

INTRODUCTION TO ECOLOGY
Evolution, Ecology, and Organismal Biology 503.03
Autumn 2008

INSTRUCTORS

Dr. Ralph E.J. Boerner
280 Aronoff Laboratory
Telephone: 292-6179
email: boerner.1@osu.edu

Dr. Stuart A. Ludsin
232 Aquatic Ecology Laboratory
Telephone: 292-6208
email: ludsin.1@osu.edu

COURSE MEETINGS

Lecture: Tuesday and Thursday 8:30-9:48 AM, Room 1184 Postle Hall (College of Dentistry)
Recitation: One hour on Tuesday, Thursday or Friday in Jennings 0130 or 0136.

TEXT

Molles, M.C., Jr. 2008. *Elements Concepts and Applications*, 4th edition. Available at University Bookstore and other campus area bookstores.

MATERIALS POSTED ON Carmen

On the EEOB 503.03 Carmen site you will find this syllabus, lecture outlines, supplemental lecture materials, lists of study questions, examples of questions from past exams and the grades you earn through the quarter. Unless otherwise noted, you are welcome to download materials from the 503 Carmen site and print them for your personal use.

POLICIES AND PROCEDURES

Course Structure

Evolution, Ecology, and Organismal Biology (EEOB) 503.03 has two 78-min lectures, one 48 minute recitation, and one four hour lab per week. Reading assignments for the lecture are all from the course text, as shown on the lecture schedule and reading assignment page.

All of the Graduate Teaching Associates involved in this course are working towards graduate degrees in ecology or evolutionary biology. These instructors bring their talent and experiences to bear in making the course an exciting, thought-provoking experience, and to aid students not taking the lab portion in making their learning experience as rich as possible.

The recitation sessions in EEOB 503.03 will serve two purposes. First, they will give each student a weekly opportunity to ask questions and have clarified for them material from the lectures and text readings. Second, we will use some of the recitations to give students hands-on practice with mathematical models of ecological phenomena. Although no graded assignments will take place in the recitations, your success in EEOB 503.03 will be enhanced by your participation in the weekly recitations.

The labs in 503.03 will include experiments, demonstrations, problems, and discussion of journal papers, and are designed to enrich and supplement material covered in lecture and the textbook. Most lab exercises will require data analysis and a written summary of the results to be prepared outside of class.

Grading

Your final grade for EEOB 503.01 will be determined on the basis of 650 points, allocated to three lecture exams (two midterms and a final, 100 points each), three seminar

summaries (25, 35, and 40 points), and several laboratory assignments (250 points).

Lecture Exams

There will be three lecture exams, each of which is worth 100 points. Exams are composed of primarily of questions that require written answers of 1-5 sentences (i.e., mini essays). To give you an idea of the types of questions we ask, a sample of questions from old exams is posted on Carmen. Ecology is a quantitative science, so some exams will include problems. You may use a calculator on all exams.

You will be given an opportunity after your graded exams are returned to request that certain questions be re-graded and point deductions reassessed. The procedure for exam re-grading is as follows:

- ✓ After you receive your graded exam, consult the posted exam key to determine how/why your answers differed from those we sought;
- ✓ For each question you believe should be re-graded, assemble a paragraph describing why you feel your answer deserves more points than were assigned. Your rationale should refer to material from the text and lectures in defense of your view.
- ✓ Submit your re-grading request and your original exam to Dr. Boerner no later than one week after the exam was returned to you.

Seminar Summaries

You will write and submit three seminar summaries during the quarter. The seminar summaries will be based on invited seminars on ecological topics that you attend and summarize in one page, well-constructed essays. As we expect your summaries will improve with practice, each successive summary will carry more credit. Seminar Summary I is worth 25 points, Summary II is worth 35 points, and Summary III is worth 40 points.

These summaries should demonstrate to the instructor that you understood the basics of the science presented, and that you can communicate the topic and major findings of the research being discussed. We will also require that you relate that information to topics we cover in our lectures and readings. A template you should use in preparing your seminar summaries can be downloaded from our Carmen site.

