

# ATLB-2190: HAZWOPER

## Cuyahoga Community College

**Viewing: ATLB-2190 : Hazwoper**

**Board of Trustees:**

2018-01-25

**Academic Term:**

Summer 2019

**Subject Code**

ATLB - AIT-Construct/Hazard Material

**Course Number:**

2190

**Title:**

Hazwoper

**Catalog Description:**

Certification course covering health and safety hazards related to the abatement of hazardous materials on worksites. In addition, remediation and removal procedures will be covered and the safety standards protecting the public safety and abatement worker will be covered.

**Credit Hour(s):**

2

**Lecture Hour(s):**

2

### Requisites

**Prerequisite and Corequisite**

Departmental approval: admission to Laborer's apprenticeship program.

### Outcomes

**Course Outcome(s):**

Discuss the general hazard categories on a waste site and explain the respective labeling systems and identify the health hazards related to working with hazardous waste.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Explain the worker rights and responsibilities while performing work in a hazardous waste abatement environment.
2. Discuss worker reporting procedures with respect to hazardous conditions and violations while performing work on hazardous waste sites.
3. List and describe the four different types of chemical hazards.
4. Identify different types of radiation and discuss the sources and effects of each.
5. Describe the various labelling systems.
6. Describe the various labelling systems with respect to differences and similarities.
7. Explain how hazardous waste chemicals are tracked from removal to disposal.
8. Identify the health hazards related to working with hazardous materials.
9. Identify the routes of entry of contaminants into the body and explain the potential effects of each.

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**Course Outcome(s):**

Discuss the personal protective equipment (PPE) required for work on hazardous waste remediation including respiratory protection and decontamination sequences.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. List and define the terms related to worker protection and hazardous waste abatement.
  2. List and describe the different respirators and the respective limitations of each with respect to filter ratings.
  3. Discuss conditions causing respirator failure and identify the warning properties and procedures to be followed when breakthrough occurs.
  4. Differentiate between the various types of respirators and the delivery systems and operation of each.
  5. Explain the requirements of a respiratory protection program and differentiate between qualitative and quantitative fit tests.
  6. Demonstrate the ability to properly don, doff and maintain a respirator and identify potential PPE failures that may occur when working on remediation jobsites.
  7. Differentiate between hazardous waste remediation and worker and equipment decontamination.
  8. Explain the purpose of decontamination on hazardous waste sites, identify the various PPE levels and discuss decontamination procedures for each.
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**Course Outcome(s):**

Discuss specific emergency hazardous waste site situations, describe proper hazardous waste material handling and sampling techniques and procedures for workplace monitoring.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Describe hazardous waste site specific situations and describe different types of jobsite emergencies involving hazardous waste.
  2. List and explain topics with respect to site safety including emergency evacuation planning.
  3. Differentiate between jobsite emergencies covering waste related and non-waste related situations.
  4. Identify hazardous waste material on jobsites that affect worker safety.
  5. Characterize hazardous waste material with respect to hazard type including radio activity, explosiveness and leaking/open or defective containers.
  6. Analyze hazardous waste material and code with respect to pyrophoric, oxidation and shock sensitive characteristics.
  7. Demonstrate the ability to transfer hazardous waste from the jobsite in accord with weight classification, height restrictions and the Department of Transportation (DOT) requirements for visual identification and packaging.
  8. Describe the purpose of workplace monitoring and explain and compare the differences with respect to direct reading instruments (DRI's) versus laboratory analysis.
  9. Identify the various personal monitoring devices and demonstrate the ability to conduct monitoring on hazardous waste sites and in confined spaces.
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**Course Outcome(s):**

Identify the legal rights entitled to the hazardous waste worker under 29 CFR 1919.120 Hazwoper Standard and discuss the importance of transparent community relations with respect to abatement procedures.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Explain the worker rights and responsibilities while performing work in a hazardous waste abatement environment.
  2. Discuss worker reporting procedures with respect to hazardous conditions and violations while performing work on hazardous waste sites.
  3. Discuss the scope of work, including material handling, personal protective equipment (PPE) and clean-up procedures as outlined in the Hazwoper Standard 29 CFR 1910.120.
  4. Identify the classifications of the Hazwoper Standard.
  5. Discuss the importance of transparent community relations prior to and during hazardous waste abatement and explain the role of the worker in maintaining community relations during remediation and/or removal processes.
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**Methods of Evaluation:**

