

**BIOLOGY 270L**  
**INTRODUCTION TO ENVIRONMENTAL BIOLOGY LABORATORY**

**BULLETIN INFORMATION**

BIOL 270L: Introduction to Environmental Biology Laboratory (1 credit hour)

**Course Description:**

Demonstrations, data analyses, discussions, and films relating to human ecology, resource use, and environmental impact. Not for major credit

Co-requisite: Prereq or coreq: BIOL 270

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Note: Two hours per week.

**SAMPLE COURSE OVERVIEW**

BIOL 270L is an introductory-level biology lab course for non-majors. Together with BIOL 270, the prerequisite or co-requisite, BIOL 270L aims to provide a basic overview of ecological processes that will generate a basis for understanding modern environmental issues and their importance to contemporary society. Students will have the opportunity to learn basic ecological processes and the effects of human population growth and technology through laboratory exercises, data analyses, discussions, and research. BIOL 270L emphasizes the scientific inquiry as a method of understanding the natural world and focuses on the use of experimental design and technology to solve questions of environmental function. Additionally, the importance of biological scientific literacy to understanding and analyzing the impact of contemporary issues such as water supply and quality, energy, world population growth, sustainability, and climate change to human health and welfare will be emphasized.

**ITEMIZED LEARNING OUTCOMES**

**Upon successful completion of Biology 270L, students will be able to:**

1. Distinguish scientific inquiry from other legitimate methods of inquiry and to recognize the difference between scientifically legitimate inquiry and claims without a sound scientific basis.
2. Apply statistical and quantitative approaches to analyze data
3. Demonstrate understanding of the scientific method
4. Explain the basics of experimental design and hypothesis testing
5. Collect and properly handle environmental samples
6. Explain measurement error and the difference between precision and accuracy
7. Use simple population models to forecast growth and understand the consequences of changing demographic parameters

**SAMPLE REQUIRED TEXTS/SUGGESTED READINGS/MATERIALS**

1. Lab Manual: Morris, J.T. 2011. *Biology 270 Laboratory Manual*

### **SAMPLE ASSIGNMENTS AND/OR EXAMS**

1. The laboratory includes short lectures, independent individual or group work, videos, demonstrations, and discussions.
2. Oral presentations and participation in discussions
3. Written laboratory reports
4. Other written assignments, graphs, quizzes, bibliographies etc.
5. Attendance

### **SAMPLE COURSE OUTLINE WITH TIMELINE OF TOPICS, READINGS/ASSIGNMENTS, EXAMS/PROJECTS**

**Week 1:** Introduction to the Course  
Laboratory Information

**Week 2:** Problems of the “Hidden City”  
Questions for reflections and discussion

**Week 3:** Basic Skills Laboratory: Introduction to Statistics  
The means and measures of central tendency  
Standard deviation: A measure of dispersion around the mean  
Test your understanding: questions for review  
Laboratory exercises on statistics  
Test your understanding: questions for review  
Laboratory exercise on statistics: human allometry  
References and further reading

**Week 4:** Basic Skills Laboratory: Introduction to EXCEL 2000  
Using EXCEL to analyze data on the PC  
Getting into EXCEL 2000  
Analysis of human allometry data  
Graphical presentation and interpretation of the results

**Week 5:** Darwin’s Voyage  
Who was Charles Darwin?  
Darwin and the Theory of Evolution  
The Controversy Over Evolution  
How to read the *Autobiography*  
Conclusions  
Questions for Review and Study  
Group assignments  
A Partial Annotated Bibliography of Books by Charles Darwin  
References Cited and Suggested Reading

- Week 6:** Gray Water Bioassay Experiment  
Our Experiment  
Methods  
Data analysis  
Assignment  
Seed Germination Data Sheet
- Week 7:** A Discussion of China's Only One Child Program
- Week 8:** World Population Simulation Games  
The Default Simulation  
Step through One Year at a Time  
Changing the Parameter Values
- Week 9:** The Trial  
Trial format  
Trial topics
- Week 10:** Collection and Investigation of Local Water Samples  
In-lab work  
The Great Oyster Experiment
- Week 11:** Radiation Laboratory Exercise: Part I  
Introduction: Characteristics of radiation  
Instructions for using the AW-SRAD radiation monitor  
The effect on different blocking materials on the penetration of radiation
- Week 12:** Radiation Laboratory Exercise: Part II  
Determination of the inverse square relationship  
A review of the concept of half-life  
Assignment: radiation homework sheet
- Week 14:** Conclusion