DOC. 230

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: WATER POLLUTION (Outline & Lab Manual)

CODE NO.: BIO 129-4

PROGRAM: WATER RESOURCES TECHNOLOGY/PULP & PAPER ENGINEERING TECHNOL.

SEMESTER: II V

AUTHOR: V. WALKER

DATE: FEBRUARY 1990 PREVIOUS OUTLINE DATED: JANUARY 1989

APPROVED: _____ DEAN _____ Feb 26/90 DATE

Water Pollution	BIO 129-4
COURSE NAME	COURSE NUMBER

PREREQUISITE: AQUATIC BIOLOGY 125-3

PHILOSOPHY/GOALS:

This is a course designed to provide an introduction to the biological effects of water pollution and to ways of detecting, describing and quantifying these effects in the field and the laboratory. Types and sources of pollution, sampling strategies and legislation governing water quality will be discussed.

METHOD OF ASSESSMENT (GRADING METHOD):

Oral Presentation:	10 marks	90% & over - A+
Lab Reports	50 marks	80 - A
Term Tests (3)	40 marks	70 - B
		60 - C
	100 marks	Under 60% - R

ATTENDANCE:

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

EVALUATION

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

TEXTBOOK(S):

Water Pollution Outline & Lab Manual

Optional Purchase:

1. Mason, C. F., 1981. Biology of Freshwater Pollution. Longman Group Ltd., New York.
2. Vallentyne, J.R. 1974. The Algae Bowl. Lakes and Man. Canada Dept. of the Environment, Fish and Marine Service, Misc. Spec. Pub. No. 22:186 pp.

WATER RESOURCES TECHNOLOGY
BIO 129-4
WATER POLLUTION

WEEK

1,2	**UNIT 1**	**INTRODUCTION**
		- what is pollution? - complexity of pollution - the ecosystem concept - (Video: Great Lakes Troubled Waters)
2,3,4	**UNIT 2**	**FRESHWATER SYSTEMS**
		- general characteristics - the lotic environment - the lentic environment - stability of ecosystems - seasonal production cycles
3	LAB 1	WINTER LAKE STUDY
4	TERM TEST #1	
5,6	**UNIT 3**	**TYPES AND SOURCES OF POLLUTION**
		- Water pollution categories: - disease causing agents - inorganic chemicals and minerals - plant nutrients (nitrogen, phosphorus cycles) - sediments - heat - radioactive substances - oxygen demanding wastes - synthetic organic chemicals
5	LAB 2	PRIMARY PRODUCTION OF STANDING WATER
		- major sources of water pollution - (Video: Early Warning) - (Speaker: Pollution Probe)
7	LAB 3	TEMPERATURE AND OXYGEN
7,8,9	**UNIT 4**	**TOXICOLOGY**
		- types of toxic pollutants - toxicity - acute toxicity determination - factors affecting toxicity - (Video: H_2 Overview)
9	TERM TEST #2	

WEEK		
10	LAB 4	BIOASSAY
10,11	**UNIT 5**	**BIOLOGICAL ASPECTS OF WATER POLLUTION** - eutrophication - macroinvertebrates - bacteria - algae - fish - (Speaker: MOE)
12	LAB 5	STANDARD BACTERIAL PLATE COUNT AND BACTERIAL STAINING
12, 13	**UNIT 6**	**STUDENT PRESENTATIONS**
14	**UNIT 7**	**SAMPLING FOR WATER QUALITY** - (Speaker: EB Eddy representative) - apparatus - sampling sites - sampling strategy - (Speaker: APHU) - index species (SCI, biotic, diversity, indices)
15	**UNIT 8**	**LEGAL ASPECTS OF WATER POLLUTION** - acts and legislation governing water quality - MOE speaker - (Video: Speaking Out - The Politics of Garbage) - (Video: Strike Force)
15	TERM TEST #3	

NOTE: Schedule subject to change

LAB SCHEDULE

1. Lab 1. Winter Lake Study
2. Lab 2. Primary Production of Standing Water
3. Lab 3. Temperature and Oxygen Consumption in Aquatic Organisms
4. Lab 4. Bioassay
5. Lab 5. Standard Bacterial Plate Count/Bacterial Staining

*Subject to change

PRESENTATION TOPICS

Students are required to deliver a 20-minute oral presentation during a predetermined time slot. Presentations will include visual aids as well as oral material delivered by each student. Term Test #3 will include information from students' presentations. The following topics are available for presentation:

NOTE: RELATE YOUR TOPIC TO WATER POLLUTION.

1. Metals (including mercury)
2. PCB's
3. Oil
4. Insecticides
5. Pulp mill wastes
6. Waste heat, (thermal pollution)
7. Nuclear pollution (radioactive waste)
8. Dioxin
9. Herbicides (2,4D; Glyphosate; Hexazinone)
10. Detergents
11. Acid rain

12. Mirex
13. Water-borne pathogens
14. Food Processing Wastes
15. Furans

NOTE: INCLUDE IN EACH PRESENTATION:

1. Description of the pollutant.
2. Sources of the pollutant (natural, man-caused).
3. The effect of the pollutant on the aquatic environment.
4. The water quality guidelines (standards) for the pollutant.
5. Any pertinent incidents* involving the pollutant.
6. Clean up/Controls (if applicable).

*Canadian incidents if possible

Each student is responsible for producing a typed abstract (summary) of information presented as well as a list of references used.

Copies of each presentation summary and reference list will be produced (by instructor) for all students, prior to each presentation.