

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

COURSE OUTLINE

Course Title: APPLIED MICROBIOLOGY
Code No.: WTR 325-4
Program: WATER RESOURCES ENGINEERING TECHNOLOGY
Semester: V
Date: DECEMBER 1987
Author: JOHN K. THEIL

New;

Revision;

X (5)

APPROVED:


Chairperson


Date

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CALENDAR DESCRIPTION

MICROBIOLOGY OF WASTEWATERS

WTR 325-4

Course Name

Course Number

PHILOSOPHY/GOALS;

To acquaint students with the fundamentals of microbiology and practical implementation of microbiological principles with respect to environmental significance, water quality assessment and wastewater treatment requirements.

METHOD OF ASSESSMENT (GRADING METHOD):

Laboratory Work/Assignments	30%
Interim Examinations 3 @ 15%	45%
Final Examination	25%

GRADING;

A passing grade will be based on a composite grading of 60%. Students obtaining a composite grading of 55 to 59% may be allowed to complete a supplementary examination.

A+	90-100%	A	80-89%	B	70-79%	C	60-69%
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TEXTBOOK(S);

McKane, Larry and Judy Kandel; Microbiology, Essentials and Applications; McGraw-Hill Book Company.

REFERENCE TEXT;

Pelczar, Jr., M J.; R.D. Reid and E.C.S. Chan, Microbiology- Fifth Edition; McGraw-Hill Book Company.

OBJECTIVES;

The student will be able to:

1. Determine the basic requirements and procedures for microscopic observations of microorganisms.
2. Demonstrate the presence of microorganisms in the air and on various surfaces.
3. Prepare and examine microscopically hanging drop and temporary wet mount specimens.
4. Observe size differences and shapes of bacteria.
5. Distinguish mobility of bacteria and observe mobility of algae and protozoa.
6. Carry out staining procedures.
7. Prepare culture media, and perform sterilization and media inoculation.
8. Perform the pour-plate and membrane filtration techniques.
9. Isolate individual bacteria cultures by streak plate separation.
10. Identify microorganisms of importance in water quality and wastewater treatment applications.
11. Perform microscopic observation of protozoa and determine relative predominance of the various classes of protozoa in mixed liquor of an activated sludge plant.
12. Observe algae and cyanobacteria for the purposes of classification and identification and describe the organisms with respect to importance in surface waters.
13. Carry out mycological culture techniques and identify structural components of fungi.
14. Determine kinetic constants and apply mathematical equations for the design and operation of biological wastewater treatment processes.

COURSE OUTLINE

<u>UNIT</u>	<u>TOPIC</u>	<u>HOURS</u>
1	Microbes in the Environment Microbial Activities Microbes and Human Disease	4
2	Eucaryotes and Procaryotes	2
3	Microscopic Observations Microbiologic Stains	5
4	Morphology of Bacteria Cell Structure	1
5	Classification of Procaryotes	2
6	Bacterial Growth/Reproduction Culture Media Culture/Identification Techniques Measuring Microbial Concentration	3
7	Distribution and Biological Activities of Protozoa Classification of Protozoa Protozoan Diseases	3
8	Identification/Classification of Algae Algae in Water Supplies	2
9	Morphology/Classification of Fungi Diseases Caused by Fungi	3
10	Principles of biological kinetics Kinetic constants	4
11	Control of Microorganisms	2
12	Principles of Epidemiology	3
		34
	Laboratory Experiments	20
	Interim Tests	5
	Review	1