

**CUYAMACA COLLEGE**  
**COURSE OUTLINE OF RECORD**

**ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT 130 –ENVIRONMENTAL & OCCUPATIONAL HEALTH EFFECTS OF HAZARDOUS MATERIALS**

3 hours lecture, 3 units

**Catalog Description**

Study of the acute and chronic health effects produced by exposure to chemical, physical, and biological agents. Topics include routes of entry, toxic effects, risk evaluation, permissible exposure limits, medical surveillance, control methods for reducing exposure, and using Safety Data Sheets (SDS) to develop strategies to reduce worker exposure.

**Prerequisite**

None

**Course Content**

- 1) Types of environmental health hazards
- 2) Exposure and entry routes
- 3) Routes of chemical absorption, distribution, and elimination
- 4) Dose-response relation (dose of exposure)
- 5) Duration of exposure
- 6) Action of toxic substances
- 7) Effects of exposure to air contaminants
- 8) Target organ effects
- 9) Regulations and standards
- 10) Exposure guidelines and limits
- 11) Monitoring of harmful agents
- 12) Control methods
- 13) Medical monitoring
- 14) Source of toxic information
- 15) Risk evaluation
- 16) Survey of common toxic substances

**Course Objectives**

Students will be able to:

- 1) Define common health effects and toxicology of hazardous materials.
- 2) Describe toxic effects of hazardous materials, including comparing and contrasting acute versus chronic health effects of hazardous materials.
- 3) Describe toxic actions of toxic substances and their effects on target organs.
- 4) Distinguish dose-response relation (dose exposure) of toxic substances.
- 5) Evaluate and design appropriate medical surveillance control measures for reducing exposure to hazardous materials.
- 6) Evaluate, analyze and design risk assessment programs of selected hazardous materials; identify and explain exposure guidelines and limits.

**Method of Evaluation**

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Quizzes, exams, and written research paper and oral presentation which measure students' ability to:
  - a. Describe toxic effects of hazardous materials and evaluate risk and permissible exposure limits.
  - b. Identify control methods for reducing exposure and sources of toxicology to toxic hazards.
  - c. Develop strategies to reduce worker exposure.

**Special Materials Required of Student**

None

**Minimum Instructional Facilities**

Smart classroom

**Method of Instruction**

- 1) Lecture and discussion
- 2) Projects

**Out of Class Assignments**

- 1) Reading assignments
- 2) Writing assignments
- 3) Projects
- 4) Reports

**Texts and References**

- 1) Required (representative example): James, R.J., Roberts, S.M., Williams, P.L. (2022). *Principles of Toxicology: Environmental and Industrial Applications*. (4th Edition). Wiley. ISBN 9781119635161.
- 2) Supplemental: *NIOSH Pocket Guide to Chemical Hazards*. U.S. Department of Health Services, Center for Disease Control (latest edition).

**Student Learning Outcomes**

Upon successful completion of this course, students will be able to:

- 1) Define common health effects and toxicology of hazardous materials including comparing and contrasting acute versus chronic health effects of hazardous materials.
- 2) Describe toxic actions of hazardous substances and their effects on target organs and distinguish dose-response relation (dose exposure) of toxic substances.
- 3) Evaluate, identify and explain exposure guidelines and limits and appropriate medical surveillance control measures for reducing exposure to hazardous materials.