

DOC. # 259

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY  
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

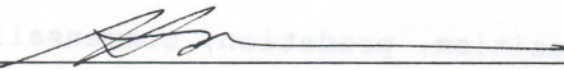
COURSE TITLE: BIOLOGY/ECOLOGY

CODE NO.: BIO 114-3 SEMESTER: III

PROGRAM: FORESTRY TECHNICIAN

AUTHOR: GORD STONE

DATE: MAY 1993 PREVIOUS OUTLINE DATED: JANUARY 1992

APPROVED: DEAN  DATE MAY 25 1993



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TOTAL CREDIT HOURS: 48

PREREQUISITE(S): SC1115

**I. PHILOSOPHY/GOALS:**

This is an elementary course in biology and ecology designed for resource management students. It covers the organization of life and the vital processes of plants, animals, and ecosystems. Emphasis is on structure and function of cells, plant growth and development, microstructure of wood and energy flow through forest ecosystems. Field and laboratory work are stressed.

**II. STUDENT PERFORMANCE OBJECTIVES:**

1. Illustrate and identify from a sketch the major types of plant cells and tissues.
2. Explain the mechanisms of primary plant growth.
3. Explain the mechanisms of and differences between primary and secondary plant growth.
4. Discuss the development and function of important secondary plant cells and tissues.
5. Compare the wood structure of gymnosperms and angiosperms.
6. Distinguish between the sciences of biology and ecology.
7. Differentiate the terms niche and habitat.
8. Illustrate the differences between food chains, food webs and ecological pyramids.
9. Illustrate or discuss the cycling of three major nutrients.
10. Discuss the Law of the Minimum and the Law of Tolerance.
11. Discuss effects of the abiotic environment on the distribution abundance and adaptive characteristics of living things.
12. Illustrate the differences between sigmoid and exponential growth curves, and briefly explain the relationship of each to environmental resistance.
13. Describe the effects of parasitism, predation, commensalism and mutualism and competition.
14. Illustrate the principle edges/ecotones using examples.
15. Illustrate the stratification of forest and aquatic ecosystems, using examples.
16. Discuss the concept of species diversity, and relate species diversity to community stability.
17. Illustrate the succession from rock, soil or water.



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III. TOPICS TO BE COVERED:

1. Ecology - a logical extension of Biology.  
The concepts of niche, habitat and microhabitat.  
Food chains and webs  
Trophic levels and ecological pyramids.
2. Abiotic Influences on populations.  
Law of the Minimum and Law of Tolerance.
3. Biotic Influences on populations.  
Growth curves, environmental resistance, carrying capacity.  
Interspecific interactions.
4. Structure of communities and ecosystems.  
Principle of edges/ecotones, species diversity.  
Stratification of forest and aquatic ecosystems.
5. Succession on bedrock, sand dunes, abandoned fields.  
Aquatic succession leading to marshes and bogs.
6. Cycling of nutrients through ecosystems.  
The cycles of Carbon, Phosphorous and Nitrogen.
7. Specialized plant cells and tissues.  
Parenchyma, collenchyma, sclerenchyma, etc.  
Xylem, phloem, cambium, cork cambium, epidermis, etc.
8. Primary growth of plants.  
Structure of seeds.  
Growth of seeds, shoots and roots.
9. Secondary growth of plants.
10. Structure and function in woody stems.  
Development and function of secondary cells and tissues.  
Microstructure of wood - angiosperms.  
Microstructure of wood - gymnosperms.



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#### IV. LEARNING ACTIVITIES

Ecology Project: field trip, specimen collection and identification with complete written report

Lab #1: Primary growth of woody stems.

Lab #2: Secondary growth of woody stems.

Impromptu talk: on a randomly chosen ecological concept - text definition, own words, demonstrate to class without reading the definition.

Lesson plan for a public school presentation on a given ecological concept.

Teach the prepared lesson to Biology/Ecology class.

Test - design a test with 10 questions, answers to questions, and reason why student chose the particular questions.

#### V. EVALUATION METHODS:

Ecology project	- 20%
Impromptu talk	- 10%
Lesson plan	- 20%
Teach a class	- 20%
Design a test	- 20%
2 labs	- 10%

#### VI. REQUIRED STUDENT RESOURCES:

Biology/Ecology 114 Study Guide.

#### VII. SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.