

**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

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Date: SEPT 98 Previous Outline Date: SEPT 97

Approved: _____ Sept 11, 1998
Dean, Natural Resources Date
Programs

Total Credits: 4 Prerequisite(s):
Length of Course: 3 hrs/week Total Credit Hours: 48

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For additional information, please contact Joe Fruchter, Dean, Natural Resources Programs,
(705) 759-2554, Ext. 688.

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, figures or maps
3. Document, process and correctly identify 25 freshwater invertebrates for presentation
4. Conduct various surveys to assess relative abundance of a target species and estimate sports fishing pressure.

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.

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, HYDROLAB, 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 small littoral 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, 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

Potential elements of performance (con't):

- 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
- perform back-calculations on fish aging data

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 included

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

4. Conduct various surveys to assess relative abundance of a target species and estimate sports fishing pressure.

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

Potential elements of performance (con't):

- discuss the various methods of estimating fish populations and describe the signs of over exploitation
- describe the standard index netting surveys (SLIN, FWIN, NSCIN) used to assess the relative abundance of fish species

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

III. TOPICS

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 Population Estimates and Signs of Over Exploitation

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. 1998. Aquatic Surveys (For 246) Lab Outline

Other Required Student Resources:

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

Additional Resource Material Available in the College Library:

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

Merritt R.W. and K.W. Cummins. 1996. An Introduction to the Aquatic Insects of North America. 3rd edition. Kendall-Hunt Publishing Company. Dubuque, Iowa.

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.

V. EVALUATION PROCESS / GRADING SYSTEM

MAJOR ASSIGNMENTS AND TESTING

Unit tests (3)	25%
Assignments/quizzes	75%

Marks are cumulative, however due to the large field component of the course and the fact that much of the assignments are based on data collected in the field, students receiving a final grade of less than 60% will **NOT** have the opportunity to rewrite.

- NOTE:**
1. Attendance during field trips is **MANDATORY**. Students missing field trips without a valid, documented reason will risk repeating the course.
 2. **ALL** submissions must be made for a passing grade

SUMMARY OF STUDENT EVALUATION

Aquatic Collection	15
Lake Contour Map, Transect Map and Data Collection Sheet	15
Physical Features Map	10
Remaining Lake Survey Forms	10
Gradient Profile	10
Tests/Quizzes/Creel	40

	100

Late Assignments:

Ten percent (%) will be deducted from the total value of the assignment for every day late.

Late Equipment:

Ten percent (%) may be deducted for chronic lateness in returning signed out equipment

Course Grading Scheme

- A+ 90% - 100% outstanding achievement
- A 80% - 89% above average achievement
- B 70% - 79% average achievement
- C 60% - 69% satisfactory achievement
- R repeat
- X a temporary grade that is limited to instances where special circumstances have prevented the student from completing objectives by the end of the semester. An "X" grade must have the Dean's approval and has a maximum time limit of 120 days

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VI. SPECIAL NOTES:

Special Needs:

If you are a student with special needs (e.g. Physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717 or 491 so that support services can be arranged for you.

Plagiarism

Students should refer to the definition of “academic dishonesty” in the “Statement of Students Rights and Responsibilities”.

Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course, as may be decided by the professor.

In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Advanced Standing

Students who have completed an equivalent post-secondary course should bring relevant documents to the Coordinator, Natural Resources Programs.

Retention of Course Outlines

It is the responsibility of the student to retain all course outlines for possible future use in gaining advanced standing at other post-secondary institutions.

Substitute course information is available at the Registrar’s Office or the Department of Natural Resources’ Office.

VII. PRIOR LEARNING ASSESSMENT:

Please contact the Prior Learning Assessment Office (E2203) for further information.