

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY  
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: ENVIRONMENTAL ANALYSIS (OUTLINE & LAB MANUAL)  
CODE NO.: FOR 364-6 SEMESTER: V  
PROGRAM: FISH AND WILDLIFE TECHNOLOGY  
AUTHOR: VALERIE WALKER  
DATE: JANUARY 1990 PREVIOUS OUTLINE DATED: JANUARY 1989

APPROVED:

DEAN



DATE

Feb 13/90

**PHILOSOPHY/GOALS:**

This lab-based course provides the measurement and analysis of various parameters within the environment as well as a discussion of their significance. Topics include instrument operation, calibration and standardization and proper laboratory techniques. Labs will examine primary production, oxygen consumption in aquatic systems, response of organisms to a toxicant (bioassay) and the buffering capacity of Lakes as related to acid precipitation. Outdoor Labs will examine temperature and oxygen stratification of lakes in winter, the effect of ice on lake productivity and snow density and snow type and its impact on wildlife. In addition, organic molecules of importance as related to the nutritional requirements of wildlife, will be studied with a practical application to bomb calorimetry.

**METHOD OF ASSESSMENT (GRADING METHOD):**

- A - 80%
- B - 70%
- C - 60%
- R - less than 60%

Lab Reports	- 50%
Term Tests (3)	- 50%
	<u>100%</u>

**EVALUATION:**

Due to the practical nature of this course and the emphasis on laboratory technique and data interpretation, there will be no opportunity for a "rewrite".

Students with a final grade of less than 60% will receive an "R" grade. All labs must be submitted for a passing grade.

**ATTENDANCE:**

Lab attendance is **compulsory**. Students missing labs without documented reason run the risk of repeating the course.

**TEXTBOOK(S):**

No textbook required for purchase. Lab manual is available at Campus Bookstore. Several reference books are on reserve at the Learning Resources Centre.

**EQUIPMENT:**

- lab coat
- safety glasses



LECTURE/LAB FORMAT

WEEK

- 1        Introduction
- evaluation
  - course outline
  - lab safety
  - lab equipment
- 1        **Lab 1        Densities of Liquids and Solids**
- 1-3     Unit I:        Freshwater Systems
- lotic and lentic environments
  - food chains and food transfer effects
  - recycling
  - seasonal production cycles
  - factors affecting primary productivity
  - stability of ecosystems
- 2        **Lab 2        Primary Production in Standing Water**
- 4        Unit II:        Oxygen Consumption in Aquatic Animals
- factors affecting oxygen consumption
  - oxygen as a limiting factor
- 4        **Lab 3        Temperature & Oxygen Consumption in Aquatic Animals**
- 5        **TERM TEST #1**
- 5,6     Unit III:        Aquatic Pollutants
- definition of pollution
  - categories of contamination
  - acidification (SPEAKER)
  - toxicity terminology
  - environmental factors affecting toxicity
  - biomagnification
  - biossays
  - (Videos - H<sub>2</sub> Overview, Early Warning)

ENVIRONMENTAL ANALYSIS - OUTLINE & LAB MANUAL FOR 364-6

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- 7        **Lab 4**        **Total Inflection Point Alkalinity**
- 8        **Lab 5**        **Bioassay**
- 8        - (Speaker: Sea Lamprey)
- 9        **TERM TEST #2**
- 9,10    Unit IV - Winter Surveys
- inverse stratification of lakes
  - ice formation and its effect on light, production, oxygen
  - snow compaction, chillometer
  - physics of snow
- 10       **Lab 6**        **Winter Lake Survey/Snow Study**
- 11,12   Unit V:        Organic Molecules in Wildlife Nutrition
- required nutrients:
    - water
    - protein
    - carbohydrates
    - lipids
  - energy metabolism
  - macrominerals
  - micro (trace) minerals
- 12       **Lab 7 (a)**    **Bomb Calorimetry - Sample Preparation**
- 13       **LAB 7 (b)**    **Bomb Calorimetry - Bombing**
- 14       **TERM TEST #3**

N.B. SCHEDULE SUBJECT TO CHANGE