SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: **AQUATIC SURVEYS**

CODE NO. : **NRT 246** **SEMESTER:** **3**

PROGRAM: **FISH & WILDLIFE TECHNICIAN**

AUTHOR: **VALERIE WALKER**

DATE: **AUG 2008** **PREVIOUS OUTLINE DATED:** **AUG 2007**

APPROVED: **"B. Punch"**

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CHAIR **DATE**

TOTAL CREDITS: **3**

PREREQUISITE(S): **NONE**

HOURS/WEEK: **3**

AQUATIC SURVEYS NRT 246
COURSE NAME **CODE NO.**

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 surveyed**

Potential 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.

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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)
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:

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

3. 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**	*Grade Point Equivalent*
A+	90 – 100%	4.00
A	80 – 89%	
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:

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

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.

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*. 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/program, as may be decided by the professor/dean. 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.

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

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 <*choose November, March, or June*> 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.

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