

Most scientists regarded the new streamlined peer-review process as 'quite an improvement.'

Methods in Ecology & Evolution Spring 2016

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COURSE DESCRIPTION: Methods in Ecology and Evolution is an intermediate course in the Department of Biology. It is a foundational-building course that contains instructions on reading the primary literature in ecology and evolutionary biology, conducting literature searches, designing experiments, writing scientific papers, using quantitative methods, exercising critical thinking skills for data analysis, creating graphs and developing specific laboratory skills as needed for ecology and evolutionary biology. Overall, A LOT to accomplish in 7 weeks so students can be prepared for future upper-level courses.

SYLLABUS PHILOSOPHY: Most of the information that you need for success occurs in this syllabus. Keep It handy similar to a car manual in the glove box. Any changes in the syllabus--- particularly deadlines --- may be posted on Moodle. Also keep track of readings on Moodle.

STUDENT LEARNING OBJECTIVES: By the end of the course, students should be:

1. Quite adept at finding appropriate peer reviewed literature;
2. Experienced in the concepts of experimental design, data collection and analysis;
3. More skilled at reading primary literature;
4. Cognizant of the important of revision and the constructive feedback of peers;
5. Knowledgeable about the methods of scientific writing;
6. Better equipped to conduct and analyze statistical analyses;
7. Well-versed in modes of social media that ecologists can use to promote their science; and
8. Able to hold intriguing conversations about the 'peripherals' of being a scientist

COURSE WORKS IN CONCERT WITH BIOLOGY DEPARTMENT STUDENT LEARNING OBJECTIVES:

1. Students will understand & apply knowledge & concepts about functioning of living systems;
2. Students will accurately and thoughtfully identify, evaluate and critique research and research literature on biological phenomena;
3. Students will clearly, accurately and in appropriate styles, communicate about biological phenomena and research orally, in writing and graphically;
4. Students will accurately, appropriately and safely perform physical techniques of biological investigation; and
5. Students will accurately and appropriately apply quantitative reasoning and methods to biological problems.

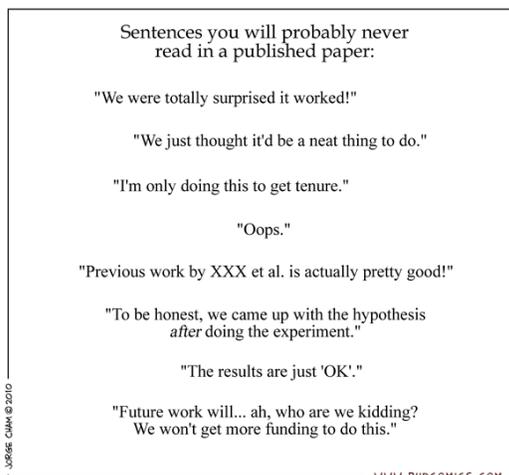
ENGAGEMENT: I expect students in Methods to actively engage with the material. Seven weeks and the nature of the course material does not give much leeway for getting behind. Students will also come with different skill levels and exposure to statistics, which may make it more challenging for some than others. The key thing to realize early is that **SCIENCE TAKES TIME AND THIS CLASS WILL TAKE A LOT OF TIME**. Combined with Methods in Cell and Molecular Biology, students receive 4 hours of academic credit for 6 hours in class as occurs with a traditional upper-level biology lecture and lab. In some cases, you will have substantial exercises to complete outside of class time.

WORKLOAD: Generally, two assignments (one Skill and one Writing) come due **EVERY DAY** in this course. You should prepare to devote between 2 and 2.5 hours outside of class for every hour in class. This equates to scheduling an additional 8-10 hours a week to devote to this course. Students will acquire both writing and analytical skills in the classroom as well as through hands-on experimentation in the lab. This Methods Course also involves a significant writing component. Students are encouraged to consult with me, the Guide for Writing in Biology & the Writing Center on campus.

PARTICIPATION: Regular class participation is the default circumstance for students in upper level Biology courses. Class participation involves discussing primary literature, posing questions about class materials, following thru exercises and working well in groups.

- **Outstanding** = Particularly noteworthy class participation will grant you a 1% benefit of the doubt at final grade time. In other words, an 89% B+ would end up as a 90% A-.
- **Acceptable** = Regular class participation assures course standing (no change)
- **Below Average** = Less than frequent class participation/poor attendance (i.e. 2 unexcused absences) lowers your grade by 1/2 letter (i.e. B+ = B)
- Unacceptable Number of unexcused absences (> 3) or extreme lack of participation will result in course failure. I will notify you of your status half way through the course (in case improvement is needed).

If you are curious at any other time, just ask. Please note that 2 accounts of being excessively late (beyond 15 minute warm-up window) = 1 unexcused absence. Please be on time.



