

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



COURSE OUTLINE

COURSE TITLE: ENVIRONMENTAL MONITORING & ASSESSMENT

CODE NO. : NET 255 **SEMESTER:** W11

PROGRAM: FISH & WILDLIFE TECH
NATURAL ENVIRONMENT TECH

AUTHOR: T. WINTER

DATE: JAN 2011 **PREVIOUS OUTLINE DATED:** N/A

APPROVED: "B.Punch"

CHAIR

DATE

TOTAL CREDITS: 4

PREREQUISITE(S): NIL

HOURS/WEEK: 4

Copyright ©2011 The Sault College of Applied Arts & Technology
Reproduction of this document by any means, in whole or in part, without prior written permission of Sault College of Applied Arts & Technology is prohibited.
For additional information, please contact Brian Punch, Chair,
School of Natural Environment/Outdoor Studies & Technology Programs
(705) 759-2554, Ext. 2681

I. COURSE DESCRIPTION:

This course will provide the student with an understanding of world and regional environmental issues. Ways of detecting, describing and quantifying the effects of pollutants on ecosystems and their components will be studied through field and laboratory analyses. Types and sources of pollution in our water, air and land, monitoring strategies and legislation governing pollution will be discussed.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. *Discuss types and sources of pollutants and their effects on ecosystems, their components and associated terminology and ecological relationships.*

Potential Elements of the Performance:

- Explain key ecological concepts related to energy, biomass, bioaccumulation and bio-magnification.
- Competently perform respiration focused laboratory experiments, including preparation of several test specimens in a variety of closed system environments.
- Record data, and calculate metabolic rates in relation to dissolved oxygen, carbon dioxide and pH.
- Summarize and analyze results in a comprehensive standardized technical report format.

(This outcome will constitute 20% of the course's grade)

2. *Discuss pollution monitoring with respect to physio-chemical measurements, and toxicology.*

Potential Elements of the Performance:

- Explain methods of measurement and acceptable parameters for a multitude of physio-chemical features.
- Explain effects of a toxicant, and degree of toxicity to living organisms, and testing limitations.
- Explain the purpose and research or complete a bioassay.
- Attend research labs where function and capabilities of analyzing

- equipment and techniques will be discussed.
- Complete a research summary of a pollutant and its environmental impacts.

(This outcome will constitute 20% of the course's grade)

3. *Discuss pollution in regard to bio-monitoring, the biological assessment of water quality, and sampling design.*

Potential Elements of the Performance:

- Explain how bio-monitoring is performed, sampling theory advantages and disadvantages, and stratification design.
- Collect invertebrates using field sampling equipment (Ekman dredge) and complete a species analysis and invertebrate population estimation.
- Plate preparation and bacterial coliform sample inoculation, plate count and colony survey assessment.
- Completion of comprehensive reports of experimental findings including discussion of water-borne fecal pollutants.

(This outcome will constitute 20% of the course's grade)

4. *Research and perform lab experiments, calculations and reports that explore the impacts of pollution (bioassay, spectrophotometry, etc.) on natural systems and their inhabitants.*

Potential Elements of the Performance:

- Explain terms and processes of light penetration, eutrophication, annual temperature profiles, and nutrient cycles.
- Explain the impacts of radioactivity, petroleum products, and heavy metals on freshwater systems.
- Undertake field work in winter conditions; perform data collection and proper water sample collection and assessment techniques using field survey equipment.
- Complete a spectrophotometric analysis of phosphorous in soil.
- Complete a scrapbook of recent articles pertaining to aquatic environment pollution.

(This outcome will constitute 25% of the course's grade)

5. Discuss climate change including atmospheric pollutants, monitoring methodologies, legal responsibilities and latest trends in pollution.

Potential Elements of the Performance:

- Demonstration of air quality monitoring station.
- Discuss atmospheric layers, latest trends in environmental pollution, global warming and climate change.
- Explain legislation pertaining to pollution, roles and responsibilities of compliance.
- Discuss proper sampling procedures.

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

III. TOPICS:

1. **Pollution and Ecological Relationships**
2. **Freshwater Systems**
3. **Types and Sources of Pollutants**
4. **Monitoring of Pollution – Physio-Chemical Measurements and Toxicology**
5. **Monitoring of Pollution – Populations and Ecosystems**
6. **Monitoring of Pollution – Atmospheric Conditions & Climate Change**
7. **Introduction to Legal Responsibilities and Trends in Pollution**

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. Environmental Monitoring and Assessment (NET255) Study Guide
2. Environmental Monitoring and Assessment (NET255) Lab Manual
3. Laboratory coat and lab safety glasses
4. Snowshoes, safety vest, compass, field notebook, and clipboard.

V. EVALUATION PROCESS/GRADING SYSTEM:

Students will be evaluated on the basis of achievement of learning outcomes. These will be determined by:

1. Quizzes/Assignments/Labs	value 60%
2. Theory tests	Test 1 midterm exam 20%
	Test 2 Final exam 20%
	TOTAL VALUE 100%

Late submissions will be penalized -10% per each day late. Students who miss tests will not have an opportunity to rewrite without a valid excuse (i.e. doctor's note). **Attendance is mandatory at all labs and field trips.** In the event of a valid excused absence, students will be required to make up an alternate lab or assignment on their own time. Failure to attend two labs and/or field trips will result in an immediate "F" grade for the course.

The following semester grades will be assigned to students:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
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:

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. *It is the departmental policy that once the classroom door has been enclosed, the learning process has begun. Late arrivers will not be granted admission to the room.*

VI. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.