

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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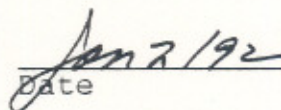
Date: DECEMBER 1991 Previous Outline Dated: MAY 1988

APPROVED:

Dean



Date



INTRODUCTION TO INDUSTRIAL HYGIENE CHM 216-4

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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, OSHA 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

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.

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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

<u>EVALUATION:</u>	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:

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