Seminar series offered by EEOB, the Environmental Sciences Graduate Program (ESGP), Natural Resources, and other departments and programs may be used, as long as the topic covered is predominantly ecological (a partial listing of weekly seminar series can be found in the same Carmen file that has the seminary summary template). Be aware that many seminars that deal with environmental issues may not be ecological in nature, and full credit for seminar summaries is only possible when the topics are clearly related to the principles and practice of ecology.

If you are unsure as to whether a given seminar will qualify as ecological, check with Dr. Boerner or your recitation instructor. Unexcused late submissions will be penalized 20% per day, beginning with the end of the class period in which the summary was to be submitted.

Make-up Exams

Make-up exams will be given only if the student must miss the regularly scheduled exam due to (1) a university-organized or university-sanctioned event or (2) a medical or family emergency. In the case of a university-organized or-sanctioned event, the student must submit appropriate documentation no later than 10 days before the examination, and must schedule the time and place for the make-up exam with Dr. Boerner prior to the event. In the case of medical

emergency, the student must submit documentation from a licensed medical care facility or provider as soon as possible after the exam is given. Make-up examinations will cover the same range of material and will be of comparable difficulty, but will be entirely essay in format.

Only Dr. Boerner can approve make-up exams; do not take requests for make-up exams to your lab instructor.

“Final” Lecture Exam

The third of the three lecture exams will be given during Final Exam week. It is currently scheduled for final exam is on **Wednesday, December 10 at 7:30 AM in our regular lecture room, PH 1184**. If for any reason you cannot take the final exam as scheduled, you must submit a written request to Dr. Boerner to take this exam at a different time, and must justify this request with a reasonable academic argument. Conflicts with airline reservations or vacation trips do not constitute reasonable academic arguments. All such requests must be submitted before the end of the seventh week of the quarter.

Earning Final Grades

The following grading scale will be used to determine the final grade you have earned:

≥93%=A	90-92%=A-	87-89%=B+	83-86%=B	80-82%=B-
77-79%=C+	73-76%=C	70-72%=C-	60-69%=D	≤59%=E

FREQUENTLY ASKED QUESTIONS (FAQs):

Will lecture attendance be used in the grading scheme? Frankly, I hope everyone will attend all lectures. Material will be covered in lecture that is not available either in the textbook or the manual, and that alone should be sufficient for you to attend lecture on a regular basis. However, lecture attendance will not be used explicitly in the grading process, and attendance will not be taken in lecture.

Do I really need to do the readings in the textbook? The goal of this course is to give each and every student a broad and comprehensive introduction to the discipline of ecology at all levels of ecological hierarchy and for all groups of organisms. We feel the combination of the textbook readings, the seminars you attend, and the lectures can achieve this. Most of the lecture time will be devoted to principles and concepts, with examples presented as time permits. Your assigned readings will supply a wealth of additional examples and explanations to complement what is presented in lecture. Your textbook will also cover topics that are central to the course but will not be presented in lecture due to time constraints. For you to actually achieve the goals of this course, you will need to put in the time and effort to master the information and examples presented in both the lecture and the textbook. Neither is sufficient in the absence of the other, and both will be tested on the exams.

Is there enough detail in the lecture outlines and other supplements on Carmen for me to pass the exams without attending lecture? The outlines and supplemental materials in the lecture manual are designed to make it easier for you to take comprehensive notes during lecture. They are not a substitute for careful attention and note-taking in lecture. The questions on the three exams will often deal with examples and ideas presented in lecture but neither explicitly explained on the lecture outline nor presented in your textbook. As a result you (as the student) must be a conscientious recorder. Be sure the information you write in your notes is legible, complete, and correct. Just five minutes spent after each lecture reviewing your notes of the day will improve information content tremendously. How many times have you thought to yourself "I know I understood this concept when it was presented in lecture; at the time, it

seemed so simple and logical. Why don't my notes make sense now...the night before the exam?" By writing a few more lines in the margins of your notes, expanding on this or that point, you can more easily interpret your notes at exam time...and score higher on exams.

