Syllabus for
BIO 312—Ecology Laboratory
1.0 Credit Hour
Spring 2012

I. COURSE DESCRIPTION

Field and lab investigations of both terrestrial and aquatic ecosystems on a quantitative basis. (One 4-hour lab period per week).
Corequisite: BIO 312 Lecture.
Lab fee: $50.00.

II. COURSE GOALS

Ecology laboratory is designed to give the student personal experience using scientific methods appropriate to any educated citizen active in community environmental concerns. Actual field and laboratory experiences are also necessary for proper interpretation of information obtained from books, journals, speakers, and the news media. Furthermore, most of the field experience with the Father's world in this course is directly applicable to service with scouts, Royal Rangers, Royal Ambassadors, summer camp counseling, mission work, teaching, and citizen investigations of local environmental problems. Ecology is one more tool to help the student carry out the ORU goal of helping meet other people's needs. And, should the student choose it as his or her vocation, ecology helps meet the student's own needs for employment and research.

Consequently, Ecology Lab is much more than a series of routine lab exercises with foreknown results or even a series of "show and tell" field trips. Quantitative problems and procedures help students handle the increased variability which organisms exhibit beyond that found in chemical and physical systems.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

A. Objectives

As a result of successfully completing this course, the student will be able to do the following:

1. Assimilate and order information from a wide spectrum of fields.
2. Independently make observations and interpretations of organism environment relationships.
3. Analyze data statistically and graphically.
4. Demonstrate skills in the basic ecological investigative techniques included in this course.
5. Identify the major groups and their respective dominant members in local terrestrial and aquatic ecosystems.
6. Write reports that are neat, legible, well organized, grammatically correct, interesting, and ecologically sound.
7. Effectively use field guides and technical manuals to identify specimens of common plants and animals.
8. Collect, pin, and identify some common insects.
9. Enjoy participating in the Oklahoma Academy of Science field meeting.
10. Apply the skills acquired in this course to meeting the needs of oneself and others.

B. Objectives for Students in Teacher Preparation Programs

The Teacher Preparation Program meets the competency-based requirements established by the Oklahoma Commission on Teacher Preparation. This course meets the following competencies: Subject Competencies (SC) 7.b.3, 7.b.4, and 7.b.9.

This course is designed to help students meet these subject competencies:

SC 7.b.3: Is able to teach with a broad understanding of all content areas and understand the interaction between the sciences and the process skills as it relates to Life Science Content: Regulation and behavior.

SC 7.b.4: Is able to teach with a broad understanding of all content areas and understand the interaction between the sciences and the process skills as it relates to Life Science Content: Population and ecosystem.

SC 7.b.9: Is able to teach with a broad understanding of all content and understand the interaction between the sciences and the process skills as it relates to Life Science Content: The interdependence of organisms.

IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

A. Required Textbook

Darnell, R.M. 1971. Selected Exercises from Organism and Environment: A Manual of Quantitative Ecology. San Francisco: W.H. Freeman and Company. Reproduced by permission of the author. ISBN not applicable.

B. Optional Textbooks and/or Reading Material

Peterson's Field Guides (available in local bookstores)

C. Optional/Recommended Materials

1. Field Notebook (any notebook to take field notes, such as a 5 x 7 inch spiral bound notebook).
2. Pocket calculator.

V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.
2. Students taking a late exam because of an unauthorized absence are charged a late exam fee.
3. Students and faculty at Oral Roberts University must adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, electronic, video, multimedia, or computer software. Plagiarism and other forms of cheating involve both lying and stealing and are violations of ORU's Honor Code: "I will not cheat or plagiarize; I will do my own academic work and will not inappropriately collaborate with other students on assignments." Plagiarism is usually defined as copying someone else's ideas, words, or sentence structure and submitting them as one's own. Other forms of academic dishonesty include (but are not limited to) the following:
   a. Submitting another's work as one's own or colluding with someone else and submitting that work as though it were his or hers;
   b. Failing to meet group assignment or project requirements while claiming to have done so;

c. Failing to cite sources used in a paper;
d. Creating results for experiments, observations, interviews, or projects that were not done;
e. Receiving or giving unauthorized help on assignments.

