

SAULT COLLEGE
of Applied Arts and Technology
Sault Ste. Marie

COURSE OUTLINE

CHM 217

INDUSTRIAL TOXICOLOGY

CHEMICAL ENGINEERING PROGRAM

revised Doug Heggart, October, 1982

INDUSTRIAL TOXICOLOGY

CHM 217

SEMESTER 4

4 hrs/week

TOTAL HOURS - 60

COURSE SYLLABUS

1. Industrial Toxicology
 - a) historical background
 - b) definitions
 - c) concepts
2. Diagnosis and classification of Industrial disease.
3. Classification of chemically induced hazards; Evaluation and measurement of hazards.
4. Entry routes of toxic substances, and factors affecting uptake and disposition in the body.
5. Modes of action of toxic substances on:
 - a) respiratory system
 - b) skin
 - c) special senses
 - d) liver
 - e) kidney
 - f) digestive system
6. Effects of chemical compounds: General inorganic.
7. Effects of chemical compounds: General organic.
8. Effects of polymers and dusts.
9. Effects of radiations and biological hazards.
10. Effects of metal exposure.
11. Methods of control of toxic substances: Standardization of exposure.
12. Methods of control of toxic substances: Sampling and measurement techniques.
13. Epidemiology - Methodology
14. Seminar work

COURSE TEXTS

1. Industrial Health, J. E. Peterson, Prentice-Hall, (1977).
2. Patty's Industrial Hygiene and Toxicology. Volume I, General Principles, 3rd Revised Edition, G.D. Clayton & F. Clayton, John Wiley & Sons, (1978).

FACTORS AFFECTING TOXICITY

1. Introduction to Toxicology

- a) dose response concept
- b) toxicity
- c) hazard
- d) physical factors affecting toxicity

2. Design of Toxicological Studies

- a) selection of animal species and numbers of animals and controls
- b) selection of route of administration
- c) determination of dose levels.
- d) determination of biologically insignificant (safe) levels
- e) evaluation of data
- f) extrapolation to man:
 - i) TLV-TWA determination
 - ii) excursions
 - iii) skin
 - iv) ceiling
 - v) numerical computations.

3. General Toxicological Tests

- a) Class I
 - Acute tests (single dose)
 - examples
 - i) ingestion
 - ii) patch test
 - iii) primary irritation
 - iv) skin sensitization
- b) Class II
 - Sub-chronic tests (daily doses)
 - examples
 - i) inhalation
 - ii) ingestion
 - iii) cutaneous
- c) Class III
 - Chronic tests (daily doses)
 - examples
 - i) inhalation
 - ii) ingestion
- d) Special Tests
 - reproduction
 - teratogenicity
 - carcinogenicity
 - mutagenicity

4. LD₅₀ classifications - oral, absorption, inhalation