IMPORTANT NOTE: I LOVE methods. I love statistics. I love teaching students how to do science. Thus, sometimes, I can get a little overzealous. I have worked hard to design a course that I think will greatly benefit you in your future courses and hopefully your own research. Of course, there is a caveat. This is always a course in development – so, as things go along, PLEASE come and talk to me about how it is going and if we need to make any other considerations (although the syllabus schedule is pretty prescribed, THERE IS ALWAYS ROOM FOR CHANGE.

REQUIRED TEXT: How to Write and Publish a Scientific Paper**Paperback:** 300 pages**Publisher:** Greenwood; 7 edition (June 16, 2011)**Language:** English**ISBN-10:** 0313391971**ISBN-13:** 978-0313391972**REFERENCE:** Statistics for Terrified Biologists**Paperback:** 360 pages**Publisher:** Wiley-Blackwell; 1 edition (April 28, 2008)**Language:** English**ISBN-10:** 1405149566**ISBN-13:** 978-1405149563**COURSE MANAGEMENT SYSTEM:**

Moodle represents the learning management system now used by Southwestern. This web-based, open source program will be instrumental to this class. You sign into Moodle with your regular su-ID and password either through the SU-Portal or at the website:

lms.southwestern.edu. This interactive system will enable you to:

- Download files (primary literature, assignment instructions/rubrics, etc...)
- Keep track of your grades
- Submit assignment and get on-line feedback
- Keep a calendar and view each week and the upcoming activities and/or assignments
- Communicate with your peers

STUDENTS' BILL OF RIGHTS FOR METHODS:

Each student can expect access course materials prior to class. Although the focus of the class will be on apple snails, students can expect to learn general skills applicable to any ecology topic. Each student can expect that I will arrange appropriate office hours when schedule conflicts. Throughout the course, students can expect to improve their writing & presentation skills. Each student can expect a classroom environment conducive to learning. If this is not the case, see me immediately. In addition, students can expect that I will be attentive to their needs and flexible if excused absences (illness, sports, etc.) occur. By using Moodle, students can expect Methods to be as "green" or "paperless" as possible. **Students can use one "Had a Bad Day" Pass for an extension on an assignment that doesn't involve others.** If engaged, students can expect that three hours of class will still go quickly and that we talk about important issues in science.

PROFESSOR AND COURSE EXPECTATIONS FOR STUDENTS:

Every student will be on time to class. This means 8:30 a.m. at the latest as we will use the first 15 minutes of class for Q&A...Sometimes, if needed, class will start at 8:15 am. The on-time policy is necessary to maximize the learning potential of the classroom. I expect that students will have read the assigned reading before we cover this material in class. METHODS expects that you will be responsible for your own mastery of the material. If you have questions about concepts presented in the text or lectures, it is your responsibility to find the answers to questions or seek my help. I expect that students will provide adequate warning if they are going to miss a class for legitimate academic circumstances.

It remains the student's responsibility to review the class material and ask questions. I **expect that students check their email routinely**. I expect the classroom environment to have a relaxed atmosphere where students can feel free to express opinions or ask questions. Students must respect other people's opinions even if they differ from theirs. I expect that students will take some time to reflect on what they are learning. I expect that students will contribute their own intellectual ideas. I expect that, although the course focuses on apple snails, the skill gained can be applied to any set of biological research.

OTHER POLICIES:

• OPEN COMMUNICATION

Students are expected to discuss questions and areas of concern with me.

• ATTENDANCE - Students are expected to prepare for and attend each class meeting. See information above for participation guidelines. More importantly than just attendance, lack of preparation will diminish your capacity to fully engage in the intellectual pursuits and debates of class.

• TIMELINESS

Arrive to class ON TIME – which in the case of the earlier start time for Methods includes a 15 minute grace period. Informal Q&A will start at 8:15 a.m. Most days New material or the start of an activity will begin at 8:30 a.m. If you come in later than 8:30, come in quietly and take your place. Anything less is disrespectful to me and your peers. Note that 2 late instances = 1 unexcused absence.

• EMAIL

I will frequently email to remind you of deadlines or to clarify points from a lecture. Please check your e- mail daily. You may also receive emails from Moodle.

• DROP DATES

- Due to the rapid nature of the mini-courses, please note the early drop dates.
 - **3/21/16 -- drop without record; 4/8/16 -- drop with a "W"**

• LATE PAPERS The best advice is to turn in your work on time. Moodle will show the deadlines for each of the assignments. At the latest, work should be brought with you and turned in during the beginning of class. A 10% penalty accompanies late work turned in before the next class period.

• HONOR CODE

All course work is to be done independently unless otherwise noted. You should type in the Honor Code on electronic assignments or fill out the questions on quiz items. Please write out and sign the honor pledge IN FULL according to the following:

I have acted with honesty and integrity in producing this work and am unaware of anyone who has not.

