

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

COURSE OUTLINE

Course Title: ENVIRONMENTAL MEASUREMENTS
Code No.: FOR 307-4
Program: FISH AND WILDLIFE TECHNOLOGY
Semester: SIXTH
Date: NOVEMBER, 1985
Author: VALERIE WALKER

New: _____ Revision: X

APPROVED:


Chairperson

Nov 26/85
Date

CALENDAR DESCRIPTION

ENVIRONMENTAL MEASUREMENTS

FOR 307-4

COURSE NAME

COURSE NUMBER

PHILOSOPHY/GOALS: This is a course providing the measurement and analysis of various parameters within the environment as well as a discussion of their significance.

Examination is made of primary production, oxygen consumption in aquatic systems, responses of test organisms to a particular pollutant (bioassay), fish health as reflection of the environment, aging structures and age determination of fish, physical and chemical properties of soils.

METHOD OF ASSESSMENT (GRADING METHOD):

Lab Reports	- 70%
Term Tests (3)	- 30%
	<u>100%</u>

ATTENDANCE: Lab attendance is **compulsory**. Students missing labs without documented reason run the risk of repeating the course.

TEXTBOOK(S): No textbook required for purchase. Lab manual is available at Campus Bookstore. Several reference books are on reserve at the Learning Resources Centre.

FOR 307-4 COURSE OUTLINE...3

LECTURE/LAB FORMAT

WEEK

1

Introduction

- evaluation
- course outline
- lab safety
- lab equipment

Unit I: Primary Production

- primary production limitation by light
- primary production limitation by nutrients
- factors affecting productivity

2

Lab 1: Primary Production in Standing Water

3

Unit II: Oxygen Consumption in Aquatic Animals

- factors affecting oxygen consumption

Lab 2: Temperature & Oxygen Consumption in Aquatic Animals

4

Unit III: Toxic Pollutants

- types of toxic pollutants
- toxicity
- environmental factors affecting toxicity
- transformations
- tolerance
- accumulation
- (Video)

5

Lab 3 - Bioassay

5

TERM TEST #1

6, 7

Unit IV: Fish Health and The Environment

- neoplastic diseases of fish
- diseases caused by toxic substances and organic wastes
- (Video)
- (Speaker)

ENVIRONMENTAL MEASUREMENTS REFERENCES

*ON RESERVE IN LIBRARY

Alabaster, J.S. and R. Lloyd. 1982. Water Criteria for Freshwater Fish (2nd Edition). Butterworth's, Inc., Yarmouth, MA.

*American Public Health Association, American Water Works Association, and Water Pollution Control Federation. 1975. Standard Methods for the Examination of Water and Wastewater. 14th edition. American Public Health Association, Washington, D.C.

*American Society for Testing and Materials, 1977. Bacterial Indicators -- Health Hazards Associated with Water. Phil.

*American Society for Testing and Material. 1977. Aquatic Toxicology and Hazard Evaluation. Philadelphia.

*Andrews, W.A. 1972. A Guide to the Study of Environmental Pollution. Prentice-Hall, Inc., Scarborough, Ont.

Black, John A. 1977. Water Pollution Technology. Reston Publishing Company, Inc. Virginia.

*Cairns, John Jr. 1982. Biological Monitoring in Water Pollution. Pergamon.

Chant, D.A. 1970. Pollution Probe. New Press, Toronto.

Edmondson, W.T. (1969) Eutrophication in North America. In - Eutrophication: Causes, Consequences, Correctives. pp. 124-49, National Academy of Sciences, Washington.

Environmental Protection Agency. 198-. Water Quality Criteria. EPA R3-73-033. Washington, D.C.

*Environmental Studies Board. 1983. Acid Deposition: Atmospheric Processes in Eastern North America. National Academy Press.
Goldman, Charles R. and A. J. Horne, 1983. Limnology. McGraw-Hill, Toronto.

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*Gordon, Malcolm S. 1982. Animal Physiology; Principles and Adaptations (4th edition). MacMillan Publishing Co., Inc. New York.

Hoar, W.S. 1983. General and Comparative Physiology (3rd Edition). Prentice-Hall, Inc., New Jersey.

Hoar, W.S., D. J. Randall and J.R. Brett. 1979. Fish Physiology. Academic Press, Inc. London.

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*Krenkel, P.A. and Parker, F. L. 1973. National Symposium on Thermal Pollution Proceedings: Biological Aspects of Thermal Pollution.

*Larkin, P.A. 1974. Freshwater Pollution Canadian Style. McGill-Queen's University Press, Montreal.

*Laws, Edward A. 1981. Aquatic Pollution: An Introductory Text. John Wiley and Sons, Toronto.

Mason, C.F. 1981. Biology of Freshwater Pollution. Longman.

*McNeely, R.N., V.P. Neimanis and L. Dwyer. 1979. Water Quality Sourcebook Guide to Water Quality Parameters. Environment Canada, Inland Waters Directorate, Water Quality Branch, Ottawa.

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*Reid, George K. 1961. Ecology of Inland Waters and Estuaries. Van Nostrand Reinhold Co.

Ruttner, F. 1963. Fundamentals of Limnology. University of Toronto Press, Toronto.

*Smith, R.L., 1974, Ecology and Field Biology. Harper and Row Publishers, New York.

*Sprague, J. B. 1973. The ABC's of Pollution Bioassay Using Fish. Biological Methods for the Assessment of Water Quality, ASTM STP 528, American Society for Testing and Materials, 1973, pp. 6-30. (Reprint available)

Tinsley, Ian J. 1979. Chemical Concepts in Pollution Behaviour. Wiley Interscience.

Tourbier, J. and R. W. Pierson, Jr., Editors. 1976. Biological Control of Water Pollution. University of Pennsylvania Press, Inc. PA.

Vallentyne, J. R. 1974. The Algae Bowl. Lakes and Man. Canada Department of the Environment - Fish and Marine Service, Misc. Spec. Pub. No. 22: 186 pp.

Wagner, R. H. 1971. Environment and Man. Norton, New York.

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Warren, C.E. 1971. Biology and Water Pollution Control. Saunders, Philadelphia.

Wetzel, Robert G. 1983. Limnology (2nd edition). Saunders, College Publishing, Toronto.

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*Wilber, Charles G. 1969. The Biological Aspects of Water Pollution. Charles C. Thomas. Illinois.

*Whorf, D.L. 1980. Biological Monitoring for Environmental Effects. Lexington Books.