

Revised: Fall 2016

BIO 271

Introduction to Ecological Systems

COURSE OUTLINE

Prerequisites:

BIO 101

Course Description:

This course examines the basic biological, meteorological and geologic factors at play in determining various critical ecosystems. Emphasis will be on wetlands and wetlands restoration, endangered and threatened species habitat and aquatic systems (in particular, streams). Remote sensing technology and the use of GIS in ecological management will be examined.

Semester Credits: 4 Lecture Hours: 3 Lab/Recitation Hours: 3

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Course Outcomes

At the completion of this course, the student should be able to:

1. Describe how large scale patterns of climatic variation in conjunction with geology and soils produce the diversity of ecosystems found on Earth.
2. Explain patterns of species abundance and diversity, succession and the interactions among species and how these ecological concepts relate to biodiversity.
3. Describe the trophic structure of communities, particularly wetlands and aquatic systems.
4. Demonstrate an understanding of the basic patterns of energy flow in ecosystems and be able to discuss differences in nutrient cycling between terrestrial and wetland ecosystems.
5. Discuss how island biogeography concepts relate to endangered and threatened species habitat.
6. Conduct preliminary wetland investigations, stream assessments and natural resources inventories using a combination of field observations and GIS data.
7. Explain how remote sensing and GIS data are used to assess the state of various ecosystems in the United States and manage natural resources.

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Textbooks:

The State of the Nation's Ecosystems: (2008) Measuring the Lands, Waters, and Living Resources of the United States, The H. John Heinz, III Center for Science, Economics, and the Environment, Current Edition, Cambridge University Press. ISBN 9781597264716

In search of Swampland: A Wetland Sourcebook and Field Guide (2005), Ralph W. Tiner, Second Edition, Rutgers University Press. ISBN 9780813536811

A Guide to Common Freshwater Invertebrates of North America (2002), J. Reese Voshell, Jr., Current Edition, McDonald and Woodward Publishing Company. ISBN 9780939923878

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Week	Topics	Chapter(s)
#1	Orientation/Introduction to Course State of Nation's Ecosystems	Syllabus Heniz—Chapters 1
#2	Core National Indicators	Heniz—Chapter 2
#3	Farmlands	Heniz—Chapter 4
#4	Farmlands (cont.) Forests	Heniz—Chapter 4 Heniz—Chapter 5
#5	Forests (cont.)	Heniz—Chapter 5
#6	Fresh Waters	Heniz—Chapter 6
#7	Grasslands and Shrublands Urban & Suburban Lands	Heniz—Chapter 7 Heniz—Chapter 8
#8	Wetlands—Definition and Formation	Tiner—Chapters 1 & 3
#9	Wetlands Hydrology Hydric Soils	Tiner—Chapter 2 Tiner—Chapter 4
#10	Hydrophytic Vegetation Wetland Functions and Values	Tiner—Chapter 5 Tiner—Chapter 6 & 7
#11	Wetlands Types Wetlands: Wastelands and Watery Wealth	Tiner—Chapters 13 & 14 Tiner—Chapters 8 & 9
#12	Freshwater Invertebrates	Voshell—pp. 1-55
#13	Stream Monitoring Field Trip	Voshell – for ID and ecology
#14	Water Quality Monitoring Stream Monitoring Field Trip	Assigned Readings
#15	Stream Monitoring (Rain Date)	Assigned Readings
Final Comprehensive Exam		

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Notes to Instructors

1. Departmental policy dictates that instructors do not allow students to keep tests.
2. A comprehensive final exam counting 15% - 20% of the total grade will be given at the end of the semester.
3. Syllabus should state what the course grade will be based on, such as tests, quizzes, a comprehensive final exam, and any other assignments made by the instructor.
4. The VWCC Biology Department uses a 10 point grading scale.

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