SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: INTRODUCTION TO INDUSTRIAL HYGIENE

Code No.: CHM 216-4

Program: PULP & PAPER ENG. TECH.

Semester: TWO

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Date: DECEMBER 1991 Previous Outline Dated: MAY 1988

APPROVED: _____ Dean _____ Date

Jan 2/92

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PREREQUISITE: None

CREDIT HOURS: 64

I. PHILOSOPHY/GOALS:

The goal of this course is to give the student a comprehensive knowledge of the principles of industrial hygiene - Recognition, Evaluation and Control Methods - to qualify him/her to function in the Health and Safety Department of a Pulp or Paper mill.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course, the student will:

1. understand the role of industrial hygiene with regards to the pulp & paper industry.
2. understand the main objectives of the Occupational Health and Safety Act and related regulations.
3. recognize, evaluate and control chemical hazards.
4. recognize, evaluate and control physical hazards.

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III. TOPICS TO BE COVERED:

1. INTRODUCTION

AIHA definition of Industrial Hygiene
Historical Developments, ACGIH, AIHA, OSH Act, NIOSH
Bills 139 and 70, OHSA 1978
Personnel responsible for Occupational Health Programs

2. PRINCIPLES OF INDUSTRIAL HYGIENE

Recognition of potential hazards assimilation of process and procedures data

Evaluation - preliminary survey
- environmental survey

Control - engineering
- administrative

Toxicity vs Hazard

3. CLASSIFICATION OF STRESSES

A. Chemical: gases, vapours, dusts
B. Physical: noise, radiation, thermal, stresses, pressure, vibration
C. Biological: bacteria, fungi, moulds, viruses
D. Ergonomic

A. Chemical Stresses

1. Recognition
   - Dose - response relationship
   - LD50, LC50 concepts
   - Routes of entry
   - Mode of action
   - TLV concept
   - Documentation of the TLV
   - Classification of toxic effects

2. Evaluation
   - Preliminary survey
   - Environmental survey
   - Grab sampling - bags
     - syringes
     - bombs
     - detector tubes
     - direct-reading instruments
     - hi-vol samples

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III. TOPICS TO BE COVERED: (cont'd)

Integrated sampling
(a) personal and personnel sample bags
absorbant tubes
paper tapes
long-term detector tubes
gas badges
filters
cyclones
(b) area or "fixed-station" monitoring

3. Control
Substitution
Isolation, segregation
Local exhaust, ventilation
Dilution ventilation
Personal protective devices
Area monitoring as a control method
Work rotation
Education and training

B. Physical Stresses

1. Noise

1. Recognition
Classification of hearing loss
Effects of excessive noise
Subjective aspects of sound
Hazards associated with hearing loss
Principles of sound
Sound pressure and sound pressure level
Combination of sound pressure levels
Frequency bandwidths, octave bands
Equal loudness contours
Weighting scales
Noise exposure guidelines
Noise dosage

2. Evaluation
Sound level meters-types
Calibrators
Octave band analyzers
Dosimeters

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III. TOPICS TO BE COVERED: (cont'd)

3. Control
   - Substitution
   - Isolation, segregation
   - Specifications on new equipment purchases
   - Maintenance
   - Acoustical treatment
   - Enclosures, noise alteration at source
   - Andiometric examinations
   - Work rotation
   - Personal protective devices
   - Noise conservation programs

2. Ventilation

   - basic design
   - parts of a system
   - terminology
     - dilution
     - local exhaust
     - K valve
     - dilution for fire & explosion control
     - TLV vs. LEL
   - inerting

C. Legislation

- historical overview
- the occupation Health & Safety Act
- regulations
- designated substances

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III. TOPICS TO BE COVERED: (cont'd)

The following chapters from Fundamentals of Industrial Hygiene serve as the basis for this course:

1 - Fundamental Concepts

6 - Solvents

7 - Particulates

15 - Industrial Toxicology

16 - Evaluation

17 - Method of Evaluation

18 - Air Sampling Instruments

19 - Direct Reading Gas & Vapor Monitors

20 - Methods of Control

21 - Industrial Ventilation

22 - General Ventilation

23 - Respiratory Protective Equipment

4 - The Ear

9 - Industrial Noise

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IV. EVALUATION METHOD:

Student will be evaluated on the basis of their performance on tests, literature-search projects, assignments, final exam and class participation.

METHOD OF GRADING:

Grade		
	90%+	A+
80 -	89%	A
70 -	79%	B
60 -	69%	C
	<60%	R

EVALUATION: Term Tests, Quizzes, Assignments, Midterm - 50%
Final Exam - 50%

V. REFERENCE TEXTS:

Fundamentals of Industrial Hygiene, 3rd ed., Olishifski, J.B. ed., National Safety Council (1979)

The Occupational Health & Safety Act (1978)

VI. ADDITIONAL RESOURCE MATERIAL:

1. "The Industrial Environment - Its Evaluation and Control" U.S. Dept. of Health, Education and Welfare (1973)

2. "Basic Industrial Hygiene" - American Industrial Hygiene Assoc. (1975)

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.