By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronic verification or by other means. Penalties for any of the above infractions may result in disciplinary action including failing the assignment or failing the course or expulsion from the University, as determined by department and University guidelines.

4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.
5. Students are to be in compliance with University, school, and departmental policies regarding the Whole Person Assessment requirements. Students should consult the Whole Person Assessment handbooks for requirements regarding general education and the students' majors.
   a. The penalty for not submitting electronically or for incorrectly submitting an artifact is a zero for that assignment.
   b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.

B. Course Policies and Procedures

1. Evaluation Procedures

a.

Type of Work	Points
Laboratory exercises & reports (1 @ 100 and 4 @ 50)	300
Insect Collection	150
Lab Practical & Field Notebook	50
Total	500

b. Grading

Letter Grade	Percent
A	>90.0
B	80-89.9
C	70-79.9
D	60-69.9
F	<59.9

2. Whole Person Assessment Requirements

A lab report from this lab course can be used to satisfy one of your departmental Whole Person Assessment requirements.

3. Other Policies and/or Procedures
   a. Insect Collections
      1. The student is required to submit a collection of at **least ten** (10) **orders** and **twenty** (20) **families** of insects containing at **least** one specimen from each order that is properly mounted and labeled, as prescribed in "How to Know the Insects" or "Field Guide to the Insects." The field notebook, with descriptions of each habitat where specimens were collected, will be turned in with the student's collection. The completed collection is due on the assigned date. Late collections will lose ten (10) points per

day after the due date. Students wishing to keep their collections may do so by paying $5.00 for each insect box.

2. Grading are as follows:

Orders:	l0x5 pts./Order =	50 pts.
	(+2 pts. for each additional Order up to 3 extra)	
Families:	20x2.5 pts./Family =	50 pts.
	(+l pt. for each additional Family up to 4 extra)	
Format:	Neatness, proper pinning method, proper phylogenetic order, proper insect and moth wing mounts, etc.	25 pts.
Notebook:	Thorough field notes on where (i.e., specific locality like "under rock on shore of lake") and when each insect was collected, environmental conditions (e.g., temperature and wind), etc.	25 pts.
	TOTAL	150 pts.
	(Max. = 155 points with extra credit)	

b. Format for Lab Reports

Note: Students should follow these directions carefully.

1. **Title** of lab (with exercise number if appropriate), your name, date.
2. **Introduction** (1/2 to 5 pp.)
   At least two paragraphs (about one to two pages) introducing lab with general information, include pertinent figures, and cite references about subject matter (e.g., lakes in general). State the **purpose** (past tense) of the lab and the hypothesis (if applicable) near the end of the Introduction. Include figures if possible. Keep wording in past tense whenever appropriate.
3. **Materials and Methods** (1/2 to 2 pp.)
   If field trip, state location and include a trail or route map as a figure. Refer to pages in lab manual if used (don't repeat what is already there), but state modifications.
4. **Results** (1 to 10 pp.)
   If a field trip, list weather conditions (air temp., wind speed and direction, humidity, and % cloudy). If an exercise where you have data, first list all figures and tables by number and brief title, then include all figures and tables on the following pages (before the Disc.). List each by a separate number and with a caption and reference (in parentheses).
5. **Discussion** (1 to 6 pp.)
   Discussion of Results—interpret all data gathered, give opinion (as an educated scientist) of what happened or was seen and why. Be sure to cite references that support or contradict the results and interpretations. Answer any pertinent questions in lab manual. **Note**: You can combine Results and Disc. sections for Oxley and Zoo reports.
6. **Conclusion** (0.5 pg.)
   Briefly discuss the overall results of the lab, your views on if

you liked it or learned anything, how the exercise could be improved, etc.

