DOC. 77

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: ORGANIC CHEMISTRY

CODE NO.: CHM 235-3 **SEMESTER:** V

PROGRAM: PULP & PAPER TECHNOLOGY/WATER RES. ENGINEERING TY

AUTHOR: D. TROWBRIDGE

DATE: OCTOBER 1992 **PREVIOUS OUTLINE DATED:** MARCH 1992

APPROVED: _____ DEAN _____ DATE 10/15/92

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TOTAL CREDIT HOURS: 48

PREREQUISITE(S): CHM 104

I. PHILOSOPHY/GOALS:

This course is intended to give an introduction to the subject of organic chemistry. Upon successful completion, the student should be able to identify the name of organic compounds as well as predict likely reactions between these compounds. Emphasis will be placed on organic chemistry as it relates to the pulp and paper industry and organic compounds in the environment.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will be able to:

1. Discuss the principles of bonding, structure and reactivity of organic compounds.
2. Write the correct nomenclature for common organic compounds.
3. Describe the role of organic compounds in the pulp and paper industry and their impact on the environment.
4. Discuss the major types of organic pollutants in the environment, including their method of analysis and treatment.

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III. TOPICS TO BE COVERED:

TOPIC	TOPIC DESCRIPTION
1	Principles of Bonding (5 hours) - covalent and ionic bonding - electronegativity and formal charge - hydrogen bonding (including cellulose) - bond strength and hybridization
2	Principles of Structure (5 hours) - structural formula - molecular models - isomerism and resonance - functional groups
3	Principles of Reactivity (2 hours) - acid-base theories - dissociation constants - equilibrium and reaction rates - catalysts, intermediates and free radicals
4	Alkanes and Alkenes (7 hours) - structure and nomenclature - physical properties - synthesis and reactions
5	Dienes and Alkynes (1 hour) - classification and nomenclature - tautomers

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III. TOPICS TO BE COVERED (Continued):

TOPIC	TOPIC DESCRIPTION
6	Aromatic Hydrocarbons (2 hours) - benzene and its derivatives - structural properties - reactions with benzene
7	Alcohols, Phenols and Thiols (4 hours) - classification, structure and nomenclature - examples in the pulp and paper industry - oxidation of alcohols
8	Aldehydes, Ketones and Acids (5 hours) - structure and nomenclature - physical properties - oxidation of aldehydes
9	Ethers and Epoxides (3 hours) - structure and nomenclature - lignin and cellulose ethers
10	Polymers (2 hours) - macromolecule formation - cellulose and hemicellulose structure and properties
11	Common Environmental Pollutants (3 hours) - organochlorides, PAH, furan, dioxin etc.

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IV. EVALUATION METHODS: (INCLUDES ASSIGNMENTS, ATTENDANCE REQUIREMENTS ETC.)

Periodic tests throughout the course will be included with assignments and quizzes to establish the overall grade for the course.

Tests	60%
Assignments, Quizzes	40%

NOTE: One major assignment worth 20% of the overall grade will be based on topics relating to the student's field of study.

Marks are cumulative and 60% is considered a passing mark.

A+ = 90% A = 80-89% B = 70-79% C = 60-69%

V. REQUIRED STUDENT RESOURCES:

Introduction to Organic and Biochemistry by William H. Brown, 4th edition, 1989, published by Brooks/Cole Publishing.

VI. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY BOOK SECTION:

1. Organic Chemistry by Hendrickson, Cram and Hammond, 1970, published by McGraw-Hill.

   Call No. QD 251 H47 1970

2. Organic Chemistry by R.T. Morrison, 1973, published by Allyn and Bacon.

   Call No. QD 251 M72 1973

3. Nomenclature of Organic Compounds by J.H. Fletcher, 1973, published by American Chemical Society

   Call No. QD 291 F55

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VII. SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.