

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



**SAULT
COLLEGE**

COURSE OUTLINE

COURSE TITLE: ENVIRONMENTAL MONITORING & ASSESSMENT

CODE NO. : NET255 **SEMESTER:** 4

PROGRAM: FISH & WILDLIFE CONSERVATION TECHNICIAN,
NATURAL ENVIRONMENT CONSERVATION
TECHNICIAN/TECHNOLOGIST

AUTHOR: C. MARCINKOWSKI

DATE: DEC 2015 **PREVIOUS OUTLINE DATED:** JAN
2015

APPROVED: COLIN KIRKWOOD
DEC
2015

DEAN **DATE**

TOTAL CREDITS: 4

PREREQUISITE(S): NONE

HOURS/WEEK: 4

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*For additional information, please Dean, Colin Kirkwood
School of Environment, Technology and Business
(705) 759-2554, Ext. 2688*

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.
- Analyze and discuss recent articles pertaining to environment pollution.
- Complete a research summary of a pollutant and its environmental impacts.

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.
- Complete a short-term static bioassay, explain it's purpose and understand terminology associated with it.
- Analyze data collected by using excel to perform calculations and plot toxicity and survivorship curves.
- Discuss proper sampling procedures.

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.
- Summarize and analyze results in a comprehensive standardized technical report format.

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.

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
Introduction to Legal Responsibilities and Trends in Pollution

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. LMS
2. Laboratory coat and lab safety glasses
3. Snowshoes, safety vest, field notebook, and clipboard.

V. EVALUATION PROCESS/GRADING SYSTEM:

Quizzes/Assignments/Discussions	10%
Lab Reports (5)	30%
Winter Lake Survey Report	15%
Pollutant Report	10%
Participation/Attendance	5%
Midterm Exam	15%
Final Exam	<u>15%</u>

TOTAL VALUE 100%

The following semester grades will be assigned to students:

Grade	<u>Definition</u>	<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.

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

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.

Conduct:

Any student who, in the judgement of the instructor, behaves inappropriately in scheduled classes or copies the work of another student without the instructor's permission, will be subject to all the terms and conditions in the student's rights and responsibilities hand book and may, after reviewing the situation with the instructor, be asked to leave the course with an F grade.

Evaluation:

To be eligible to make up for a missed test, the instructor must be contacted via phone or email ASAP to discuss make-up options. **Students not contacting the instructor prior to a missed test/quiz or within a day afterwards will get a zero except under extenuating circumstances; e.g. doctor's note.**

Late assignments **WILL NOT** be accepted, except under extenuating circumstances; e.g., 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.**

Lastly, the instructor cannot guarantee responses to questions in the 24-hour period prior to assignment deadlines and tests/exams via phone message or email.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located in D2L and on the portal form part of this course outline.