Ecology – BIO50-434
Spring 2015
"Theme: Ecology on Campus & Beyond"

COURSE DESCRIPTION:
Ecology constitutes an upper-level biology course dedicated to learning how abiotic and biotic mechanisms determine the abundance of different species in the natural world. We will cover a wide-range of topics from species interactions to community dynamics and ecosystem processes. Most importantly, we will discuss and engage in how the scientific discipline of ecology fits into the larger issues of basic research and conservation practices.

CAPSTONE REQUIREMENT: This is an advanced level biology course that integrates knowledge and concepts from Cellular, Molecular and Organismal Biology. Thus enrollment in this course partially fulfills the capstone requirement in Biology. I expect you to integrate and build upon material and skills you have learned in the required pre-requisites (First Year Bio, Statistics, Methods in Ecology & Evolution).

SEMESTER THEME:
This semester of Ecology will focus on exploring ecology on campus and examining the resources that we have to ask ecological questions connected to broader disciplines including demography, environmental studies and economics. In addition, the course will focus on student-driven inquiry and discovery.

EXPERIMENTAL GROUP PROJECT: Campus garden plots
APPLIED INDIVIDUAL PROJECT: Art & Ecology project
FIELD TRIPS: Art.Science.Gallery, Lady Bird Johnson Wildflower Center, San Gabriel River, Hill Country

Example garden plot

Class - Tuesday/Thursday 1:00 – 2:15 p.m. FJSH 148; Lab - Thursday 2:30 – 5:00 FJSH 248. Note: Students will be expected to use the time between lecture and lab for set-up or travel to lab or field sites.

Faculty: Dr. Romi Burks, Professor of Biology
Office/Lab: FJSH 141/145;

Phone: 863-1280 or 512-869-8098 (not post 9pm)
Office Hours: Mondays, Wednesdays 10-12;
Tuesdays 3-5 and as needed

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SYLLABUS PHILOSOPHY: I think of syllabi as "owner manuals" for courses just like you would have an owner's manual for any car that you drive. As such, this syllabus contains extensive information about the course and the expectations and should be used as a first resource when questions arise. Some rubrics will occur on Moodle. Think of Moodle as parallel to "traffic" or "exit" signs that point to important information.

TAKE HOME MESSAGES:
1) This course has been planned with the experience of the professor. However, real ecology falls outside the range of "cookbook science" where a known set of ingredients produces an expected result. Because we depend on the inherent variability present in nature, flexibility and improvisation will be expected and probably the norm.

2) On field or campus garden days, STUDENTS WILL BE EXPECTED TO WORK OUTSIDE IN MOST WEATHER with the presence of lightning as the notable exception.

3) All students will need to be individually responsible for their progress but also to work effectively in pairs or as a team.

4) STUDENTS SHOULD EXPECT TO SPEND 1-2 HOURS OUTSIDE OF CLASS FOR EVERY HOUR IN CLASS INCLUDING THE LAB = (5-10 HOURS OUT OF CLASS = 10-15 TOTAL).

From my perspective, I have 5 main learning objectives for ecology:

- Content (**KNOW ECOLOGY**)- for students to gain an understanding of the ecological principles that guide the natural world
- Critical Thinking (**THINK ECOLOGY**)- for students to be able to read and critique primary literature papers
- Experimental Experience (**DO ECOLOGY**)- for students to conduct experiments of their own, collect, analyze and share results (garden plots)
- Context (**TALK ECOLOGY**) - for students to learn to communicate the value of ecology to the general public, develop materials that enhance learning, etc...
- Field (**SEE ECOLOGY**)- for students to engage in outside world through field trips

BIOLOGY DEPARTMENT STUDENT LEARNING OUTCOMES: Throughout their degree,

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

ENGAGEMENT: As addressed above, students in Ecology need to be actively engaged with the material. Many of the concepts may be familiar; however, understanding the mechanism(s) behind these familiar concepts will take much more time than expected. Please do not underestimate the time it takes to prepare for class. Learning about ecology involves learning how to ask questions. Students will acquire this skill both in the classroom as well as through hands-on experimentation in the lab.

