Field Ecology and Evolution (ZOL/PLB 440)
Course Syllabus – Summer 2015
Class meets at 9 am in room 140 Stack Bldg.
Dress to go into the field.

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Course Goals and Design: This course provides an introduction to field research in ecology and evolution, including hypothesis development, sampling and data collection, analysis, and written and oral presentation of results. We will conduct two short field research projects as a class (one focusing on terrestrial evolutionary biology and one focusing on aquatic ecology). These class projects will be followed by small-group research projects designed by students (with help from the instructors). Readings, short lectures, and class discussion will provide the background for you to design your research projects, and the instructors are available to help you carry out your research. All projects are a group effort, and all students will learn how to develop and test hypotheses in ecology and evolutionary biology.

The evolutionary class project will focus on floral adaptations to insect pollinators, and the ecology project will focus on predator/prey interactions and the ecology of fear. We expect the small group research projects to follow up on ideas and observations developed in the class projects; however, groups have considerable freedom to design their own research projects. Each group will present the results of their research to the class on Friday, July 31st in a 15-20 minute oral presentation. Groups will get feedback on their projects from the instructors and from their fellow students. Student will also write an eight-page (double-spaced) paper (in the format of a grant proposal) outlining what they would do next in their research system. Grant proposals are to be written individually and are due 5PM on August 3rd). At this point, proposals will be distributed for peer review, and we will reconvene Wed August 5th at 1pm for a grant proposal panel to discuss (and decide whether to fund) each proposal. Students will then have an opportunity to revise their proposals based on panel comments and resubmit a revised version to instructors by noon Friday August 7th. General information on how to write the grant proposal is provided at the end of the syllabus.

Grades and all that: An important part of this course is **participation** - this includes involvement in the discussion of papers and project ideas for each class project, "cheerful" participation in data collection, sample processing (including cleanup!), data analysis and discussion of each project, and competent peer reviews of the final grant proposals. Participation counts for 30% of your final grade and will be awarded based both on instructor/TA observations, the quality of your written proposal reviews, and also potentially on anonymous surveys of your classmates. The small-group project (including the oral presentation) counts for 35% and the individual grant proposal counts for the other 35%. Thus, your final grade in the course will be a weighted average of your grade (4 point scale) in each of the three following areas.

	(percent of final grade)
Participation in Class Projects	30%
Small group project and oral presentation	35%
Individual grant proposal	35%

Grading scale. Semester grades will be determined using the MSU scale below.

Final Average (%)	Total points	Grade
>90	>450	4.0
>85	>425	3.5
>80	>400	3.0
>75	>375	2.5
>70	>350	2.0
>65	>325	1.5
>60	>300	1.0
<60	<300	0.0

Classroom/Field conduct. Each student in this course is a valued member of our educational community and deserves respect. We may discuss some "hot-button" issues in class about which you may have strong opinions. That is great. We look forward to hearing from all of you. Please present your views thoughtfully and with respect for the opinions and humanity of your colleagues, who may disagree with you. As with all of your courses, please do not disrupt the class: silence your cell phones before entering the class (including when outside in the field), use your computers for note-taking only (not Facebook), treat your neighbors with respect, and avoid engaging in distracting activities.

Honesty and integrity. The excellence of science depends upon the honesty and integrity of its practitioners. As scientists, we are committed to upholding the highest standards in the pursuit of truth. This is our job and our calling. We expect similar commitment from you. Thus, cheating in this class is a particularly poor idea. Cheating includes plagiarism, falsifying data, etc. **Students who cheat will fail the assignment, may fail the course (depending on the severity of the infraction), and may face additional university sanctions.** For additional information about academic honesty at MSU, you may consult Article 2.3.3 of the Academic Freedom Report, which states that "the student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." The College of Natural Sciences adheres to the policies on academic honesty as specified in General Student Regulations 1.0, Protection of Scholarship and Grades, and in the All-University Policy on Integrity of Scholarship and Grades, which are included in Spartan Life: Student Handbook and Resource Guide.

Things to Contact Us About at the Beginning of the Term

Accommodations for disabilities. If you have a disability or special need that requires accommodations, please inform us during the first week of class, so we can develop a plan to work with you. If you have not yet contacted the Resource Center for People with Disabilities, please call 353-9642 (voice) or 355-1293 (TTY) to make an appointment with a counselor.

Religious holidays. If you will be absent from class to observe a religious holiday, please let us know within the first two days of class, so we can make arrangements with you.

Missing class because of conflicts with other university activities. If you need to be excused from this class to participate in a one-time required activity for another course or university-sanctioned event, please talk with us right away and bring *written authorization* from the faculty member of the other course or from a university administrator. We will do our best to accommodate you, within the constraints of this course. You can expect to be assigned make-up activities. Regularly missing class is not advisable.

Things to Contact Us About During the Term

Anything! We like to know how the term is going for you. Our reward as teachers is getting to know you as individuals and helping you to find your intellectual gifts. Tell us about your questions about ecology and the course, science in general, your career plans or not-yet-plans. We'd like to hear from you!

Here are some additional times when <u>you should definitely come talk with us</u>:
--Missing class because of extended illness: If you are suddenly burdened by illness that is likely to be prolonged, please contact us immediately to make arrangements.
--Death or serious illness in the family: Please let us know right away.
--Feeling overwhelmed: We can help you with course concerns or steer you towards other resources.

