**FW 364: Ecological Problem Solving**

**Fall 2013 Syllabus**

**Course Information**

Lecture: Mondays & Wednesdays 10:20-11:10AM

225 Natural Resources

Labs: Section 1: Tuesdays 8-9:50AM, 1210 Anthony Hall

Section 2: Tuesdays 10:20AM-12:10 pm, 1210 Anthony Hall

Office Hours: Mondays 11:30-12:30, NR40A

Tuesday 9:50-10:20, 1210 Anthony Hall

Final Exam: Tuesday, Dec.10, 10AM-12pm

Credits: 3 credits

**Course Description and Goals**

The focus of this course is on taking the preparation you have had in ecology and the training you have had in math to be able to apply those skills to real world ecological problems. We will explore the process of investigating ecological problems through several phases:

1. First we will examine data that other people have collected and learn about how to think about data, observations, and how that data might be used to develop models (ie. equations or other quantitative conceptual frameworks) to predict ecological outcomes.
2. Secondly, we will be using models to apply ecological principals. For example, we will be studying mass-balance models which are commonly used to understand carbon emissions and their effect on global climate change, population growth models that are used for determining fisheries and wildlife harvest, age-structure models which are used for conservation of threatened and endangered species, and predator-prey models which are used in understanding and controlling effects of invasive species. We will address these models and others throughout the semester in a variety of ecological contexts.
3. Thirdly, we will look at cases where ecological models are applied, and think about the limits of those models. You can make predictions using models, but no model can account for every aspect of reality.

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We will be repeating this process throughout the semester in a variety of ecological contexts. Ultimately, my goal is to prepare you to complete this same process in your future work. My goal is not to cover every model that exists in ecology (which would be impossible), but rather to help you develop skills that will allow you to complete this process in the unique contexts of your future work.

**Instructor, Email Policy, and Teaching Philosophy**

Instructor: Sara Syswerda

Email: parrsar1@msu.edu

Phone: 616-322-3632

Course Website: <http://saraparrsyswerda.weebly.com/fw364-ecological-problem-solving.html>

Email policy: Outside of office hours, email is the best way to reach me. When emailing, please be sure to include FW364 in your subject line so I do not accidently delete your email. I will do my best to respond to your emails within 24 hours.

Philosophy: As an instructor, student learning is my priority. I am here to help you succeed in this course. Please do not hesitate to contact me about questions that arise from lecture and lab activities, general course questions, and other questions related to the study and practice of ecology.

**Prerequisites**

MTH124 or MTH132 or LB118 (concurrently OK)

STT224 or STT231 or STT421

ZOL355 or BE230

Some calculus and matrix algebra will be used in this course.

**Attendance Policy**

“90% of life is just showing up.” –Woody Allen

Attendance is not mandatory, but there will be activities that will completed during class for a grade. So, though attendance is not mandatory, your grade will likely be better if you show up.

**Course Materials**

Textbook (optional… but software required): Akçakaya, H.R., M.A. Burgman, and L.R. Ginzburg. 1999. *Applied population ecology: Principles and computer exercises using RAMAS EcoLab, Second Edition*. Sinauer, Sunderland, MA, USA. Out of print, but available for purchase online (as a PDF file with associated software). Buy the book used online, as it is way cheaper (e.g., **Amazon.com**, Half.com). Although the textbook is not required (all readings are optional), you will need the Ramas software that accompanies the text.

**Late work policy**

 Late work will not be accepted unless permission is granted before the assignment is due.

**Make-up exams**

 Except in the case of a medical emergency, all make-up exams must be scheduled prior to the regularly scheduled exam. I will need written documentation of the reason for your absence.

**Academic Honesty Policy**

I assume that the student is honest and that all course work and examinations represent the student’s own work. Violations of the academic integrity policy such as cheating, plagiarism, selling course assignments or academic fraud are grounds for academic action and/or disciplinary sanction as described in the university’s student conduct code. Incidents of plagiarism are taken very seriously and will be pursued. Students are strongly cautioned not to copy any text verbatim; when describing someone else’s ideas, please use appropriate quotations and source citations. For University regulations on academic dishonesty and plagiarism, refer to:

<https://www.msu.edu/unit/ombud/academic-integrity/plagiarism-policy.html>.