COURSE COMPONENTS:

KNOW ECOLOGY

- **QUIZZES – 150 POINTS (10 X 15) – DROP LOWEST =15%**

Cain et al. (2014) covers the general concepts in ecology with a lot of general information. Learning to recognize important concepts, trends, terms, and processes represents a key skill for students. To address this, students will complete quizzes during the course of the semester over the reading. Each quiz will be worth 15 points and include the following sections:

1. Vocabulary – 5 key words that the group finds critical to understanding (2.5 points)
2. Key People/Concepts – 5 "pioneers" in the field of ecology and their contributions (5 points; questions can be done in variety of ways)
3. Connect the dots – one question that asks students to connect the material in this chapter with another concept (2 points)
4. Key Figure – focuses on one of the figures from the text and asks a "thinking" question that requires interpretation and context/implication (3 points)

Notes about quizzes:

1. Will be posted as Word Files on Moodle at least 24-hrs before due date
2. SHOULD BE DOWNLOADED, PRINTED, COMPLETED AND BOUGHT TO CLASS
3. Due at the beginning of class
4. Honor code applies; no additional material
5. The lowest of the 11 quizzes will be dropped.
6. Groups of 2-3 students will each write 1 quiz & receive a grade out of 15 based on the quality of the written quiz
    - Structure, coverage, attention to detail, justification

- **TAKE HOME EXAMS (MIDTERM AND FINAL) – 200 POINTS (2 X 100) = 20%**

Notes about exams (tentative):

1. Multiple Choice – 10 questions (2 pts x 10 = 20 points)
2. Matching – 20 items of concept and implication or connection (0.5 pt x 30 = 15 points)
3. Figure Explanation (2 x 10 = 20 points): I will pull two figures from papers that you have read or similar to figures we discussed in class. You will critique the figures and then write the figure caption, outline the experimental design and described the results statistically.

4. Abstract Evaluations (2 x 10 = 20 points): You will be asked to review two different abstracts and to put each in the context of how it connects to class material.
5. Connect the dots – essay where students connect material across chapters (25 points)

THINK ECOLOGY:

- **PRIMARY LITERATURE PRESENTATIONS & PARTICIPATION 150 PTS (15%)**

After providing an introduction to the topic, a trio of students (or pair) will then guide the class through the primary literature paper. Remember that one should rely on your peers to have questions worthy of discussion but each pair should have their own list prepared to foster discussion. Your participation evaluation depends not only on your ability to review the paper but also to engage others. As we work through the paper in class, you will want to guide a discussion of the paper that includes the following points:

1) Introduction of Players (what organisms used?)
2) Hypotheses Tested
3) Experimental Design & Statistics
4) Relevant Figures – Discuss the data
5) How does this compare with other studies? (i.e. Discussion)
6) 3 Strengths and weaknesses of paper?
7) What is the Take Home Message? Next Step?

The paper must be experimental in nature and you must choose a paper at least 1 week prior to your presentation day. ***The trio (pair perhaps) should provide a 1-pg reading guide for the paper***. All members of the class will read the paper and must bring two questions for discussion and an evaluation of the abstract.

Trio presentation	50 points (5 total in class)
Questions/Abstract Evaluation	60 points (3 x 20 pts)
1 PL critique	40 points (on one of 5 papers)

DO ECOLOGY (LAB) – 350 POINTS - 35%

Each lab group will submit a research proposal that includes: Introduction, Hypotheses to be Tested, Materials & Methods, Expected Results, Appropriate Statistical Analyses and 2 Additional Primary Literature References. Design, data collection and data assembly and verification can be done together within the group. All statistical analysis and graphing must be done on an individual basis.

• Methods review lab (see handout/rubric)	100 points
• Garden experiment proposal (group)	50 points
• Individual abstract and statistical analysis	50 points
• Group poster presentation	100 points
• Field trip and lab notebook reflections	50 points

TALK ECOLOGY (ART PROJECT) – 150 POINTS - 15%

Based on the inspiration received from a visit to Art.Science.Gallery, students will create an original work of "art" that emphasizes an ecological principle. Components of the grade will be a project idea, response to review, mid-course progress report, exhibition card, ecological summary and quality execution of project.

GRADING: 1000 POINTS

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	Below 595 = F

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, working effectively in groups, engaging in lab and maintaining a positive attitude towards field and laboratory work.