Things to Contact Us About at the End of the Term

Research positions. We strongly advise that undergraduates gain experience through working or volunteering in professors' labs at MSU and/or summer internships elsewhere. This hands-on experience is often invaluable for clarifying career goals. We will strive to make you aware of such opportunities.

SIRS Evaluations. Michigan State University takes seriously the opinion of students in the evaluation of the effectiveness of instruction, and has implemented the SIRS (Student Instructional Rating System) process to gather student feedback. This course utilizes the "online SIRS" system. You will receive an e-mail sometime during the last two weeks of class asking you to fill out the SIRS online form at your convenience. Please note the final grade for this course will not be accessible on STUINFO during the week following the submission of grades for this course unless the SIRS online form has been filled out. You will have the option on the online SIRS form to decline to participate in the evaluation of the course – we hope, however, that you will be willing to give us your frank and constructive feedback so that we may instruct students even better in the future.

SCHEDULE

Date	Topics/Activity	Lead Instructors
July 6 (Mon 9AM)	Course overview, introductions & RCR (am)	All
	Introduction to plant/pollinator interactions (am)	Conner
	Brief introduction to statistics (am)	Dittmar
	Discussion of journal articles (am/pm)	Conner, All
	Field excursion and plan class project (pm)	Conner, All
July 8 (Wed)	Field project and data collection (am/pm)	Conner, All
	Discussion of data analysis (pm)	All
July 10 (Fri)	Data analysis (am/pm)	Dittmar, All
	Presentation of project results (pm)	Conner, All
July 13 (Mon)	Introduction to aquatic systems and predator-prey interactions (am)	Roth
	Discussion of journal articles (am)	Roth, All
	Field trip to Wintergreen Lake or experimental ponds (pm)	Roth
	Plan class project (pm)	All
July 15 (Wed)	Field/Lab experiments and data collection (am)	Roth
	Discussion of data analysis (pm)	Roth, All
July 17 (Fri)	Data analysis (am/pm)	Dittmar, All
	Presentation of project results (pm)	Roth, All
July 20 (Mon)	Discussion of small-group projects (am) Introduction to grant proposal writing (am) Form research groups, get started on projects	All
July 22 (Wed)	Discuss project status (am) Work on small-group projects	All
July 24 (Fri)	Discuss project status (am) Work on small-group projects	All
July 27 (Mon)	Discuss project status (am) Work on small-group projects	All
July 29 (Wed)	Work on small-group projects, data analysis	All
July 31 (Fri)	Presentation of projects to class (am)	All
Aug 3 (Mon)	Grant proposals due (5pm)	
Aug 5 (Wed)	Grant proposal panel (1pm)	All
Aug 7 (Fri)	Revised version of grant proposal due (if revision desired) (noon)	

ZOL/PLB 440 Presentations and Grant proposals

The **grant proposal** should consist of:
a. A short project **Summary** (1 paragraph) in which you describe the question to be asked, why the question is important, and generally how you will approach it.
b. An **Introduction** in which you review the literature relevant to your problem, and indicate how your proposed research will contribute important new understanding of the field. Your introduction should contain two items:
1) The specific hypotheses or questions to be addressed by your proposed study. The goal here is to convince the reader that your proposed work is interesting and important.
2) A review of the literature. Your literature review should not be exhaustive, but should be synthetic and point out the gaps in our knowledge that the proposed research will fill. By synthetic, we mean that you should not summarize the findings of each paper, but rather put them together to summarize what is known and what is not well-known in the area. The introduction sections from the papers assigned in class can be a good guide for this section.
c. **Preliminary studies / results to date**: Describe the results of your group project here, including figures and tables of analyzed or summarized (not raw) data and statistical analysis.
d. **Proposed experimental design and methods / proposed research**: Describe your proposed work in terms of:
1) Comparisons or manipulations you intend to make and the experimental units on which you will make them,
2) What data you will collect and how you will collect it, including details like sample sizes. Be specific so that the reader can evaluate whether it is likely to work.
3) Describe how the data will be analyzed (as specifically as possible) and
4) How the results will address the question(s) posed in the introduction.
e. **Literature cited**: Use the format used by any of the journals in which the class readings were published, except *Science* and *Nature* (i.e. you should give the full title of each paper cited). You probably should have at least 5 references cited in this section, and may need more. This section does *not* count as part of your 8-page limit.

Proposals are 5-8 double-spaced pages, 12-point font, 1 inch margins, excluding references, tables, and figures.

Presentations should cover sections b, c, e above. Each member of the group should present a roughly equal portion of the presentation, which should last no more than 15-20 minutes total.

For both presentations and proposals, you will be **graded** on the following four areas:
1. **Clarity of presentation** – including writing style, organization, and presentation of specific hypotheses.
2. **Additional analyses** – what did you do with the class data beyond what we did in class?
3. **Background literature** – are you familiar with some of the relevant literature, and do you use it to generate interesting and novel proposed research?
4. **Proposed and completed research** – is your research well-designed, and do you make it clear how it will answer the question(s) or hypotheses posed in the introduction?