

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

COURSE OUTLINE

COURSE TITLE: AQUATIC BIOLOGY

CODE NO.: BIO 125-4 SEMESTER: I

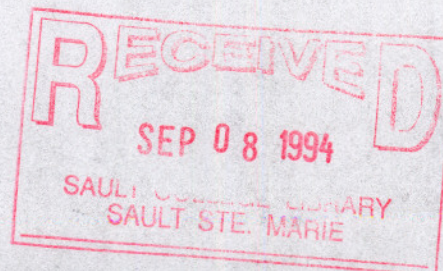
PROGRAM: WATER RESOURCES/ENVIRONMENTAL ENGINEERING/PULP & PAPER

AUTHOR: H. ROBBINS

DATE: AUGUST 1994 PREVIOUS OUTLINE DATED: MAY 1993

APPROVED: *H. Robbins*
DEAN

Aug 20/94
DATE



AQUATIC BIOLOGY

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I. PHILOSOPHY/GOALS:

This course will introduce the student to the diversity of micro and macroscopic life around and in the aquatic environment. Students will learn to identify major species of microorganisms, plants and animals that are indicators of water quality (that are in) or important to aquatic habitats. Biological and microbiological procedures for examining organisms, their structures and adaptations will be emphasized in laboratory sessions.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

1. Describe the 9 major characteristics of living things.
2. Discuss classification methods and procedure.
3. Distinguish between procaryotic and eucaryotic cell types and their structures.
4. Demonstrate proper microtechnique and knowledge of macro- and micro-biological procedures.
5. Discuss characteristics of viruses, blue-green and bacteria common in aquatic habitats.
6. Compare life cycles and importance of single-celled algae and protozoa.
7. Identify the characteristics and importance of green algae.
8. Discuss importance and identifying features of aquatic plants and riparian vegetation.
9. Discuss the importance of fungi.
10. Describe the sequence of development from lower to higher animal life.
11. Describe and identify various important crustacea and insecta.
12. Discuss the features of the aquatic chordates.

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III. TOPICS TO BE COVERED:

1. Fundamentals of Biology and Classification of Organisms
2. Higher Plants in Terrestrial Habitats (Riparian Vegetation)
3. Use of the Microscope, Cell Structure and Function
4. Viruses and Primitive Life Forms
5. Kingdom Protista - Single-Celled Organisms
6. Kingdom Plantae - Green Algae and Chara
7. Kingdom Plantae - Higher Plants in Aquatic Habitats (Aquatic Plants) and Kingdom Fungi*
8. Kingdom Animalia - Sponges, Flatworms and Roundworms*
9. Kingdom Animalia - Fish Parasites, Molluscs and Segmented Worms*
10. Higher Invertebrates - Arthropods - Crustaceans
11. Field Trip - Collection of Aquatic Vertebrates
12. Higher Invertebrates - Arthropods - Insect Anatomy and Classification
13. Higher Invertebrates - Arthropods - Identification of Aquatic Insects
14. Aquatic Chordates - Fish Classes and Anatomy
15. Aquatic Chordates - Fish Identification

* These three topics will be replaced by topics on tree growth and structure for the Pulp and Paper students.

Alternate Topics to be Covered by Pulp and Paper Students

7. Wood Structure (Hardwoods)
8. Wood Structure (Softwoods)
9. Wood Identification

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IV. EVALUATION METHODS:

Laboratory assignments/Field collections	30%
Term tests based on theory material	50%
Laboratory identification tests	20%
	<u>100%</u>

Grading:	A+= 85% and over consistently
	A = 75% - 84%
	B = 68% - 75%
	C = 60% - 67%

A passing grade will be based on a composite grade of 60%. For students that attain less than 60%, but over 55% overall, ONE rewrite exam may be allowed providing that attendance and demonstrated effort are satisfactory. Not all lab reports will be marked in their entirety.

Attendance is required to each lab, and all sketches or lab reports must be submitted. Any session that is missed will be made up on the student's own time. Most lab reports are to be submitted at the end of the lab session.

V. REQUIRED RESOURCES:

Aquatic Biology Study Guide - 1994

Lab Manual

Lab manual for Aquatic Biology (BIO125) - 1994

Other Materials

Dissecting Kit
Laboratory Coat (suggested)
Plain unlined paper
Variety of pencils, eraser, pens, 2H pencil
Photo album for leaf collection

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VI. ADDITIONAL RESOURCE MATERIAL:

There will be no assigned text for the course because of the diversity of topics covered. However, the following books will be useful for students to consult for review:

1. Anon, N.D., Manual of Ontario Aquatic Plants, draft copy, Ontario Ministry of Natural Resources, Toronto, 80 p.
2. Any Basic college-level Biology text.
3. Eddy, S. and J.C. Underhill. 1969. How to Know the Freshwater Fishes. W.C. Brown, Dubuque. 215 pages.
4. Hosie, R.C., 1973, Native Trees of Canada, Can. Dept. of Environment, Ottawa, 380 p.
5. Lehmkuhl, D.M. 1979. How to Know the Aquatic Insects. W.C. Brown, Dubuque. 168 pages.
6. Needham, J.G., and P.R. Needham, 1962, A Guide to the Study of Freshwater Biology, Holden-Day Inc., San Francisco, 108 p.
- Prescott, G.W. 1978. How to Know the Freshwater Algae. 3rd ed. W.C. Brown. Dubuque. 293 pages.
8. Prescott, G.W. 1980. How to Know the Aquatic Plants. W.C. Brown, Dubuque. 158 pages.

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.