Are there specific learning objectives for the course listed anywhere? We have formatted the learning objectives of this course as "study questions". You can find the learning objectives/study questions on Carmen.

What do I do if I miss lecture? Please realize that lecture notes are indispensable at exam time. If you do miss because of illness, be sure to get notes from a classmate. Lecture notes will not be posted on Carmen or be available from the instructors. To help guide you in your note taking, lecture outlines are provided on Carmen, and lists of study questions for each exam follow the outlines for the group of lectures covered on each exam. In addition, your textbook presents lists of major concepts at the beginning of each chapter. These are an excellent guide to what both the authors and your instructors want you to learn from each chapter.

Is the final exam comprehensive? No! The exam given during exam week covers the last 1/3 of the course and is similar to the other two exams in length, depth, breadth, and structure.

What are research seminars, and how do I find them? Research seminars are sessions of 35-50 minutes during which someone presents the results of research they have accomplished or are currently conducting. Speakers may be graduate students, postdoctoral researchers, OSU faculty, or visiting scientists. Many departments and programs have weekly seminar series, and a partial listing of those that typically include ecological topics is posted for you on Carmen. Seminar schedules for the quarter and fliers advertising individual seminars are posted in buildings in which the various departments and programs are housed and on department and on college web sites.

What if I can't make any of the scheduled seminars because of work or personal conflicts? Attending seminars and writing comprehensive seminar summaries are essential components of the learning strategies being employed in this course. Given the diversity of days and times at which seminar programs are offered we do not feel it is unreasonable to expect students to find times in their schedules to attend them. If a student's combined course load and outside employment or other commitments make it impossible to meet course requirements, the student must find a way to reduce one or the other, or drop the course. Dr. Boerner will not offer alternatives to this portion of the course requirements. If this is a major problem for you, please be aware that not all of the offerings of EEOB 503.01 require seminar summaries; some require full research papers instead.

What should I do if I feel I need some accommodation to allow me to succeed in this course? Anyone who feels they may need an accommodation based on a special need should contact Dr. Boerner to arrange an appointment as soon as possible after the beginning of the quarter. At that time we can discuss the course format, anticipate your needs, and explore potential adaptations to meet your needs. We rely on the Office for Disability Services for assistance in verifying the need for accommodations and developing accommodation strategies. If you have not previously contacted the Office for Disability Services, please do so. Note: The syllabus, lecture manual, and exams can be made available in alternative media, given advanced notice and documentation from ODS.

What should I do if I'm having difficulty with the amount and/or type of writing that's required in this course? We recommend you make use of the OSU Writing Center. The OSU Writing Center is a place where students, faculty, staff, and alumni can receive free, individual consultations on any piece of writing. The Writing Center can help with traditional writing assignments like research reports and essays, but you can also work on lab reports, personal statements, resumes, job letters, and even screenplays. Graduate Associates from a variety of disciplines staff OSU's Writing Center. The Writing Center works on an appointment basis. Appointments last approximately 50 minutes and start on the half hour (e.g., 8:30, 9:30, etc.). Call 688-4291 or stop by room 485 Mendenhall Lab to schedule an appointment.

