

SAULT COLLEGE

APPLIED ARTS and TECHNOLOGY

Sault Ste. Marie

COURSE OUTLINE

ENVIRONMENTAL BIOLOGY

BIO 211-3

Revised May 1982

## ENVIRONMENTAL BIOLOGY

BIO 211-3

### EDUCATIONAL GOAL

To increase our knowledge of the environment and some of the biota contained therein.

### SPECIFIC OBJECTIVES

The student will construct an environmental impact matrix and be familiar with several methods of preparing impact statements

The student will identify several mosses, clubmosses, lichens, and ferns by sight and by use of a key as well as being able to list their structural differences, uses, and life cycle.

The student will practice keying of aquatic plants and be able to identify several species by sight. He will be able to explain how aquatic plants relate to and affect water quality, fish habitat, and recreation.

The student will practice keying of aquatic invertebrates and be able to identify several species by sight. He will be able to place the common species to lotic or lentic environments.

The student will be able to list distinguishing features of 20 fresh water fish and identify at least 20 species by sight. He will be able to place these species in an oligotrophic or eutrophic habitat

The student will be able to list structural differences and identify by sight up to 20 game waterfowl. He will be able to list typical habitat for these species and flyways used as well as identify major waterfowl foods.

The student will be able to identify several common Ontario bird species and be familiar with their role in the ecosystem.

The student will be able to identify several common Ontario mammals and be familiar with their role in the ecosystem.

The student will identify tracks and signs of common Ontario mammals and birds.

During a field trip the student will apply taxonomic abilities learned throughout the course and submit a written report and a specimen collection

A plant collection will be made during the summer between second and third semester (see attached page "Forest Plant Collection")

SPECIFIC OBJECTIVES

The student will be knowledgeable enough to prepare and deliver a five minute talk on some aspect of mans influence on Bio energetics

Using library books for reference the student will establish relationships between at least two Ontario mammals and the autotrophs and heterotrophs previously studied.

ENVIRONMENTAL BIOLOGY

BIO 211-3

TEXTBOOK:

Lab Manual.

Andrews, W.A. 1980. Biological Science. Scarborough, Ont.  
Prentice-Hall.

Needham & Needham, 1962. Fresh Water Biology. San Francisco.

Leopold, Luna B. 1971. A Procedure for Evaluating Environmental  
Impact. Washington Geological Survey Circular 645.

References:

Pennak, R.W. 1953. Freshwater Invertebrates of the U.S. New York  
Ronald Press.

Crum, H. 1973. Mosses of the Great Lakes Forest. University of Michigan.

Hotchkiss, N. 1970. Common Marsh Underwater & Floating-Leaved Plants.  
Dover Publications, New York.

Thomasson, R.D. Wildlife Land Capability Rating Method. Ministry of  
Natural Resources, Ontario.

Martin, A.C. and Herbert, S.Z. and Arnold, L.W. 1961. A Guide to  
Wildlife Food Habits. General Publishing, Toronto.

Scott, W.B. and Crossman, E.J. 1973. Freshwater Fishes of Canada.  
Bulletin 184, Fisheries Research Board of Canada, Ottawa.

Roger Tory Peterson, 1947. Field Guide to the Birds. Houghton Mifflin,  
Boston.

Burt, W.J. and Grossenheoder, R.P.<sup>76</sup> Field Guide to the Mammals.  
Houghton Mifflin, Boston.

Cobb, B. 1956. Field Guide to the Ferns. Houghton Mifflin, Boston.

Murie, O. 1954. Field Guide to the Animal Tracks. Houghton Mifflin,  
Boston.

ENVIRONMENTAL BIOLOGY

BIO 211-3

Topic No.	Periods	Topic Description
1	3	<u>Impact Matrix</u> Explanation and discussion of requirements for impact statement. Examples of statements, Environment and the law.
2	3	<u>Matrix</u> Discussion of the validity of student matrix <u>Clubmosses and lichens</u> Identification of 6 species structure, function, life cycle.
3	3	<u>Mosses</u> Identification of 9 species structure, function, life cycle, habitat.
4	3	<u>Ferns</u> Identification and life cycle habitat and relation
5	5	<u>Aquatic Plants</u> Identification structure and uses. Habitat and relations. Water quality.
6	4	<u>Aquatic Invertebrates</u> Identification by sight and key, habitat. Relationship with man.
7	4	<u>Fish</u> Keying for identification of species, habitat, structure, uses.
8	3	<u>Waterfowl</u> Identification and habitat of game waterfowl, foods.
9	4	<u>Birds</u> Identification and habitat of common bird species.
10	4	<u>Mammals</u> Identification and habitat of common Ontario mammals.
11	3	<u>Tracks and Signs</u> Identification of tracks and signs. Making a cast.

Topic No.	Periods	Topic Description
12	3	<u>Field Trip</u> Examine given area for: inventory of biota ecological relationships possible uses.
13	5	<u>Mans Influence on Bio-energenics</u> Student will deliver 5 minute talk.
14	2	<u>Ecological Relationships</u> Relating of Ontario mammals to previously studied autotrophs and heterotrophs.

ENVIRONMENTAL BIOLOGY

BIO 211-3

Evaluation

- Test No. 1 Lichen, Clubmoss, Moss, Fern, 20%
- Test No. 2 Aquatic Plants, Aquatic Invertebrates, 20%
- Test No. 3 Ducks, Fish, 20%
- Test No. 4 Birds, Mammals, 20%
- Field trip report, 7%
- Plant collection, 8%
- Talk, 5%
- Impact matrix: satisfactory or not satisfactory.
- Ecological relationships bonus

Grade

- A 90%
- B 80%
- C 60%

Rewrite C will be worth less than a regular C.

If only one unit is failed there will be a rewrite for that unit. If more than one unit is failed there will be a rewrite for the whole course.

## FOREST PLANT COLLECTION

Due date: end of first week of classes

Number to be collected: minimum of 10

- 5 species must include both flowers and fruit to receive higher than a C grade for the collection
- specimens must be from at least 3 different forest communities (see forest communities list in lab manual)
- species must be native
- include all of plant where possible if too large a specimen indicate amount not included
- collection must include an index of common and scientific names
- specimens should be mounted in a large scrapbook
- all collecting must be legal

Description for each plant: plant name  
locality  
date  
stand type  
soil type  
soil moisture

List of unacceptable specimens: lichens  
mosses  
ferns  
grasses  
sedges  
rushes  
strawberries  
raspberries  
buttercups  
dandelions  
shrubs