

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON



COURSE OUTLINE

Course Title: ECOLOGY

Code No.: NRT109 Semester: II

Program: FORESTRY, FISH & WILDLIFE, PARKS & OUTDOOR RECREATION

Author: Jerry A. Zuchlinski, M.Sc.

Date: JAN. 1999 Previous Outline Date: None

Approved

 Dean, Natural Resources

 ^ ^ ^ f/T
Date

Total Credits: 3 Prerequisite(s):
Length of Course: 3 hr/week X 16 weeks
Total Credit Hours: 48

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For additional information, please contact Joe Fruchter, Dean, School of Natural Resources, (705) 759-2554, Ext 688

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I. COURSE DESCRIPTION:

This is an introductory course to provide students with an understanding of ecology as it relates to people who work in the field of natural resources. The course covers a wide range of topics that examine the interactions between plants and animals and their physical environment. A combination of lectures, labs and field surveys provide insight into the structure and function of ecosystems in general; but emphasize forest and freshwater ecosystems in Canada.

ii. LEARNING OUTCOMES AND ELEMENTS OF PERFORMANCE:

A. Learning Outcomes

1. Identify the 6 attributes of an ecosystem and describe their significance.
2. Examine the role of bacteria as they relate to the structure and function of ecosystems.
3. Discuss the concepts of niche and habitat.
4. Examine the flow of energy in ecosystems.
5. Examine the cycling and role of nutrients.
6. Discuss the role of major abiotic factors in natural ecosystems.
7. Discuss various general characteristics of populations.
8. Discuss characteristics of community structure and species interaction.

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B. Learning Outcomes with Elements of Performance:

Upon successful completion of this course the student will demonstrate the ability to :

L Identify the 6 attributes of an ecosystem and describe their function.

Elements of the performance:

distinguish between biotic and abiotic components of an ecosystem

describe trophic relationships between autotrophs, heterotrophs, and decomposers and their roles in energy transfer and material movement

identify the 3 major abiotic components of ecosystems and their contribution to ecosystem function; including; inorganic material, organic material and climatic factors

demonstrate an understanding of complexity; interaction and interdependency; lack of spatial dimension and ecosystem dynamics as they relate to ecosystem structure and function

This learning outcome will constitute 10% of the course's grade,

2. Examine the role of bacteria as they relate to the structure and function of ecosystems.

Elements of the performance:

describe the characteristics of bacteria

demonstrate techniques for the identification of bacteria including gram staining, culture of agar plates, microscopic examination of colony characteristics

discuss the importance of various groups of bacteria in relation to decomposition and nutrient cycling, as pathogens and as chemo and photoautotrophs

This learning outcome will constitute 10% of the course's grade.

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3. Discuss the concepts of niche and habitat.

Elements of the performance:

define niche and habitat

provide examples of terrestrial and aquatic habitat variation and how organisms adapt to occupy specific niches

This learning outcome will constitute 7% of the course's grade.

4. Examine the flow of energy in ecosystems.

Elements of the performance:

discuss the laws of thermodynamics as they relate to ecosystems

describe biotic and abiotic sources of energy

distinguish between and provide examples of food webs, food chains, and ecological pyramids

This learning outcome will constitute 8% of the course's grade.

5. Examine the cycling and role of nutrients.

Elements of the performance:

distinguish between and provide examples of geochemical, biochemical and biogeochemical cycling

briefly describe the major steps in the following nutrient cycles: nitrogen, carbon, phosphorus and hydrological

identify the major nutrients required for plant growth

identify symptoms of deficiency and/or excess of each nutrient

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discuss the relationship of plant nutrients to animal nutrition

demonstrate the effect of various deficiencies through a lab analysis of plants grown in nutrient deficient environments

This learning outcome will constitute 15% of the course's grade.

6. Discuss the role of major abiotic factors in natural ecosystems.

Elements of the performance:

illustrate graphically the law of tolerance and the law of the minimum as they affect range and distribution of organisms

provide examples of positive and negative influences of: temperature, photoperiod, solar radiation, humidity, precipitation, wind, soils and geology, topography

demonstrate how organisms use abiotic information to regulate their activities using temperature and its role in breaking diapause in gall formers

be able to calculate Day-Degree values

This learning outcome will constitute 20% of the course's grade.

7. Discuss various general characteristics of populations.

Elements of the performance:

define populations

differentiate between the following symbiotic relationships: predation, parasitism, mutualism, commensalism and disease and provide examples

differentiate between interspecific and intraspecific competition and provide examples of each

explain the carrying capacity concept

This learning outcome will constitute 10% of the course's grade.

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8. Discuss characteristics of community structure and species interaction.

Elements of the performance:

define a community

provide examples of community stratification in terrestrial and aquatic ecosystems

distinguish between vertical and horizontal stratification and discuss their significance in biodiversification

describe the stages of ecological succession using various examples

distinguish between primary and secondary succession

describe how communities respond to disturbance such as fire, wind, timber harvesting, flooding, disease, erosion

conduct an ecological survey and summarize field data to describe the structure of a forest community including: vertical stratification, community composition, habitat values, successional sere

This learning outcome will constitute 20% of the course's grade.

m. TOPICS TO BE COVERED

Introduction to Ecology

Ecosystem Characteristics

Ecological Energetics

Abiotic Factors Affecting Ecosystems

Biotic Factors Affecting Ecosystems

Community Structure

Stratification and Succession

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IV. REQUIRED STUDENT RESOURCES (OPTIONAL)

1. Zuchlinski,J.A. 1999.Ecology Lab Manual.

V. EVALUATION PROCESS/GRADING SYSTEM:

MAJOR ASSIGNMENTS AND TESTING

Mid-term test - 25%

Final test - 25%

Lab Assignments - 50%

Total **100%**

A total of 9 lab projects will be conducted over the course of the semester. The total value of labs represents 50% of the total mark.

Labs will be evaluated on the basis of neatness, accuracy, and thoroughness.

Lab values will be reduced at a rate of 10% per day for late submissions for a period of 5 days after the due date. After 5 days the lab will be evaluated as a zero. All labs must be submitted regardless of grade to pass the course.

Course Grading Scheme

A+	90% - 100%	outstanding achievement
A	80% - 89%	above average achievement
B	70% - 79%	average achievement
C	60% - 69%	satisfactory achievement
R	repeat	

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X

a temporary grade that is limited to instances where special circumstances have prevented the student from completing objectives by the end of the semester. An "X" grade must have the Dean's approval and has a maximum time limit of 120 days

VI. SPECIAL NOTES:

Special Needs

If you are a student with special needs (e.g. Physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717 or 491 so that support services can be arranged for you.

Plagiarism

Students should refer to the definition of academic dishonesty in the Statement of Students Rights and Responsibilities.

Students who engage in academic dishonesty will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course, as may be decided by the professor.

In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Advanced Standing

Students who have completed an equivalent post-secondary course should bring relevant documents to the Coordinator, Natural Resources Programs.

Retention of Course Outlines

It is the responsibility of the student to retain all course outlines for possible future use in gaining advanced standing at other post-secondary institutions.

Substitute course information is available at the Registrars Office.

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Vn. PRIOR LEARNING ASSESSMENT:

Please contact the Prior Learning Assessment Office (E2203) for further information.