- **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 lowers your grade by 1/2 letter (i.e. B+ = B)
- **Unacceptable** - Number of unexcused absences (more than 3 lectures or 2 lab periods) or extreme lack of participation will result in course failure. If I have any serious concerns, I will bring them to your attention immediately. If you are otherwise curious, please inquire at any time.

BOOK REQUIRED: Cain et al. 2014. Ecology. 3RD edition (ISBN 978-0-87893-908-4). This book also provides a companion website (http://www.sinauer.com/ecology) that students can use The Ecology companion website features review and study tools to help students master the material presented in the textbook. It comes in different versions of availability. Available in the SU Bookstore and other on-line retailers.
RECOMMENDED: Day & Gaston –*How to Write and Publish a Scientific Paper* and a statistics reference.

STUDENT BILL OF RIGHTS (Expectations for Ecology)

- Students can expect access to the course materials in a reasonable interval (24-hrs) prior to class. (see Moodle)
- Students can expect class to begin on time.
- Students can expect that I will alternatives for any schedule conflicts and that I will be attentive to their needs and flexible if excused absences (illness, sports, etc.) occur.
- Students each have one "Bad Day" in which they can request a "Had A Bad Day Pass" that grants them up to a 3-day extension on any assignment that does not affect others.

- Students should expect to spend at least 1 – 2 hours out of class reading, studying or working on assignments for every hour in class including lab.
- Students can expect to improve their writing & presentation skills ·
- Students can expect a classroom environment conducive to their learning.

PROFESSOR EXPECTATIONS OF STUDENTS:

- Student will be on time to class. I expect that students will have read and taken notes on the assigned reading before we cover this material in class.
- I also expect that you will go back and re-read assigned chapters and review your class notes within 1-2 days of being given.
- ECOLOGY expects that you will be responsible for your own mastery of the material. If you have questions about concepts presented in the text or discussion, it is your responsibility to find the answers to questions or seek help.
- I expect that students will provide adequate warning when missing class for legitimate academic circumstances. It is the student's responsibility to review the class material and ask questions.
- 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.

FACEBOOK POLICY:

Most students seem to have a Facebook account. If you don't have one, that is perfectly fine. All official class information goes through Moodle.

• 1st point: I will not set up a Facebook site for the course. If someone wants to take the initiative to make a group, I am in favor of group studying and brainstorming.

• 2nd point: I avoid setting up my own groups because if I send any student an invite, I think that they have to be "my friend" in terms of not wanting to say no to a professor.

• 3rd point /Friend policy: I'm happy to be "A Friend" to a current SU student, but I am a faculty member at Southwestern University first. If something worries me, I will follow up. I believe in better safe than sorry. At the same time, I neither have the time nor I am in the habit of not in checking up on students. However, I cannot help but read updates when posted.

• 4th point: My Profile page is all-inclusive for my family and friends. I do not put anything there that I am not willing to publicly share (this is good advice). So, feel free to request to be my friend, I will certainly accept but I do not want to compel people.

OTHER POLICIES:

• OPEN COMMUNICATION - Students should discuss questions and areas of concern with me.

• **EMAIL I will frequently e-mail (most often through Moodle) to remind you of deadlines or to clarify points from a lecture.** Please check your e-mail daily.

• ATTENDANCE - Students are expected to prepare for and attend each class meeting. More importantly than just attendance, lack of preparation for class will diminish your capacity to fully engage in the intellectual pursuits of class.
• TIMELINESS - Arrive to class ON TIME. Anything less is disrespectful. This means ready to engage when the class begins.
• FIELD WORK - Be prepared to get wet & dirty on field days and in campus garden.
• **DROP DATES: 2/16 without record entry or 3/30 for W.**
• LATE PAPERS - Assignments are due at the beginning of the class period. If you forget to bring an assignment, you have 20 minutes after class in which to obtain it – otherwise the assignment is late. Late assignments are subject to a 20% penalty per day. The best advice is to turn in your work on time.
• **HONOR CODE – FYI: I take this very seriously**