**Grade Break-Down by Percentage**

Lab reports 40 %

In class work 15 %

Midterm I 15 %

Midterm II 15 %

Final exam 15 %

**Grading Scale**

100 % - 90 % - 4.0

89.9 % - 85 % - 3.5

84.9 % - 80 % - 3.0

79.9 % - 75 % - 2.5

74.9 % - 70 % - 2.0

69.9 % - 65 % - 1.5

64.9% - 60 % - 1.0

Less than 59.9 % - 0.0

Curving:I reserve the right to curve grades during the semester, if needed. Curving will always benefit the student (i.e., I will always curve “up”, never “down”).

Exams: Exams will cover material learned in both lecture and lab.

**Lab Reports**

Reports are due 2 weeks after they are assigned (by 5pm on the due date by email). No late reports will be accepted unless a dispensation is granted before the report is due. Note that there is generally time available during weekly lab meetings for students to work on assignments. Students can work collaboratively to complete lab exercises, but students must work individuallyon the writing of lab reports submitted for grading. All reports must be typed, and must include a narrative explanationof rationale, assumptions, calculations and results, along with tables or graphswhen needed. Save your report files, at least until after grades are posted. Please download the handouts describing each lab exercise from the course website. To complete reports, you will need to access files that you create during class. You can save files on a portable device (thumb drive, external hard drive) or to your P: drive during class. Files saved to your P: drive (also called AFS space) can be accessed from any microcomputer lab on campus. You can access your P: drive from a personal computer via the internet by logging on to Netfiles ([https://netfiles.msu.edu](https://netfiles.msu.edu/)) using your MSU NetID and password (see Netfiles instructions at <http://techbase.msu.edu/article.asp?id=7897>).

Three software programs will be used in class: Microsoft Excel 2007, Ramas Ecolab 2.0, and Stella 8.1. Excel and Stella are accessible from most microcomputer labs on campus, whereas Ramas must be installed before each use in a microcomputer lab.

Grading of reports will be based primarily on assessment of the student’s understanding of the problem and the organization and clarity of the report. For some assignments there is no single right answer. Students who do poorly on a report may turn in a different assignment for grading as a substitute.

**Accommodations for Disabilities**

If you have a disability or special need that requires accommodations, please inform me during the first week of class so I can develop a plan to work with you. If you have not yet contacted the Resource Center for People with Disabilities, please call (517) 884-7273 (voice) or (517) 355-1293 (TTY) to make an appointment with a counselor.

**Lecture and Lab Schedule1, 2**

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| **Dates** | **Monday Lecture** | **Tuesday Lab**  | **Wednesday Lecture** | **Reading** |
| Aug. 28 | *No class* | No lab | Introduction/Syllabus |  |
| Sept. 2-4 | *Labor Day -no class* | Ecosystems/Mass Balance | Ecosystems |  |
| Sept. 9-11 | Ecosystems | Ecosystems/Mass Balance | Ecosystems |  |
| Sept. 16-18 | Population Growth | Blue Whales | Population Growth | Chapter 1 |
| Sept. 23-25 | Variation in Populations | Blue Whales | Variation in Populations | Chapter 2 |
| Sept. 30-Oct. 2 | Review/Wrap up | Review for midterm | **Midterm 1** |  |
| Oct. 7-9 | Variation in Populations | Density Dependence | Regulation of Populations | Chapter 3 |
| Oct. 14-16 | Regulation of Populations | Density Dependence | Age Structure of Populations | Chapter 4 |
| Oct. 21-13 | Age Structure of Populations | Brook Trout | Age/Stage Structure of Populations | Chapter 5 |
| Oct. 28-30 | Stage Structure of Populations | Loggerhead Turtles | Stage/Spatial Structure of Populations |  |
| Nov.4-6 | Spatial Structure of Populations | Review for Midterm | **Midterm 2** | Chapter 6 |
| Nov. 11-13 | Predator/Prey Interactions | Spotted Owls | *No class* |  |
| Nov. 18-20 | Predator/Prey Interactions | Predator-Prey | Predator/Prey Interactions |  |
| Nov. 25-27 | Competition | Competition | Competition |  |
| Dec. 2-4 | Competition | Review for Final Exam | Review/Wrap Up |  |
| **Dec. 10** | **Final Exam 10am-12pm**  |   |  |  |
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1. All lectures meet in NR 225, all labs meet in 1210 Anthony Hall
2. The schedule is subject to change at the discretion of the instructor