CNST-1770: HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE

Cuyahoga Community College

Viewing: CNST-1770 : Hazardous Waste Operations and Emergency Response

Board of Trustees:
December 2023

Academic Term:
Fall 2024

Subject Code
CNST - Construction Engineering Tech

Course Number:
1770

Title:
Hazardous Waste Operations and Emergency Response

Catalog Description:
Comprehensive instruction in the health and safety planning and procedures for 1) uncontrolled hazardous waste site work; 2) hazardous waste treatment, storage or disposal facilities (TSDFs) work; and 3) emergency responses to hazardous materials releases. Meets OSHA's certification requirements for the "40 hour" off-site training portion of 29 CFR 1910.120 (the "HAZWOPER" standard).

Credit Hour(s):
2

Lecture Hour(s):
1

Lab Hour(s):
3

Requisites

Prerequisite and Corequisite
None

Outcomes

Course Outcome(s):
Identify and interpret potential chemical, biological, health, safety and toxicological hazards using reference guides, books, and related resources.

Essential Learning Outcome Mapping:
Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):
1. Apply the requirements of the Occupational Safety and Health Administration's "HAZWOPER" standard (29 CFR 1910.120) to provided scenarios.
2. Explain associated HAZWOPER terminology including acronyms, instrument and equipment names, and regulatory definitions.
3. Recognize the potential chemical, biological, health, safety and toxicological hazards associated with various chemicals.
4. Discuss basic principles of risk management as it relates to toxicology.
5. Prepare an Immediate Action Guide for one chemical.

Course Outcome(s):
Determine potential exposures through utilization of monitoring equipment, devices and instrumentation.

Essential Learning Outcome Mapping:

Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):

1. Recognize the types of monitoring equipment, devices and instrumentation.
2. Explain the purpose, use, functions and application of monitoring equipment within the workplace or field.
3. Hands-on application of various monitoring devices, equipment and instrumentation in the lab setting.

Course Outcome(s):

Explain the purpose and utilization of appropriate personal protective equipment (PPE) associated with potential exposures including levels of protection, selection, donning, and disposal.

Essential Learning Outcome Mapping:

Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):

1. Recognize and compare the types of personal protective equipment (PPE) as each are designed for different chemical hazards and offer levels of protections and applications.
2. Understand appropriate selection process, acquire skills to assemble, and don appropriate PPE based on scenarios.
3. Recognize chemicals hazards in the field or workplace to develop plan for responding to various emergencies common.
4. Recognize the chemical hazard within the field or work environment that present different types of hazards (inhalation, ingestion, dermal).

Course Outcome(s):

Develop and implement decontamination plan and field operations.

Essential Learning Outcome Mapping:

Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):

1. Recognize chemical hazards in the field or work place to develop and prepare a site-specific health and safety plan (HASP).
2. HASP to include emergency response actions, PPE, and methods of decontamination.
3. Develop and implement the decontamination plan and operations to address both personnel and equipment.

Course Outcome(s):

Explain the basic elements of the incident command system, debriefing practices, post-incident analysis, and after-incident critique.

Essential Learning Outcome Mapping:

Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):

1. Recognize the elements of and functions within the Incident Command System.
2. Develop skills to participate in debriefing activities.
3. Conduct post-incident analysis for purposes of evaluating the root causes of the accident or incident.
4. Participate in a simulated after incident critique to acquire information from lessons learned during the hazardous chemical incident.

Methods of Evaluation:

1. In-class written exercises
2. In-class "hands-on" exercises/laboratory activities

3. Comprehensive written final examination
4. Quizzes and/or examinations

Course Content Outline:

1. Comprehensive overview of Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard (29 CFR1910.120) as is necessary to meet the Occupational Safety and Health Act (OSHA) 40 hour training requirements, to provide OSHA certificate of training to students who completed the course and satisfactorily demonstrate core competencies associated with the standard
   a. History of Hazardous Waste Operations and Emergency Response (HAZWOPER) standard
   b. Hierarchy and structure of managing hazardous environments
   c. OSHA - governmental agency structure and jurisdiction
2. Safety Principles and Job Hazard Analyses
   a. Introduction to safety concepts
   b. Analysis and review of the types of hazards associated with handling chemicals in the workplace or field
3. Site control
   a. Managing HAZWOPER operations or emergency response incident
   b. Introduction to the Incident Command System to understand chain of command; who is in charge of different components of an incident, and coordination of local and community resources
4. Training
   a. OSHA training requirements for personnel as embedded OSHA training modules
   b. OSHA requirements for different activities and events
5. Medical Surveillance Requirements
   a. How to monitor for exposure
   b. Medical considerations for different scenarios
6. Personal Protective Equipment (PPE)
   a. Different types of PPE as designed to address various level of chemical exposures (dermal, inhalation, ingestion)
   b. How to select appropriate PPE, how to effectively use different types of PPE and proper decontamination and proper disposal of PPE
7. Exposure Monitoring
   a. Ways to measure exposure to contaminants
   b. Basic understanding of exposure limits of each contaminant
8. Thermal Stress
   a. How to identify thermal stress
   b. Ways to alleviate thermal stress
9. Spill Containment Program
   a. Protocols on spill containment
   b. Equipment used in spill containment and response
10. Decontamination
    a. Processes of decontaminating personnel
    b. Methods of decontaminant equipment
    c. Decontamination procedures developed for specific hazards
11. Emergency Response Plan
    a. Recognition of associated hazards within the workplace that may result in exposure of workers and/or environment caused by an incident/release.
    b. Elements of an emergency response plan
    c. Implementation of the emergency response plan in a simulated scenario
12. Confined Spaces Programs
    a. Definition of confined space
    b. Hazard recognition associated with confined space
    c. Safety requirements for entry into confined spaces
13. Hot Work
    a. Identification types of hot work hazards
    b. Hot Work permits
14. Lockout/Tagout
    a. Forms of hazardous energy
    b. Requirements of a hazardous energy control program
    c. Identification elements of a lockout/tag out program
    d. Development and implementation of a lock/out tagout program

Resources

Hazardous Materials: Managing the Incident. *Noll, Gregory G. and Michael S. Hildebrand*. 5th. Burlington, MA: Jones & Bartlett Learning, 2022.

US Department of Transportation. *2020 Emergency Response Guidebook*. Washington: US Department of Transportation, 2020. https://www.phmsa.dot.gov/training/hazmat/erg/emergency-response-guidebook-erg

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Health and Human Services Department, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, Education and Information Division. *NIOSH Pocket Guide to Chemical Hazards*. NIOSH Publication No. 94-116, U.S. Government Printing Office, 2020. https://www.cdc.gov/niosh/npg/default.html

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Resources Other

1. United States Environmental Protection Agency Web Page, www.epa.gov
2. Occupational Safety and Health Administration Web Page, www.osha.gov
3. HazTrain"s Hazardous Waste Operations and Emergency Response Manual (2012) https://ertpvu.org/course_materials/classroom_course_materials/39/ERTP%20HAZWOPER%2040%20Hr%20manual.pdf
4. US Department of Labor - IUOE Training Material (2005) https://www.osha.gov/dte/grant_materials/fy05/46c5-ht16.html
5. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985) https://www.osha.gov/sites/default/files/publications/all-in-one.pdf

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