

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



COURSE OUTLINE

Course Title: AQUATIC SURVEYS

Code No.: FOR246-4 Semester: 3

Program: FISH & WILDLIFE TECHNICIAN - 5206

Author: VALERIE WALKER

Date: SEPT. 1997 Previous Outline Date: SEPT. 96

Approved:  October 2, 1997
Dean, Natural Resources Date

Total Credits: 4 Prerequisite(s):

Length of Course: 3 hrs/wk X 16 wks

Total Credit Hours: 48

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(705) 759-2554, Ext. 687.

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I. COURSE DESCRIPTION:

This is a field course designed to provide students with practical, hands-on experience to evaluate the physical, chemical and biological parameters of lake and stream ecosystems. Students will produce a depth contour map, a lake physical features map and a stream gradient profile based on field data.

Gill nets, trap nets and electroshockers will be utilized to assess fish species present. Proper handling and processing of fish will be practiced, as well as the removal and preparation of structures for age determination.

The purpose, procedure and data analysis for a creel census will be considered and a creel will be conducted at the St. Mary's Rapids during the salmon run.

A freshwater invertebrate collection of 25 identified specimens is required for submission.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

A. Learning Outcomes:

1. Use appropriate field equipment and proper field technique, to assess physical, chemical and biological parameters of both lake and stream ecosystems.
2. Document, analyze and interpret field data and present in appropriate standardized forms or as figures or maps
3. Document, process and correctly identify 25 freshwater invertebrates for presentation
4. Discuss, design and conduct various fisheries surveys and document, analyze resulting data

B. Learning Outcomes and Elements of the Performance:

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

1. Use appropriate field equipment and proper field technique, to assess physical, chemical and biological parameters of both lake and stream ecosystems.

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Potential elements of performance

- correctly operate and where necessary, calibrate the following instruments and equipment used in aquatic surveys: oxygen meter, conductivity meter, pH meter, HACH kit, secchi disc, Juday plankton net, Kemmerer bottle, Wisconsin plankton net, sample tube, echo sounder (Lowrance X-1550), current meter, surber sampler
- demonstrate in the field the effective use of passive and active fish capture techniques such as gill nets, trap nets, minnow traps, seines and electrofisher
- discuss the effect on fish physiology, the mechanics and safety concerns when operating an electroshocker
- process fish by determining and recording total length; fork length; weight; sex; stomach contents; state of health; presence of parasites, tags or marks and by removing scales, fin rays cleithrum and/or otoliths for age determination
- select and use appropriate field equipment to collect and preserve forage fish and aquatic invertebrates

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

2. Document, analyze and interpret field data and present in appropriate standardized forms or as figures or maps

Potential elements of performance

- construct a lake physical features map, lake contour map and stream gradient profile for the areas of study using appropriate technical pens, standardized symbols and single stroke commercial Gothic lettering
- complete all summary forms, field collection records and scale sample envelopes for the area of study
- calculate stream velocity and discharge using current meter field data
- calculate volume, mean depth and shoreline development factor (S.D.F.) for the study lake
- demonstrate the preparation of various fish anatomical structures for age determination

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- perform back-calculations on fish aging data (cont'd from Page 3)

This learning outcome will constitute 50% of the course's grade

3. Document, process and correctly identify 25 freshwater invertebrates for presentation

Potential elements of performance

- use appropriate procedure to preserve and document aquatic invertebrates
- use effectively a binocular microscope and reference keys to correctly identify 25 aquatic invertebrates to at least Family
- submit an invertebrate collection as outlined with specimen collection records, index and references used

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

4. Discuss, design and conduct various fisheries surveys and document, analyze resulting data

Potential elements of performance

- explain the objectives of conducting a creel/survey and describe the two design types and the calculation differences for each in determining C.U.E. and harvest
- conduct creel survey interviews with anglers and record information correctly on interview forms and/or hand-held computers
- describe various fish tagging and marking techniques and their limitations
- discuss the methods of estimating fish populations and describe the signs of over exploitation
- describe the life cycles and importance of common fish parasites of Ontario
- explain the various index netting programs used to assess fish populations

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

Note: These topics sometimes overlap several areas of skill development and are not necessarily intended to be explored in isolated units or in the order below.

1. Lake Survey
2. Stream Survey
3. Creel Census - objectives and design
4. Fish Tagging, Marking and Capture
5. Fish Parasites
6. Fish Population Estimates and Aging Techniques

IV. REQUIRED RESOURCES/TEXTS/MATERIALS

1. Dodge, D.P. et al. 1986. Manual of Instructions - Aquatic Habitat Inventory Surveys. Fisheries Branch, Ontario Ministry of Natural Resources
2. Sault College. 1996. Aquatic Surveys (For 246) Lab Outline

Other Required Student Resources:

- | | |
|---------------------------------|-----------------------------------|
| * dissection kit | * field notebook |
| * technical pens #00, #1 and #2 | * vellum graph paper(letter size) |
| * vellum paper 17"X22" | |

Additional Resource Material Available in the College Library:

Lehmkuhl, D.M., 1979. How to Know the Aquatic Insects. Wm. C. Brown Co. Publishing, Dubuque.

McClane, A.J., 1978. Field Guide to Freshwater Fishes of North America. Holt, Rinehart and Winston, New York.

Pennack,R.W., 1978. Freshwater Invertebrates of the United States, 2nd edition, John Wiley and Sons, Toronto.

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