ANTICIPATED SCHEDULE OF LECTURES AND ACTIVITIES

DATE	ACTIVITY	TOPIC	TEXT READING
Thurs, 9/25	Lecture	Why and How to do Ecology	Ch. 1
9/25-9/26	Recitation	No recitations during week 1	
		Physiological & Behavioral Ecology:	
Tues, 9/30	Lecture	Water	Ch. 5, Ch. 15 (349 - 352)
Thurs, 10/2	Lecture	Physiological & Behavioral Ecology: Heat	Ch. 4
9/30-10/3	Recitation	Seminars: schedules, summaries, etc.	
Tues, 10/7	Lecture	Physiological & Behavioral Ecology: Light	Ch. 6 (134-138, 146)
Thurs, 10/9	Lecture	Evolutionary Aspects of Ecology	Ch. 8
10/7-10/10	Recitation	Anatomy of a Scientific Paper	
Tues, 10/14	Lecture	Social Behavior	Ch. 7
Thurs, 10/16		First Exam (lectures and readings of 9/25-10/9)	
10/14-10/17	Recitation	Review for Exam I	
Tues, 10/21	Lecture	Ecology of Populations I	Ch. 9, Ch. 10
Thurs, 10/23	Lecture	Ecology of Populations II	Ch. 11, Ch. 12
10/21-10/24	Recitation	Population Growth Exercises	
		Competition (First Seminar Summary Due)	Ch. 13
Tues, 10/28	Lecture		
Thurs, 10/30	Lecture	Predation, Parasitism, and Mutualism	Ch. 14, Ch. 15
10/28-10/31	Recitation	Lotka-Volterra Exercises	
Tues, 11/4	Lecture	Community Structure and Diversity	Ch. 16
Thurs, 11/6	Lecture	Why and How Communities Change I	Ch. 17
11/4-11/7	Recitation	Review for Exam II	
Tues, 11/11		Veteran's Day, no classes	
Thurs, 11/13		Second Exam (lectures and readings of 10/14-11/4)	
11/11-11/14	Recitation	Introduction to Statistical Analysis	
Tues, 11/18	Lecture	Why and How Communities Change II	Ch. 20
Thurs, 11/20	Lecture	Primary Production and Energy Flow	Ch. 18
11/18-11/21	Recitation	(Second Seminar Summary Due) Ecosystem Services Exercise	
Tues, 11/25	Lecture	Element Cycling and Retention I	Ch. 19
Thurs, 11/27		No Class, Thanksgiving Holiday	
11/25-11/28	Recitation	No recitations this week	
		Element Cycling and Retention II (Third Seminar Summary Due)	Ch. (463-464)
Tues, 12/2	Lecture	Climate Drivers and Ecosystem	
Thurs 12/4	Lecture	Geography	Ch. 2, Ch. 3
12/2-12/5	Recitation	Review for Exam III, Student Evaluations	
Wed 12/10, 7:30 AM		Third Exam (lectures and readings of 11/6-12/4)	

LABORATORY

LABORATORY SECTION MEETING TIMES:

Wednesday 8:30-12:18

Wednesday 12:30-4:18

Thursday 11:30-3:18

Friday, 8:30-12:18

All laboratory sections meet in 130 Jennings Hall (corner of 12th and Neil), room 130

REQUIRED TEXTS:

Boerner, R.E.J. and S.A. Ludsin 2008. *EEOB 413.02 Laboratory Manual*. Available at UniPrint on Tuttle. Important Note: Used copies of the lab manual are not acceptable as they will be missing the report sheets and will not contain all of the exercises present in this edition of the manual.

Day, R.A. and B. Gastel. 2006. *How to Write and Publish a Scientific Paper*, 6th Edition. Oryx Press, Westport, CT. (Available at the OSU Bookstore and associated stores)

LEARNING OBJECTIVES:

The student who successfully completes this course should be able to

- Understand some of the basic experimental designs and procedures used in ecological studies;
- Understand basic statistical procedures, know when various statistical tests are appropriate, and know how to interpret the results of basic inferential tests;
- Develop life tables from field data and interpret them in terms of population trajectory;
- Operate computer simulation models of landscape structure, and logistic population growth, and interpret their results in terms of real-world applications;
- Use the logistic growth model to solve applied problems;
- Write a research report in the form used by scientists in academia, public service, and private industry;
- Do effective peer reviews of drafts of scientific papers and make use of peer reviews in improving one's own drafts.
- Work more effectively in research teams and understand better the dynamics that both improve and hinder group research.

