

I. COURSE DESCRIPTION:

This is a field course designed to provide students with practical, hands-on instruction to assess the physical, chemical and biological parameters of lake and stream ecosystems. Surveys conducted will follow provincial protocols such as the Ontario Benthos Biomonitoring Network (OBBN) and the Ontario Stream Assessment Protocol (OSAP) to assess ecosystem condition. In addition, students will conduct a creel survey to determine fishing pressure on the St. Mary's River during the salmon run. Various Ontario index netting programs will be discussed as methods of providing an unbiased index of abundance as well as collecting biological information on important fish species.

A freshwater invertebrate collection of 20 identified specimens is required for submission.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Prepare a field map of a lake to be surveyedPotential Elements of the Performance:

- using appropriate maps, determine the location data for the study lake including local name, topographical map name, district, township, lot & concession, elevation, GPS coordinates, watershed code and access
- accurately determine lake perimeter, surface area and percentage of crown vs patent land
- create a 1:10 000 scale lake basin outline on mylar including inlets, outlets, trails, roads, power lines, buildings, access point(s), area conversion factor (A.C.F) and north arrow to be used in the field

This learning outcome will constitute approximately 5% of the course's grade

2. **Conduct a stream survey using standard equipment and methodology**

Potential Elements of the Performance:

- demonstrate in the field the effective and safe use of a backpack electro-fishing unit in sampling fish communities in streams as outlined in the Ontario Stream Assessment Protocol (OSAP)
- discuss the effect on fish physiology, the mechanics and safety considerations when operating an electro-fisher
- properly process and document fish samples
- correctly conduct point-transect sampling for channel structure, substrate and bank conditions using the Ontario Stream Assessment Protocol (OSAP) under test conditions
- conduct an Ontario Benthos Biomonitoring Network (OBBN) survey including sampling processing and identification of invertebrates to the minimum required taxonomic detail
- demonstrate the effective use of the Travelling-Kick-and-Sweep-Transect-Method as a sampling method to collect aquatic invertebrates

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

3. **Document, display, analyze and interpret survey field data including lake bathymetry**

Potential Elements of the Performance:

- construct a lake physical features map based on shore cruise data using Arc/Info
- construct a lake contour map based on lake bathymetry data using Arc/Info
- calculate volume, mean depth and shoreline development factor (S.D.F.) for the study lake
- determine habitat suitability indices for specific indicator species based on field data
- correctly complete Ontario Benthos Biomonitoring Network (OBBN) and Ontario Stream Assessment Protocol (OSAP) standardized field forms
- compile all lake survey field data including fish vital statistics, water chemistry and shore cruise data into a comprehensive technical report including summary statistics

This learning outcome will constitute 40% of the course's grade

4. **Conduct a creel survey and estimate sports fishing pressure and harvest rates by species.**

Potential Elements of the Performance:

- explain the objectives of conducting a creel/survey and describe the two design types and the calculation differences for each in determining C.P.U.E. and harvest
- properly interview anglers, process fish, complete field records and input data as part of a creel survey

This learning outcome will constitute 10% of the course's grade

5. **Document, process and correctly identify 20 freshwater invertebrates for presentation.**

Potential Elements of the Performance:

- properly collect, preserve and document aquatic invertebrates
- use effectively a binocular microscope and reference keys to correctly identify 20 aquatic invertebrates to Family
- submit an invertebrate collection as outlined with specimen collection records, index and references included

This learning outcome will constitute 10% of the course's grade

6. **Describe various methods used in Ontario to assess the status of a fish population.**

Potential Elements of the Performance:

- describe common fish tagging and marking techniques and their limitations in estimating species abundance
- discuss the indicators of over exploitation
- describe Ontario's provincial index netting standards (Spring Littoral Index Netting, Brook Trout Index Netting, Fall Walleye Index Netting and Nearshore Community Index Netting) to assess relative abundance

This learning outcome will constitute approximately 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 Pre-field Work
2. Stream Survey
3. Creel Census - objectives and design
4. Fish Tagging, Marking and Capture
5. Index Netting

IV. REQUIRED RESOURCES/ TEXTS/ MATERIALS:

Bouchard, R.W., Jr. 2004. Guide to Aquatic Invertebrates of the Upper Midwest **on line**:

<http://wrc.umn.edu/outreach/vsmp/edmaterials/index.html>

Volunteer Stream Monitoring Interactive Verification Program (VSM-IVP) **on line**:

<http://www.entomology.umn.edu/midge/VSMIVP.htm>

Jones, C., K.M. Somers, B. Craig, and T.B. Reynoldson. 2007. Ontario Benthos Biomonitoring Network: Protocol Manual. OMOE, Environmental Monitoring & Reporting Branch. Dorset, Ontario (**ON LINE**)

Stanfield, L. (Editor) 2005. Ontario Stream Assessment Protocol. Version 7, Fish and Wildlife Branch. Ontario Ministry of Natural Resources. Peterborough, Ontario. 256 pages. (**ON LINE**)

Voshell, J. Reese. 2002. Guide to Common Freshwater Invertebrates of North America. McDonald and Woodward Publishing Company. Blacksburg, Virginia

Walker, V. 2007. Aquatic Surveys Lab Manual. Sault College, Sault Ste. Marie. (**ON LINE**)

Chest Waders
 Mylar sheets
 20 Vials

V. EVALUATION PROCESS/GRADING SYSTEM:

MAJOR ASSIGNMENTS AND TESTING

Tests	40%
Assignments	60%

NOTE:

- Attendance during field trips is **MANDATORY**. Students missing field trips without a valid, documented reason will risk repeating the course.
- ALL** submissions must be made for a passing grade
- Second Year Field Camp (NRT 251) provides an opportunity for data collection fundamental to mapping exercises and analysis in Aquatic Surveys (NRT 246). Failure to receive a satisfactory (S) grade in F&W Field Camp may seriously hamper success in Aquatic Surveys.

SUMMARY OF STUDENT EVALUATION

Aquatic Collection	10
Lake Survey Report	15
Lake Contour / Physical Features Maps	10
In Field Stream Assessment	15
Creel Survey	10
Tests (Lab/Theory)	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 from the total value of the assignment for chronic lateness in returning signed out equipment from the Tech Office

The following semester grades will be assigned to students:

Grade	Definition	<i>Grade Point Equivalent</i>
A+	90 – 100%	
A	80 – 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

VI. SPECIAL NOTES:

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

AQUATIC SURVEYS
COURSE NAME

NRT 246
CODE NO.

Prior Learning Assessment:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.

Substitute course information is available in the Registrar's office.

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of "academic dishonesty" in *Student Code of Conduct*. A professor/instructor may assign a sanction as defined below, or make recommendations to the Academic Chair for disposition of the matter. The professor/instructor may (i) issue a verbal reprimand, (ii) make an assignment of a lower grade with explanation, (iii) require additional academic assignments and issue a lower grade upon completion to the maximum grade "C", (iv) make an automatic assignment of a failing grade, (v) recommend to the Chair dismissal from the course with the assignment of a failing grade. 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.

Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations, in addition to announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more. Go to <https://my.saultcollege.ca>.

Electronic Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

Tuition Default:

Students who have defaulted on the payment of tuition (tuition has not been paid in full, payments were not deferred or payment plan not honoured) as of the first week of November will be removed from placement and clinical activities. This may result in loss of mandatory hours or incomplete course work. Sault College will not be responsible for incomplete hours or outcomes that are not achieved or any other academic requirement not met as of the result of tuition default. Students are encouraged to communicate with Financial Services with regard to the status of their tuition prior to this deadline to ensure that their financial status does not interfere with academic progress.