Academic Dishonesty: All course work is to be done independently. We are all very fortunate to have the Honor System here at Southwestern. In general, professors establish ground rules for acceptable collaboration or rules for exams and students follow those rules. You must write out and sign the honor pledge on all individual work to be graded. For electronic work, you should type the pledge and create an electronic signature. The wording is as follows: ***"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 Me. 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 Academic Services Coordinator (located in the Prothro Center).
• **PAIR OR GROUP WORK** - All students are expected to contribute equally to projects done in pairs or groups.
• **FOOD/DRINK** - I do not mind if we "snack" in class as long as it is not disruptive.
• **CELL PHONES/LAPTOPS/PDAs, etc...**
Unless you want me to answer it when it rings, please turn your cell phone off (this does not mean vibrate). Exception: If you have a family or personal emergency that requires it on, then fine. If it rings, please leave the room as quickly and quietly as possible. For Laptops/PDAs/IPads, etc...if you wish to use electronic devices to take notes and follow along with the slides, then no problem. If discovered randomly searching or emailing during class, students will be asked to leave.

Build Your Own Ecology Class – Schedule

Week	Date	Day	Activity	Reading	Notes and/or Assignment Due
2	1/20	Tues	Build syllabus		
	1/22	Thurs	Share papers		Presentation
3	1/27	Tues	What is ecology?	Ch. 1	
	1/29	Thurs	Physical environment	Ch. 2	**Quiz 1 – RB** **Lab 1 due 5 pm 1/30**
4	2/3	Tues	**Primary Lit 1 – Trio 1**		
	2/5	Thurs	Environmental Variation	Ch. 4-5	**Quiz 2 – RB**
5	2/10	Tues	Ecology and Evolution	Ch. 6	
	2/12	Thurs	**Primary Lit 2 – Trio 2**		
6	2/17	Tues	Life history & behavioral ecology	Chs. 7-8	2/16 = Drop w/o W **Quiz 3 – RB**
	2/19	Thurs	Art.Science.Gallery FT		
7	2/24	Tues	Population Distribution	Ch. 9	**Quiz 4 – Trio 5**
	2/26	Thurs	Go to Brown Symposium		1 pg. Ecology in 3D
8	3/3	Tues	Population Growth	Ch. 10	
	3/5	Thurs	Population Dynamics	Ch. 11	**Quiz 5 – Trio 4**
9	3/10	Tues	**Primary Lit 3 – Trio 3**		
	3/12	Thurs	Competition	Ch. 12	**Quiz 6 – Burks**
10	3/17	Tues	*Spring Break – no class*		
	3/19	Thurs	*Spring Break – no class*		
11	3/24	Tues	Predation/Parasitism	Ch. 13-14	**Quiz 7 – Trio 2**
	3/26	Thurs	Exam Review		*Take Home Exam Due 3/30 12 pm*
12	3/31	Tues	**Primary Lit 4 – Trio 4**		3/30 = Drop Day
	4/2	Thurs	Community Ecology	Ch. 16-17	**Quiz 8 – Burks**
13	4/7	Tues	Biogeography	Ch. 18	
	4/9	Thurs	Species Diversity	Ch. 19	**Quiz 9 – Trio 3**
14	4/14	Tues	*Creative Works – no class*		
	4/16	Thurs	**Primary Lit 5 – Trio 5**		
15	4/21	Tues	Applied Ecology	Ch. 23 – 24	**Quiz 10 – Trio 1**
	4/23	Thurs	Nutrient Cycling	Ch. 22 & 25	**Quiz 11 – Burks**
16	4/28	Tues	Last Day of Class		
Final 1	5/4	Mon	Final Time		*Take Home Exam Due*
Final 2	5/6	Wed	**if needed		

Build Your Own Ecology Lab – Tentative Schedule

Week	Date	Day	Activity	Notes and/or Assignment Due
2	1/22	Thurs	Share papers	Presentation
3	1/29	Thurs	Garden Introduction	
4	2/5	Thurs	Garden Time	Proposals Due 2/9
5	2/12	Thurs	Garden Time	
6	2/19	Thurs	Art.Science.Gallery	
7	2/26	Thurs	Go to Brown Symposium	1 pg. Ecology in 3D Art Ideas Due
8	3/5	Thurs	Garden Time	
9	3/12	Thurs	Wildflower Center	
10	3/19	Thurs	Spring Break – no class	
11	3/26	Thurs	Garden and Data Analysis	
12	4/2	Thurs	Field Day	Art Progress Report
13	4/9	Thurs	Research Poster Presentations	
14	4/16	Thurs	Field day	
15	4/23	Thurs	Art Presentations	Art Projects Due