FIRE 0642 - HAZARDOUS MATERIALS TECHNICIAN 1C, INCIDENT CONSIDERATIONS

Catalog Description

Prerequisite: Completion of FIRE 641 with grade of "C" or better or approved Federal/State equivalent course(s)
Hours: 40 (26 lecture, 14 laboratory)
Description: Hazardous materials on-scene incident considerations. Covers data research, meteorological considerations, protective actions, personal protective equipment, incident command aspects, site safety concepts, legislative and regulatory measures influencing emergency response and contingency planning. Meets standards prescribed by the CA State Fire Marshal and Office of Emergency Services. (not transferable) (not degree applicable) (pass/no pass grading)

Course Student Learning Outcomes

- CSLO #1: Compare and contrast various protective action measures associated with hazardous materials emergencies.
- CSLO #2: Explain risk considerations when selecting proper respiratory protection for various hazardous material emergencies.
- CSLO #3: Identify the differences in using ICS for a structure fire as compared to a hazardous materials emergency.
- CSLO #4: List the types of shipping papers and the location they can be found during transportation of hazardous materials.

Effective Term

Fall 2019

Course Type

Credit - Nondegree-applicable

Contact Hours

40

Outside of Class Hours

52

Total Student Learning Hours

92

Course Objectives

Lecture Objectives:
1. Evaluate general protective action concepts associated with hazardous materials response, with specific emphasis on evacuation and shelter-in-place options;
2. Assess the factors to be considered in selecting proper respiratory protection;
3. Describe the advantages, limitations, proper use and operational components of air purifying respirators at a hazardous materials incident;
4. Compare and contrast the four levels of chemical protection and match both the equipment required for each level and the conditions under which each level is used;
5. Recognize basic ICS concepts as they apply to hazardous materials incidents, the general organization of the Incident Command System and some of the standard ICS forms;
6. Analyze the types of shipping papers that may be found on rail cars, as well as the types of information they contain;
7. Identify how a liquid pipeline may carry different products, the types of information which may be found on a pipeline marker, basic guidelines to follow for mitigating pipeline incidents and some of the regulations pertaining to pipeline construction and safety;
8. Identify warning signs indicating the presence of a drug lab, as well as appropriate safety and tactical considerations to take at an incident scene;
9. Evaluate fire and safety protection systems that may be required at a fixed facility or bulk storage facility and how these systems affect the behavior of the products during an incident;
10. Recognize federal and state laws and regulations pertaining to hazardous materials and hazardous waste, as well as some of the key provisions of each;
11. Examine potential areas of liability in dealing with hazardous materials incidents, as well as guidelines that can be implemented both before and during an incident to minimize liability for response personnel;
12. Assess some of the key components of a hazardous materials area plan;
13. Identify components of the three phases of an effective incident termination: debriefing, post-incident analysis and critique; and
14. Examine regulations pertaining to air transport of hazardous materials and the types of shipping papers required.
Laboratory Objectives:
1. Compare the types of hazard and response information available from reference manuals, hazardous materials databases, technical information centers and technical information specialists, and explain the advantages and disadvantages of each resource;
2. Utilize various reference sources to identify hazard and response information about various hazardous materials;
3. Assess how various meteorological factors may influence a hazardous materials incident;
4. Evaluate the three types of vapor-protective, splash-protective and support-function clothing, and describe advantages and disadvantages of each;
5. Judge the significance of degradation, penetration and permeation as they relate to suit selection;
6. Compare intermodal tank containers including construction features, markings, general classes, fittings, and how to handle hazardous materials within them;
7. Investigate and evaluate the type of carrier and material most commonly involved in highway hazardous materials incidents;
8. Examine the types of information available from highway shipping papers;
9. Describe the types of information available from cargo tank markings and specification plates;
10. Compare the five types of cargo tanks, and identify the type(s) of products they are designed to transport;
11. Evaluate the features and various materials used in the construction of cargo tanks;
12. Diagram the fittings required to be attached to specification cargo tanks;
13. Identify some of the general types of transport vehicles used in rail transportation;
14. Compare and contrast various tank cars by type, capacity and contents they typically transport;
15. Diagram various tank car fittings that may be found on the different types of tank cars;

16. Evaluate the chemicals used in illegal drug manufacturing operations and the hazards associated with drub labs;
17. Examine basic design and construction features of storage tanks found at fixed facilities, the types of materials they may contain, and the types of damage that they might incur;
18. Identify the types of vessels that may be involved in maritime incidents and some of the hazards associated with them, as well as the types of shipping papers that will be carried on these vessels and the information they contain; and
19. Assess metals used in aircraft construction and the advantages and disadvantages of each, as well as the fuels and fluids generally found aboard aircraft and their associated hazards.

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

Methods of Evaluation

- Objective Examinations
  - Example: Students will take a multiple-choice examination on respiratory protection. Standard grading. Example Question: Which protection equipment would you use for a reconnaissance mission? A. Class 4 ensemble with air purifying respirator, B. EPA level B ensemble with supplied air, C. Structural Firefighting clothing with SCBA, D. Class 1 ensemble with SCBA.
- Reports
  - Example: In a report, describe the following types of tank cars used for rail transport of hazardous materials. Identify the types of materials they may carry: Non-pressure tank cars, Pressure tank cars, Cryogenic tank cars, high pressure tube cars. Rubric Grading.
- Skill Demonstrations
  - Example: Students will demonstrate how to properly don a Level-C Chemical Protective Clothing Ensemble. Grading based on industry standard.

Repeatable

No

Methods of Instruction

- Laboratory
- Lecture/Discussion

Lab:

1. The instructor will lead a discussion of safety requirements for fixed facilities. Students will then work in small groups using scenario information provided by the instructor and a site safety plan form to prepare a site safety plan.

Lecture:

1. After viewing the film on BLEVE's, the instructor will lecture and review various incidents where they have occurred and where and how they were avoided. Following the lecture, students will prepare a list of how BLEVE's can be avoided.

Typical Out of Class Assignments

Reading Assignments

1. Read the material in the text on rail shipping papers/hazard communication information and be be prepared to discuss in class how this may vary with other modes of transportation. 2. Prepare an agenda for a post incident analysis of an emergency involving a clandestine drug lab after reading the material on incident termination.

Writing, Problem Solving or Performance

1. Identify the materials contained in a railroad box car by reviewing the rail shipping papers and prepare a report. 2. What elements should be included in the procedures and protocol section of the emergency response plan? Why?

Other (Term projects, research papers, portfolios, etc.)

Required Materials

- Hazardous Materials Technician 1C, Incident Considerations
  - Author: State of California
  - Publisher: California Specialized Training Institute
  - Publication Date: 2003
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:
- Chemistry of Hazardous Materials
  - Author: Eugene Meyer
  - Publisher: Brady
  - Publication Date: 2010
  - Text Edition: 5th
  - Classic Textbook?:
  - OER Link:
  - OER:
- Hazardous Materials Managing the Incident
  - Author: Gregory G. Noll & Michael S. Hildebrand
  - Publisher: Jones and Bartlett Learning
  - Publication Date: 2014
  - Text Edition: 4th
  - Classic Textbook?:
  - OER Link:
  - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.