

Lecture Contact Hours: 48-54; Outside-of-Class Hours: 96-108;
Laboratory Contact Hours: 48-54; Outside-of-Class Hours: 0;
Total Student Learning Hours: 192-216

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

Environmental Health and Safety Management 201 – Introduction to Industrial Hygiene and Occupational Health

3 hours lecture, 3 units
3 hours laboratory, 1 unit
Total units: 4

Catalog Description

Introduction to the principles of anticipating, recognizing, evaluating, and controlling biological, chemical, and physical hazards in occupational settings. Examination of the historical development of industrial hygiene and occupational health and safety as professional disciplines. Emphasis on basic physiological processes and the health effects associated with occupational exposures. Includes an overview of occupational health and safety programs and applicable government regulations. Covers industrial hygiene monitoring and sampling techniques for airborne chemical contaminants and physical hazards such as noise, heat, and ionizing and non-ionizing radiation.

Recommended Preparation

“C” grade or higher or “Pass” in EHSM 100 or equivalent or concurrent enrollment

Entrance Skills

Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed:

- 1) Interpret laws and regulations pertaining to environmental, health and safety management and related programs.
- 2) Distinguish between EHSM agencies that regulate environmental management and OSH programs.
- 3) Recognize and apply appropriate terms common to the environmental health and safety industry.
- 4) Understand best management practices (BMP) and safe operation procedures (SOP) used in the EHSM industry.

Course Content

- 1) Historical overview of industrial hygiene and essential terminologies
- 2) Chemical, physical, biological and ergonomic hazards
- 3) Industrial hygiene programs
- 4) Radiation safety specifics
- 5) Ergonomic hazard mitigation principles and application
- 6) Pathological effects of exposure to harmful materials or substances
- 7) Principles of industrial ventilation
- 8) Basic industrial hygiene monitoring equipment and sample analysis

Course Objectives

Students will be able to:

- 1) Identify and relate key historical elements to current regulations and accepted practices in industrial hygiene and occupational safety.
- 2) Interpret, analyze, critique and evaluate sampling procedures and related health and safety reports.
- 3) Demonstrate the proper use, preparation, and calibration of industrial hygiene equipment.
- 4) Develop a health and safety plan outline that includes hearing conservation requirements and respiratory protection requirements and related workplace monitoring.

- 5) Identify appropriate radiation safety requirements used during the storage, handling and disposal of radioactive material.
- 6) Evaluate ergonomic deficiencies and apply appropriate ergonomic principles to correct/improve the working conditions as demonstrated through a written examination.
- 7) Identify and discuss the pathological effects to human anatomy and physiological processes caused by exposure to harmful agents as they relate to occupational exposure.
- 8) Develop a laboratory and biohazards safety outline using current laws and regulations.

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) Verbal and written exercises, quizzes, exams that measure students' ability to identify and relate key historical elements to current regulations and accepted practices in industrial hygiene and occupational safety, interpret, analyze, critique and evaluate sampling procedures and related health and safety reports, and demonstrate a basic knowledge of the pathological effects to human anatomy and physiological processes caused by exposure to harmful agents as it relates to occupational exposures.
- 2) Participation/group exercises that measure students' ability to develop a health and safety plan outline that includes hearing conservation and respiratory protection requirements and related workplace monitoring, evaluate ergonomic deficiencies and apply appropriate ergonomic principles to correct/improve the working conditions, and develop a laboratory and biohazards safety outline using current laws and regulations.
- 3) Hands-on activities, including lab exercises that measure students' ability to demonstrate the proper use, preparation and calibration of industrial hygiene equipment.

Special Materials Required of Student

Basic scientific calculator

Minimum Instructional Facilities

Smart classroom and preferable access to a biology or chemistry laboratory

Method of Instruction

- 1) Lecture and discussion
- 2) Projects
- 3) Lab assignments, projects

Out-of-Class Assignments

- 1) **Reading:** lecture notes; course materials such as NIOSH Pocket Guide and ACGIH TLV Booklet; OSHA regulations; manuals;
- 2) **Writing / Problem-Solving:** Student created summaries, study guides on chemical hazards, Weekly worksheets.
- 3) **Other:** exam preparation activities, including practice tests and concept reviews, create safety presentations.

Texts and References

- 1) Required (representative example): Nilan & Elam. *Fundamentals of Industrial Hygiene*. 7th edition. National Safety Council, 2021.
- 2) Supplemental:
 - a. National Institute for Occupational Safety and Health. *NIOSH Pocket Guide to Chemical Hazards*. US Department of Health and Human Services, 2020.
 - b. American Conference of Governmental Industrial Hygienists (ACGIH). *Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs)*. 2025.

Student Learning Outcomes

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

- 1) Identify and relate key historical elements to current regulations and accepted practices in industrial hygiene and occupational safety.
- 2) Demonstrate the proper use, preparation and calibration of industrial hygiene equipment.
- 3) Anticipate, recognize, evaluate and control workplace hazards by applying the scientific method to quantify chemical, and physical stressors.
- 4) Using the hierarchy of controls, select appropriate control method to effectively minimize risk of injury or illness.
- 5) Identify appropriate radiation safety requirements.
- 6) Identify and explain the pathological effects to human anatomy and physiological processes caused by exposure to harmful agents as it relates to occupational exposure.