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CALENDAR DESCRIPTION

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

The course is designed to give the student an understanding of the role of the analytical chemist in industry and laboratory which will serve as a basis for further study in instrumentation I.

Course Title: ANALYTICAL CHEMISTRY - INSTRUMENTATION I

Code No.: CHM 221-4

Program: WATER RESOURCES ENGINEERING TECHNOLOGY


Semester: FOUR

Date: APRIL 1988

Author: DOUG HEGGART/TROWBRIDGE

TEXTBOOK(S):

New: _____ Revision: X

APPROVED: 
Chairperson

April 27/88
Date

CALENDAR DESCRIPTION

ANALYTICAL CHEMISTRY - INSTRUMENTATION I

CHM 221

Course Name

Course Number

PHILOSOPHY/GOALS:

The course is designed to give the student an understanding of the role Instrumentation has in Analytical Chemistry. The course involves theory and laboratory which will serve as a basis for Analytical Chemistry - Instrumentation II taught in semester five.

METHOD OF ASSESSMENT (GRADING METHOD):

Final Grade - Theory	50%		
Lab	50%		
		Theory - Assignments and Quizzes	20%
		- Mid-term test	30%
		- Final test	50%

Late labs will be marked but will be downgraded 10% per week while late assignments will not be accepted.

TEXTBOOK(S):

Introduction of Chemical Analysis - Braun, McGraw-Hill, 1982

Undergraduate Instrumental Analysis - 3rd Edition, Robinson, Dekker, 1982

[Signature]
Date

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Chairperson

APPROVED:

TOPIC NO.	TOPIC DESCRIPTION
1	<p>Working Curves and Standards</p> <ul style="list-style-type: none">- non-linear- linear- method of standard additions- curve fitting - least squares fit- Assignment #1- Quiz #1
2	<p>Molecular Spectroscopy</p> <ul style="list-style-type: none">- review of atomic physics as it relates to EMR- development of Beer-Lambert Law- criteria for selection of for an Absorption measurement- analysis based on light scattering - turbidimetry - nephelometry- end point detection using Absorption measurement- determination of K_a using Absorption measurement- Assignments #2 and #3- Quiz #2- Mid-Term
3	<p>Atomic Absorption</p> <ul style="list-style-type: none">- comparison of AAS, AFS, FES, AES- double beam vs. single beam- application- advantages and limitations- interferences- monochromators, detectors- Assignment #4
4	<p>Chromatography</p> <ul style="list-style-type: none">- types of chromatography - HPLC, GC<ul style="list-style-type: none">- Column, Paper- TLC, Ion-exchange- electrophoresis- stationary Phase, Mobile Phase, Carrier Gas- Detectors- Qualitative and Quantitative aspects of G.C.- retention time and retention volume- efficiency, HETP, n- resolution, symmetry- Column Types- Assignment #5

- LABS:
1. Spectrophotometric - a) determination of Fe in H₂O
b) determination of phenol in H₂O
c) determination of pb in H₂O
 2. Potentiometric I - a) determination of [HOAC] in H₂O
b) determination of [H₃PO₄]
 3. Atomic Absorption - a) determination of [Ca]
b) determination of [Mg]
c) determination of water hardness
 4. Potentiometric II - using Specific Ion Electrodes:
a) determination of Cl⁻ in H₂O
b) plotting first and second derivative curves
 5. Optical - determination of optical activity
 6. Chromatography - a) hydrocarbons in H₂O
b) Qualitative and Quantitative determination
c) parameter adjustments