POLICIES AND PROCEDURES

Course Structure: EEOB 503.02 has a single, four hour laboratory meeting per week. Reading assignments for the laboratories are all from the laboratory manual and the required text.

The laboratory experiences are designed to complement and extend the material covered in the lecture course EEOB 503.01, and will include simple experiments, demonstrations, problems, and writing of scientific papers. Most exercises will require further data analysis, and written submissions ranging from brief summaries to full scientific papers will need to be prepared outside of class.

Most of the laboratory experiences contained in this manual follow a consistent format:

- 1) A background segment that provides the ecological theory and relevant information you will need to place that laboratory experience into the larger, ecological context;
- 2) A general methods section that provides the “big picture” of what we hope to achieve during that lab exercise;
- 3) A set of detailed, step-by-step instructions of what you are to do during the lab.

The laboratory grade will be calculated on the basis of the following criteria: 1) weekly lab write-ups, 2) a scientific paper based on one of your experiments, and 3) participation.

1) **Weekly Lab Write-ups:** Most labs will include a written assignment summarizing the lab exercise in a form that represents the Results and Discussion sections of a traditional scientific paper. Your Lab Instructor will tell you more about each assignment as it approaches.

2) **Scientific Paper:** You will write a full scientific report covering the Competition Experiment. To help you learn the basics of technical writing, you will submit first drafts of the various parts of the first report for peer-review and you will also do peer-reviews of a classmate’s draft.

3) **Participation:** If you wish to understand the relationships between organisms and their environment, it is essential that you attend class and participate fully in all experiments and discussions. Your peer review of a classmates’ scientific paper draft will also be important in both your learning and that of your classmates. Your Lab Instructor will assess your participation on an on-going basis, and meet with you to discuss it if he/she feels you are not participating up to expectations. Anyone missing three laboratory periods for reasons other than those deemed appropriate by University rules will be assigned a grade of E for the course regardless of points accumulated.

Late assignments: Assignments are due at the beginning of the class period on the date indicated on the course schedule, and assignments turned in after the class will be considered late. Assignments submitted late will have 10% of the maximum possible points deducted per day late. For example, a student who turns in a 50-point assignment two days late will be able to earn a maximum of 40 points. If you think you will have trouble turning in an assignment on time, discuss the situation with your Lab Instructor as soon as you can.

Sharing lab report data: Often laboratory exercises involve group participation while conducting experiments and collecting data. During this part of the process we encourage active participation and discussion among students; however, unless otherwise specified by

your instructor, *preparing (i.e., writing, graphing, etc.) laboratory reports must be an individual exercise.* This practice is designed to ensure that each student takes an active role in analyzing data, graphing results, and interpreting his/her results in writing. Your Lab Instructor will not accept laboratory reports that have been prepared as a group effort unless you have been given specific directions to do so for that specific report.

If you have any questions, feel free to call or email your Lab Instructor. Better yet, drop by his/her office and he/she will work to answer any and all of your questions. The Lab Instructors will work to make the laboratory portion of the course a good learning experience, as well as an enjoyable one.

What is the course policy on Academic Misconduct? You are responsible for completing your academic assignments on your own; there are no assignments, exams, or seminar summary requirements in EEOB 503.01 that can or should be completed as a group exercise. Examples of plagiarism and other forms of academic misconduct are given in the code of student conduct, and it is the responsibility of all OSU students to understand what actions might be construed as academic misconduct. Any and all suspected incidents of academic misconduct in EEOB 503.01 and EEOB 503.02 will be forward to the OSU Committee on Academic Misconduct for adjudication. There will be no exceptions.

What is the course policy concerning diversity? The instructors of this course are committed to promoting a welcoming climate for all students. For more information on diversity, see the EEOB (<http://www.biosci.ohio-state.edu/~eeob/diversity/>) or OSU (<http://www.osu.edu/diversity/>) websites. The instructors welcome suggestions, questions, and comments. Any exchange of ideas will be conducted with confidentiality, safety, and respect as guiding principles.