If you are unclear on the concept of plagiarism or cannot sign the honor code in good faith, please see Dr. Burks immediately. When in doubt, paraphrase and cite using Name and Year methods (Burks 2003). Any perceived impropriety will be discussed with the student and then the appropriate action pursued.

- **ACCOMMODATIONS** - Southwestern University will make reasonable accommodations for persons with documents disabilities. Students should provide documentation and schedule an appointment with the Office of Student Success.
- **FOOD** - Not allowed in the computer lab but fine to have snacks for the break between activities.
- **FACEBOOK** - I'm happy to be "A Friend" with SU students with the knowledge that I am a faculty member at Southwestern first. I will not ask students to be Friends because I do not want to exert inappropriate pressure. As a "friend" and professor, I have a vested interest in students and an obligation to the University to take any concerns that catch my attention seriously. I'm not in the habit of checking up on students but I cannot help but read updates when posted. So, if there were something posted in an update that spoke to a personal concern or threat to any other student, then I feel obligated to follow up on the post. In what I hope to be rare instances, my follow-up actions may take the form of a message from me or a call by me to appropriate University personnel better equipped to handle dramatic situations. I think it important that you know this ahead of time. My Profile page serves as an all-inclusive insight into my life for my friends, family and some students. I do not post anything there that I am not willing to publicly share (this is good advice). If you are happy with this "condition," then great. If it makes you at all uncomfortable, then feel free to Defriend - will not take it personally at all.
- **CELL PHONES** Please turn all cell phones to SILENT/VIBRATE during class. You may use cell phones to keep track of the time but should not be actively texting or e-mailing in class. In the case that you need to be in contact with another party (family emergency, etc...), then quietly and unobtrusively leave the room to respond to a call if received. Violation of such policy will reduce your participation score in class.

- **LAPTOP COMPUTERS**

If such activity enriches your material retention, feel free to take notes during class on a laptop computer. In some classes, we will utilize laptops in class for interactive exercises. At all times, your focus should be on the class activity and not on alternative activities (i.e. Facebook, e-mail, etc...). Violation of such policy will reduce your participation score in class.

COMPONENTS: The course is divided into three main components totally 1000 points:

1) Writing Exercises; 2) Skill Sets; and 3) a comprehensive Exam

I have divided the writing exercises and skill sets into low stakes (25 points = 2.5%), medium stakes (50 points = 5%) and high stakes assignments (between 75 – 200 points = 7.5% - 20%).

Minimum A = 925 Points
 Minimum B = 825 Points
 Minimum C = 725 Points
 Minimum D = 625 Points

Minimum A - = 895 Points
 Minimum B - = 795 Points
 Minimum C- = 695 Points
 Minimum D- = 595 Points

Minimum B+ = 875 Points
 Minimum C+ = 775 Points
 Minimum D+ = 675 Points
 F = less than 595

Science Chitchats:



We will have two times in which we discuss bigger issues in science. 60% of the participation points (15 points) will be earned by steering a discussion and the remaining 10 (40%) points will be awarded based on engagement with the remaining conversations. Each group should pick 2-3 mainstream articles to serve as a discussion basis. Possible topics include open access, ethics, storytelling and science communication, gender issues in science, authorship, mentoring or creativity.

"Stake" Level	Designation	Description	Type of activity	Due Date IC = inclass	Points
Low	Skill 1	Citations	Solo	3/8	30
Low	Skill 2	Active Voice	Solo	3/10	20
Low	Skill 3	Video Proposal	Group	3/22	25
Low	Skill 4	PP PL Exp. Design	Solo	3/24 -IC	25
Medium	Skill 5	Excel	Solo/Pair	F 4/1	50
Medium	Skill 6	SPSS 1	Solo/Pair	F 4/8	50
Medium	Skill 7	SPSS 2	Solo/Pair	F 4/15	50
Low	Skill 8	Figures	Solo/Pair	4/19	25
Low	Skill 9	Peer Review	Solo	4/21 - IC	25
High	Skill 10	Video	Group	4/26	75
					375 (37.5%)
Medium	Writing 1	Writing About Snails	Solo/Pair	3/8	50
Medium	Writing 2	Methods A & B	Solo	3/10; 3/22	25/25
Medium	Writing 3	Abstract	Solo	3/22	50
Low	Writing 4	Reading Guide	Solo	3/25	25
Medium	Writing 5	Group Script	Group	3/29	50
Low	Writing 6	Science CC Idea	Solo	3/31	25
Low	Writing 7	Script Edits	Group	4/5	25
Medium	Writing 8	Sigma Xi Idea	Solo	4/7	50
Low	Writing 9	Sigma Xi Grant	Solo	4/22	25
Medium	Writing 10	Exam Questions	Group	4/26	50
					400 (40%)
Low	ChitChat	Participation			25 (2.5%)
High	Course	Exam			200 (20%)