

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**COURSE OUTLINE**

**COURSE TITLE:** ENVIRONMENTAL MONITORING & ASSESSMENT  
**CODE NO. :** NET 255 **SEMESTER:** W14  
**PROGRAM:** FISH & WILDLIFE TECH  
NATURAL ENVIRONMENT TECH  
**AUTHOR:** T. WINTER (Revised by C. Marcinkowski)  
**DATE:** JAN 2014 **PREVIOUS OUTLINE DATED:** JAN 2013  
**APPROVED:** "Colin Kirkwood"

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Dean

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DATE

**TOTAL CREDITS:** 4

**PREREQUISITE(S):** NIL

**HOURS/WEEK:** 4

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**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.

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.

**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.

**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.

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.

**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 - LMS
2. Environmental Monitoring and Assessment (NET255) Labs - LMS
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:

Quizzes	5%
Lab Reports (5)	25%
Winter Lake Survey Report	20%
Pollutant Report	10%
Midterm Exam	20%
Final Exam	<u>20%</u>
<b>TOTAL VALUE</b>	<b>100%</b>

Late submissions will be penalized -10% per each day late up to 5 days late at which point the resulting grade will be a zero. Students who miss tests will not have an opportunity to rewrite without a valid reason (i.e. doctor's note) or having previously arranged and agreement with the instructor. **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.

**VI. COURSE OUTLINE ADDENDUM:**

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