1. Quizzes
2. Tests
3. Class participation

**Course Content Outline:**

1. General hazards, labeling and health effects
  - a. General categories
    - i. Physical
    - ii. Chemical
    - iii. Biological
    - iv. Recognition
      1. Senses
      2. Monitoring
      3. Site characterization
  - b. Terms
    - i. Site characterization
    - ii. Hazardous waste
    - iii. Toxic chemical
    - iv. Corrosives
    - v. Reactive
    - vi. Immediate Danger of Life and Health IDHL
    - vii. Endothermic
    - viii. Exothermic
    - ix. Compatible/incompatible
    - x. Periodic table
  - c. Chemical hazard
    - i. Toxic
    - ii. Corrosive
    - iii. Carcinogen
    - iv. Reactive
  - d. Radiation
    - i. Ionizing
    - ii. Non-ionizing
    - iii. Sources
      1. Periodic table
      2. Natural
      3. Isotopes
      4. Man-made
    - iv. Effects
      1. Genetic changes
      2. Human
  - e. General labeling system
    - i. Purpose
      1. Chemical name
      2. Handling
      3. Health effects
      4. Clean-up
      5. Personal Protective Equipment PPE
    - ii. Types
      1. Department of Transportation DOT
      2. National Fire Protection Associate NFPA
      3. Global Harmonization System GHS
      4. Differences
        - a. Federal vs State
        - b. Symbols
        - c. Shipping tracking
      5. Similarities

- a. Identification
- b. Handling
- c. Chemical hazards
- d. Clean-up
- 6. Tracking
  - a. Identification numbers
  - b. Resource Conservation and Recovery Act RCRA
  - c. Waste origin
  - d. Disposal destination
- 7. Health hazards
  - a. Respiratory
  - b. Toxins
  - c. Skin absorption
  - d. Puncture
  - e. Reproductive
- 8. Routes of entry
  - a. Inhalation
  - b. Ingestion
  - c. Absorption
  - d. Puncture

2. PPE

- a. Terminology
  - i. Respirator
  - ii. Remediation
  - iii. National Institute of Occupational Safety and Health (NIOSH)
  - iv. American Conference of Governmental Industrial Hygiene (ACGIH)
  - v. Cartridge
  - vi. End of Service Life Indicator (ESLI)
  - vii. Breakthrough
  - viii. Warning properties
    - ix. Respiratory protection program
    - x. Pulmonary function test
    - xi. Qualitative
    - xii. Quantitative
  - xiii. Donning
  - xiv. Doffing
  - xv. Levels of protection
- b. Respirators
  - i. Types
    - 1. Half face
    - 2. Full face
    - 3. Powered air purifier respirator
    - 4. Supplied air
    - 5. Self-contained breathing apparatus
  - ii. Limitations
    - 1. Cartridge life
    - 2. Leakage
    - 3. Fogging
    - 4. Battery life
  - iii. Filter ratings
    - 1. N-Series
    - 2. P-Series
    - 3. R-Series
- c. Respirator failure
  - i. Causes
    - 1. Seal leaks
    - 2. Hose entanglement
    - 3. Carbon monoxide
  - ii. Warnings

1. Smell
2. Taste
- iii. Failure procedures
  1. Worker communication
  2. Exit
  3. Decontamination unit
- d. Respirator differences
  - i. Positive pressure
  - ii. Supplied air
  - iii. Demand
  - iv. Delivery
    1. Cascade system
    2. Air tank
  - v. Operation
    1. Positive
    2. Demand
- e. Fit test
  - i. Qualitative
    1. Regents
      - a. Sacrin
      - b. Banana oil
      - c. Bitrix
      - d. Irritant smoke
    2. Failure
      - a. Incorrect size
      - b. Facial hair
      - c. Olfactory fatigue
  - ii. Quantitative
    1. Machine
    2. Pass/fail
    3. Fit factor
  - iii. Respirator usage
    1. Don/doff
    2. Maintenance
      - a. Cleaning
      - b. Storage
    3. Potential failures
      - a. Penetrations
      - b. Permeation
      - c. Degradation
    4. Hazardous waste site
      - a. Landfill
      - b. Industrial plants
      - c. Refineries
      - d. Emergencies
        - i. Roadway
        - ii. Commercial
        - iii. Residential
    5. Remediation
      - a. Isolation
      - b. Material substitution
      - c. Engineered controls
      - d. Administrative
      - e. PPE
    6. Decontamination
      - a. Contamination avoidance
      - b. Level A

