

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: LAB RESEARCH TECHNIQUES
CODE NO. : NRT 321 **SEMESTER:** 6
PROGRAM: INTEGRATED RESOURCE MANAGEMENT
TECHNOLOGY
AUTHOR: VALERIE WALKER
DATE: JAN 2008 **PREVIOUS OUTLINE DATED:** JAN 2007

APPROVED:

	_____	_____
	CHAIR	DATE
TOTAL CREDITS:	3	
PREREQUISITE(S):	none	
HOURS/WEEK:	3	

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For additional information, please contact Brian Punch, Chair
The School of the Natural Environment, Technology & Skilled Trade
(705) 759-2554, Ext. 2681

COURSE DESCRIPTION:**I.**

This course will consist of a series of modules that are designed to give the student exposure to state-of-the-art equipment and lab techniques in investigating complex environmental issues. Partners from outside the College are expected to participate in the design and implementation of specialized lab techniques. Data collection, analysis, and report writing will be emphasized.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. **Analyse lake trout stomachs to ascertain the ecology of the deep waters of Lake Superior.**

Potential Elements of the Performance:

- make appropriate notes on the ecology of lake trout in Lake Superior as presented to you
- using the specimens provided, identify, enumerate and weigh the prey found in lake trout and whitefish stomachs from Lake Superior
- using a selected set of data, analyze the results of a portion of this study
- prepare a technical report on the ecology of the deep waters of Lake Superior and include the pertinent ecological relationships

This learning outcome will constitute approximately 10% of the course.

2. **Use a bomb calorimeter and traditional soil chemistry analyses to estimate energy and nutrient levels in browse selected by herbivores.**

Potential Elements of the Performance:

- analyse the caloric value of wildlife browse species from different sites using a bomb calorimeter
- prepare browse sample pellets for combustion
- determine soil pH using a pH meter
- determine soil phosphorus content using an atomic absorption procedure
- prepare calibration curves for parameters to be analyzed
- relate the caloric value of the browse species with the chemical analysis of the soil
- calibrate and standardize instruments required
- prepare a technical report on the findings

This learning outcome will constitute approximately 25% of the course

3. **Use instrumentation for the analysis of various surface water/ waste water parameters.**

Potential Elements of the Performance:

- prepare samples of a given range of concentrations for testing purposes
- perform the standard membrane filter procedure for direct count of coliform colonies in water samples.
- determine suspended and volatile suspended solids using appropriate methods.
- determine the colour in Hazen Units of given water samples using colour comparators.
- calibrate a turbidimeter.
- determine the turbidity of given water samples through use of turbidimeter.
- calculate the biochemical oxygen demand based on the observed *DO* data and percentage dilutions made.
- calculate the amount of chemicals required to make solutions.
- to prepare stock chemical solutions.
- perform jar testing.

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- calibrate an ocular micrometer.
- perform experimental procedures in the measurement of microorganisms.
- prepare a technical report of the findings along with their significance

This learning outcome will constitute approximately 75% of the course.

III. TOPICS:

1. Lake trout stomach analysis
2. Bomb Calorimetry
3. Surface & Waste Water Analysis

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Lab Outlines will be available on LMS

V. EVALUATION PROCESS/GRADING SYSTEM:

Lab Reports/Assignments	90%
Participation	<u>10%</u>
Total	100%

All assignments and the presentation **must** be completed for course credit. Grades for late assignments will be reduced 10% per day late.

Students missing a laboratory/field trip without a provable documented valid reason will be assigned a group for report writing purposes and will receive only 50% of the grade the other group members receive.

The following semester grades will be assigned to students in postsecondary courses:

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Grade	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
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.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.