise your drafts with feedback from your peers and instructors. At the end of the semester we will hold a mock National Science Foundation panel session during which you will peer review each other’s grants. Then, just as in practice, you will have the opportunity to incorporate reviewer comments into your final grant submission, which will be due at the end of the semester. More detail on the elements of the assignment, grading rubric, samples, and due dates will be distributed later in the semester.

Academic integrity
The academic integrity policy of Washington University in St. Louis states: "Effective learning, teaching and research all depend upon the ability of members of the academic community to trust one another and to trust the integrity of work that is submitted in classes for academic credit or conducted in the wider arena of scholarly research. When such an atmosphere of mutual trust exists, the free exchange of ideas is fostered, and all members of the community are able to work to achieve their highest potential. In all academic work, it is important that the ideas and contributions of others be appropriately acknowledged, and that work that is presented as original is in fact original. Ensuring the honesty and fairness of the intellectual environment at Washington University is a responsibility that is shared by faculty, students, and administrative staff." The complete policy and procedures are available at: http://ja.wustl.edu/academicintegrity/policy.php.

As a student at Washington University, it is your responsibility to become familiar with, understand, and abide by the standards outlined in this policy before performing any academic work. Ignorance of these policies is not a defense in cases of infringement. Evidence of a violation or attempted violation of the policy will be forwarded to the Committee for Student Academic Integrity. Students found guilty by the Committee will be given a grade of F for the course and be referred to the Dean for further action.
Attendance and class participation:
I expect you to attend class, actively engage in activities, and take notes on lectures and class discussions. I will not take daily attendance but I will occasionally collect individual and/or group work that will contribute to the score you earn in the "Class meeting participation" component of your grade. I will review your work but it will be scored only for presence and participation. To earn full credit for this component of your grade you need to earn credit for at least 80% of the items collected, which allows for the occasional illness or absence. If you miss a class meeting, it is your responsibility to check Blackboard and/or touch base with your classmates to find out about assignments and due dates.

Late work:
To be fair to all students in the class and to the instructors who are responsible for grading, no late work will be accepted after the item is collected (including work collected at the beginning of class). If you become ill and need to miss a class on an assignment due date, you may send your assignment with a classmate or email me the assignment by the beginning of the missed class period.

Exam regrading policy:
Every attempt will be made to grade exams fairly, consistently, and accurately. If you disagree with the way your answer on an exam was graded, you may submit a written request for a regrade. Regrade requests will be accepted for 72 hours following the receipt of your graded exam in class and must follow the format outlined in the regrade request instructions posted on Blackboard. If you submit an exam question for regrading, we reserve the right to regrade the entire exam, after which your regraded score will be used in calculations for your final grade.

Laptops and cell phones:
You may use a laptop to take notes, but activities such as using Facebook, shopping online, or playing games are very distracting to other students. If I find you using your computer in a way that distracts other students I will ask you not to bring your computer to class. Turn your cell phones to mute and refrain from texting during class. Class time is too valuable to waste!

Collaborative learning
Collaborative learning can facilitate deep learning and foster communication and problem-solving skills that are useful in most jobs. In this course you will work in informal groups during class and may occasionally work together on specified portions of problem sets. In class, please respect fellow students by being courteous to one another, actively participating, and refraining from distracting behavior.

Help is available!

Technology issues and support:
I will not consider technology excuses in this course. There are computer labs in Olin Library, the Natural Sciences Learning Center, and other locations around campus. Make sure you back up your work to avoid losing data or work if your computer crashes. It is your responsibility to make sure you have access to Blackboard. You can access help for Blackboard by clicking “Help” at bb.wustl.edu, http://ondemand.blackboard.com/students.htm, or contacting WU Student Technology Services (http://sts.wustl.edu/).

Contacting me:
I want everyone to have a meaningful learning experience and to do well in this course. The only way for me to know if you are struggling is for you to communicate with me. Please visit my regular
office hours or contact me to set up another time to meet. I will work hard to respond to student concerns and emails but I am not available at all hours of the day and night: allow 48 hours for email responses; do not wait until the last minute (< 3 hours before something is due, after 5 PM, or on a weekend) to email about a concern, as I will not be able to help you at those times.

Disability resources:
Students who are seeking disability information or support for a disability should contact Disability Resources (DRC) at 935-5970. Disability Resources is located at Cornerstone in Gregg Hall on the South 40. Disability Resources is responsible for approving and arranging all accommodations for Washington University students. If you require special accommodations for exams or other course activities, please see me as soon as possible so that I can arrange for accommodations for you. Complete information is available at: http://www.cornerstone.wustl.edu/.

Academic resources:
I want everyone to have a meaningful learning experience and to do well in this course. The only way for me to know if you are struggling is for you to communicate with me. Please feel free to email me, call me, stop by my office hours, or ask to meet with me at another time. I will do whatever I can do facilitate your learning experience in this course. I encourage you to take advantage of free academic peer mentoring and training in learning skills offered by Cornerstone (http://www.cornerstone.wustl.edu/). I also highly recommend the following book as an excellent resource for learning skills for reading, studying, taking tests, writing, and time management: Nist, SL and JP Holschuh (2006) College Success Strategies, 2nd ed. Pearson Education, Inc, New York.

Schedule of topics:
1. Science literacy and quantitative literacy
   a. Methods of study used in ecology
   b. Scientific inquiry
   c. Quantitative analysis and basic statistics
2. Life and the physical environment
   a. Physical environment
   b. Responses to variable environments
   c. Cycling of energy and matter in the ecosystem
3. Population dynamics
   a. Population growth and regulation
   b. Harvesting and invasions
   c. Extinction
   d. Metapopulations and spatial ecology
4. Species interactions and communities
   a. Consumer-resource dynamics
   b. Competition
   c. Species diversity and biogeography
   d. Succession, disturbance, and restoration

*This syllabus is subject to change; students who miss class are responsible for learning about any changes to the syllabus*