- i. Gross removal
      - ii. PPE removal
      - iii. Shower
    - c. Level B
      - i. Level A procedures
      - ii. Skin protection
    - d. Level C
      - i. Level A procedures
      - ii. Level B procedures
      - iii. Respirator
    - e. Level D
  - 7. Purpose
    - a. Worker safety
    - b. Job safety
    - c. Environmental
- 3. Emergencies, material handling and monitoring
  - a. Emergency types
    - i. Waste related
      - 1. Fire
      - 2. Spills
      - 3. Environmental contamination
        - a. Water
        - b. Air
        - c. Soil
        - d. Cross contamination
    - ii. Non-waste related
      - 1. Slips
      - 2. Trips
      - 3. Falls
      - 4. Equipment failure
  - b. Site safety topics
    - i. Site specific
    - ii. Fire brigade
    - iii. Response team
    - iv. Triosh
    - v. Emergency planning
      - 1. Evacuation procedures
      - 2. Team insertion and extraction
      - 3. Life flight
      - 4. Routing
  - c. Jobsite emergencies
    - i. Site related
    - ii. Environmental
    - iii. Occupational hazards
  - d. Hazardous waste materials
    - i. Petroleum
    - ii. Radio active
    - iii. Polychlorinated biphenyls
    - iv. Asbestos
    - v. Lead
    - vi. Organic matter
    - vii. Bi-hazards
    - viii. Combination
  - e. Material characterization
    - i. Radioactive
      - 1. Nuclear plants
      - 2. Chemical
      - 3. Hospital waste
    - ii. Explosives

1. Gases
  2. Vapors
  3. Fumes
  4. Dust
  5. Mist
- f. Material analysis coding
- i. Pyrophoric
    1. Material flash points
    2. Oils
    3. Chemicals
    4. Metals
  - ii. Oxidizers
    1. Sodium
    2. Chlorine
    3. Combination gases
  - iii. Shock sensitive
    1. Nitro glycerin
    2. Gun powder
    3. Dynamite
    4. Acetylene
    5. Ammonium nitrate
- g. Hazardous waste transportation
- i. Classifications
    1. Explosive
    2. Corrosive
    3. Flammable
  - ii. Height restrictions
    1. Weight
    2. Tipping
  - iii. DOT
    1. Visual
    2. Transport
    3. State regulations
    4. Administrative codes
- h. Workplace monitoring
- i. Purpose
    1. Worker safety
    2. Hazard identification
    3. Engineered control evacuation
    4. Risk reduction
  - ii. DRI"s
    1. Site specific
    2. Material classification
  - iii. Lab analysis
    1. Photo ionization instrument
    2. Personal air monitor
    3. Flame ionization
    4. Confined space air monitoring
4. Legal rights and community relations
- a. Workers rights
    - i. Training
      1. On site
      2. Classroom
    - ii. Site specific training
      1. Conditions
      2. Emergency procedures
      3. Hazards
        - a. Chemical
        - b. Physical

- iii. Training duration
- iv. Refresher requirements
- v. Complaint punishment
  - 1. 11-C protection
  - 2. Filing limitations
- vi. PPE
- vii. Hazardous material monitoring
- b. Worker responsibilities
  - i. Awareness
  - ii. Compliance
  - iii. Reporting
    - 1. Accidents
    - 2. Illness
    - 3. Hazardous conditions
      - a. Chemical
      - b. Physical

## Resources

W. David Yates. *Safety Professional's Reference*. Second Edition. CRC Press Custom Publishing/Boca Raton, Florida, 2015.

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Roger L. Brauer. *Safety and Health for Engineers*. 3rd Edition. Wiley Publishing/Hoboken, NJ, 2016.

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Rosalene E. Graham, Linda S. Rowley. *Occupational Safety and Health*. current. American Technical Publishers, Inc./Orland Parkway, 2014.

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## Resources Other

<https://www.blr.com/environmentaltips/Hazwoper>

[www.trconsultinggroup.com/safety/apr2002.htm](http://www.trconsultinggroup.com/safety/apr2002.htm)[https://www.osha.gov/dte/training\\_faqs.html](https://www.osha.gov/dte/training_faqs.html)

Top of page

Key: 436