7. **References Cited**

   Cite at least two references (other the than lab manual). Go to the library, look up the topic, use the lecture text, use the Internet, and/or use Dr. Korstad's library. Be sure to cite at least 4 "good" references per lab report.

   Proper format:

   Book: Smith, R.L. and T.M. Smith. 2001. Ecology and Field Biology, 6th ed. Harper & Row.

   Article: Edmondson, W.T. 1985. The limnology of lakes in Washington. Limnology and Oceanography 27: 195-196.

   Internet: Anonymous. 2005. Oxley Nature Center map. www://oxleynaturecenter.org

8. All lab reports must be typed on a computer (e.g., MS Word). Use a spell-checker! **Use only metric units** (convert if necessary). Double space and **number each page** in the top right-hand corner. Staple the final report in the top left-hand corner. No plastic covers or other binding necessary.
9. Print two-sided if possible). Color figures are optional except needed for lake graphs of Temp., DO, & Light vs, Depth).
10. Late reports: 5% penalty per day!
11. Look at old lab reports in GC 1B11 for good examples of what to do. You should also check helpful information on the class' D2L webpage.
12. Submit all reports to the respective Lab D2L Dropbox for plagiarism check by Turnitin.com. No final report will be accepted with an 'Originality Report' greater than 20% (excluding quotes and bibliography), so revise and resubmit by the deadline as appropriate!

VI. COURSE CALENDAR

FT = Field trip; wear field clothes & shoes

* = Reports worth 50 points each

** = Ex. 23 and 21 together are worth 100 points (This report must be typed and graphs done on computer)

(C) = Bring calculator to lab

WEEK	DATE	EXERCISE
1		Orientation
2		Discussion of the Use of Statistics in Biological Research lab (lab report not due until Week 4)
3		Ex. 12, Population Sampling*(C)
4		Ex. 21, Comparison of Plankton Communities**
5		Tulsa Zoo* (FT)
6		Oxley Nature Center* (FT)
7		Ex. 23, Lakes (FT to Lake Evelyn)**
8		Ex. 23, Lakes cont'd (FT to Wakefield Pond & Five Oaks Lake)**
9		Insect Collecting (Local FT)
10		Turkey Mtn (FT)
11		Red Bud Valley (FT)
12		Optional FT to collect insects
13		Lab Work on insect collections (Collections due 3 p.m. Mon. of next week)
14		Lab Evaluations and Cleanup

Course Inventory for ORU's Student Learning Outcomes

Ecology Laboratory – BIO 312
Spring 2012

This course contributes to the ORU student learning outcomes as indicated below:
Significant Contribution – Addresses the outcome directly and includes targeted assessment.
Moderate Contribution – Addresses the outcome directly or indirectly and includes some assessment.
Minimal Contribution – Addresses the outcome indirectly and includes little or no assessment.
No Contribution – Does not address the outcome.

The Student Learning Glossary at http://ir.oru.edu/doc/glossary.pdf defines each outcome and each of the proficiencies/capacities.

OUTCOMES & Proficiencies/Capacities	Significant Contribution	Moderate Contribution	Minimal Contribution	No Contribution
1	**Outcome #1 – Spiritually Alive** Proficiencies/Capacities				
1A	Biblical knowledge			X	
1B	Sensitivity to the Holy Spirit			X	
1C	Evangelistic capability			X	
1D	Ethical behavior			X	
2	**Outcome #2 – Intellectually Alert** Proficiencies/Capacities				
2A	Critical thinking		X		
2B	Information literacy		X		
2C	Global & historical perspectives		X		
2D	Aesthetic appreciation			X	
2E	Intellectual creativity		X		
3	**Outcome #3 – Physically Disciplined** Proficiencies/Capacities				
3A	Healthy lifestyle			X	
3B	Physically disciplined lifestyle			X	
4	**Outcome #4 – Socially Adept** Proficiencies/Capacities				
4A	Communication skills		X		
4B	Interpersonal skills		X		
4C	Appreciation of cultural & linguistic differences			X	
4D	Responsible citizenship		X		
4E	Leadership capacity		X		