Accommodation:

Anyone who feels he/she may need an accommodation based on the impact of a disability or other special need should contact his/her Lab Instructor to arrange an appointment as soon as possible. At the appointment we can discuss the course format, anticipate your needs, and explore potential adaptations to meet your needs. We rely on the Office for Disability Services for assistance in verifying the need for accommodations and developing accommodation strategies. If you have not previously contacted the Office for Disability Services, we encourage you to do so.

Sexual Harassment:

OSU and EEOB consider harassment on the basis of gender or sexual orientation to be unacceptable behavior that destroys opportunities for learning. While all members of the staff involved in this course have been trained in the OSU sexual harassment policies and procedures, this is not true for all OSU students. Please report any concerns about questionable or unwanted behavior to Dr. Boerner. For more information, go to <http://hr.osu.edu/cst/sexualharassment.htm>

Alternate Materials: This manual can be converted to alternate materials for those who require. Please notify us if you require this service and give us sufficient time to prepare them.

LABORATORY GRADES

Assignment	Format	Points
------------	--------	--------

Literature Search Exercise	Individual	15
Vegetation Analysis Report	Group	50
Corridors and Stepping Stones Report	Group	25
Human Demography Report	Group	25
Fire and Ohio Landscape Report	Group	25
Competition Interim Assignment	Individual	15
Competition Report: Introduction & Methods Draft	Individual	15 ¹
Competition Report: Results & Discussion Draft	Individual	15 ¹
Final Competition Scientific Paper	Individual	50
Lab and Group Participation	Individual	15 ²
Total Points Available (250 individual, 250 group)		250
¹ 7.5 points for your draft, 7.5 points for peer-reviews		
² assigned by the lab instructor		

LABORATORY SCHEDULE AND READING ASSIGNMENTS

Lab Week	Dates	Activities and Assignments Due	Required Reading
Week 1	W 9/24 - F 9/26	Course Orientation; Anatomy of A Scientific Paper, Part I; How to Read A Scientific Paper;	Course Syllabus; LM, pp. 3-4; D, pp. 3-10, 56-65
Week 2	W 10/1 - F 10/3	Begin Competition Experiment; Anatomy of a Scientific Paper, Part II; Literature Search Exercise	LM, pp. 5-9; D, pp. 66-98, 185-205
Week 3	W 10/8 - F 10/10	Vegetation Analysis Experiment; (Field Trip to West Campus Woods); <i>Due: Literature Search Exercise</i>	LM, pp. 10-36
Week 4	W 10/15 - F 10/17	Statistical Analysis of Ecological Data; Introduction to Excel; <i>Due: Nothing (but don't get used to it)</i>	LM, pp. 37-45
Week 5	W 10/22 - F 10/24	Corridors, Stepping Stones, & Butterflies; <i>Due: Vegetation Analysis Report</i>	LM, pp. 55-60
Week 6	W 10/29 - F 10/31	Human Demography; (Field Trip: Green Lawn Cemetery); <i>Due: Corridors Report</i>	LM, pp. 46-54
Week 7	W 11/5 - F 11/7	Fire and the Ohio Landscape; <i>Due: Demography Exercise</i>	LM, pp. 61-71
Week 8	W 11/12 - F 11/14	Competition Experiment Harvest; <i>Due: Ohio Landscape Report; Due: Competition Pre-Harvest Exercise</i>	LM, pp. 72-79
Week 9	W 11/19 - F 11/21	Statistical Analysis of Competition Experiment Data; Peer Reviews, Part I; <i>Due: Draft of Introduction and Methods sections of competition report</i>	D, pp. 250-255; LM, p. 80
Week 10	W 12/3 - F 12/5	In-class Peer Reviews, Part II; <i>Due: Draft of Results and Discussion sections of the competition report</i>	
Exam Week	T 12/9, noon	<i>Due: Final Competition Report</i>	

***LM denotes readings from the EEOB 503.03 Lab Manual and DY denotes reading from Day (1998) How to Write and Publish a Scientific Paper.**