FIRE 0618 - FIRE CONTROL 4

Catalog Description

Prerequisite: Completion of Fire 100 and 170 with grades of "C" or better or equivalent as determined by the Program Coordinator.
Hours: 16 (8 lecture, 8 laboratory)
Description: This course provides the knowledge and skills that prepare a firefighter to extinguish an ignitable liquid fire, control a flammable gas fire, and develop an incident action plan for a pipeline emergency. (not transferable) (not degree applicable) (pass/no pass grading)

Course Student Learning Outcomes

- CSLO #1: Compare and contrast the properties and characteristics of flammable gases and liquids.
- CSLO #2: Outline tactics to use on a flammable gas leak and flammable liquid spill not involved with fire, and leaks of spills involved with fire.
- CSLO #3: Demonstrate proper techniques to extinguish flammable gas and liquid fires.

Effective Term

Fall 2019

Course Type

Credit - Nondegree-applicable

Contact Hours

16

Outside of Class Hours

16

Total Student Learning Hours

32

Course Objectives

Lecture Objectives:
1. Analyze methods by which foam prevents or controls a hazard
2. List principles by which foam is generated
3. Identify causes of poor foam generation and corrective measures
4. Describe the difference between hydrocarbon and polar solvent fuels and the concentrates that work on each
5. Identify the characteristics, uses, and limitations of firefighting foams
6. List the advantages and disadvantages of using fog nozzles versus foam nozzles for foam application
7. Describe foam stream application techniques
8. List hazards associated with foam use
9. Identify characteristics of pressurized flammable gases
10. List elements of a gas cylinder
11. Describe effects of heat and pressure on closed cylinders
12. Describe boiling liquid expanding vapor explosion (BLEVE) signs and effects
13. Identify methods for identifying contents
14. Describe how to identify escape routes and safety zones before approaching flammable gas cylinder fires
15. Describe water stream usage and demands for pressurized cylinder fires
16. Describe what to do if the fire is prematurely extinguished
17. Identify valve types and their operation
18. Discuss alternative actions related to various hazards and when to retreat
19. Describe how techniques used to control flammable gas fires in cylinders can apply to fire control in gas delivery and distribution systems
20. Describe basic types and categories of pipeline systems
21. Describe the primary federal agencies that regulate pipeline operations
22. Describe the primary state agencies that regulate pipeline operations
23. Identify the rules and regulations that govern the design, construction, operation, safety, and maintenance of interstate pipelines
24. Identify the primary causes of pipeline incidents
25. Identify the key players who may become involved in a major pipeline emergency and describe their role in resolving the emergency
26. Describe the pipeline transportation chain
27. Identify where pipelines are located within California
28. Identify different types of pipeline markers found along a pipeline corridor
29. Identify the following information on a pipeline marker:
30. Describe the purpose of pipeline rights-of-way
31. Identify clues that, in the absence of markers, may indicate the presence of an underground pipeline
32. Identify basic design and construction features of a pipeline system
33. Describe how different liquid pipeline products behave during an uncontrolled release
34. Identify indicators of a leaking liquid pipeline
35. Define “highly volatile liquid” (HVL) and identify common HVLs transported by pipelines
36. Describe danger areas of a liquefied petroleum gas (LPG) release
37. Identify operations of a gas pipeline
38. Describe how different gas pipeline products behave during an uncontrolled release
39. Identify indicators of a leaking natural gas pipeline
40. Describe general hazard and risk issues to evaluate when responding to a pipeline emergency
41. Describe key considerations to evaluate when developing an initial incident action plan
Laboratory Objectives:
1. Prepare foam concentrate supply for use
2. Assemble foam stream components
3. Demonstrate foam application techniques
4. Demonstrate approach and retreat from spills as part of a coordinated team
5. Execute effective advances and retreats for a flammable gas fire
6. Apply various water application techniques
7. Operate control valves

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

- Not Transferable

Methods of Evaluation

- Objective Examinations
  - Example: Students will take a multiple-choice examination on flammable liquid storage tank. Standard Grading. Example Question: To prevent explosions in possible overheating situations, propane tanks are equipped with: A. Relief Valves, B. Release Valves, C. Connection Valves, D. Vapor Space.
- Skill Demonstrations
  - Example: Given an instructor based scenario, students must demonstrate how to safely and properly extinguish a gas cylinder fire. Grading based on industry standard.

Repeatable

No

Methods of Instruction

- Laboratory
- Lecture/Discussion

Lab:

1. The instructor will lecture on correct suppression tactics for gas and liquid fires and the students will practice and demonstrate correct procedures.

Lecture:

1. The instructor will lead a discussion of sources of information on flammable and combustible gases and liquids. Students will then compare the DOT Emergency Response Guide, NFPA Hazardous Materials Handbook, and CHRIS manual.

Typical Out of Class Assignments
Reading Assignments

1. The student will read the material on BLEVE's and the Kingman, Arizona, incident. They will then create a list of warning signs that were ignored by the Kingman Fire Department. 2. The student will read the material on flammable and combustible liquids and will be prepared to discuss in class the difference of these liquids and give examples of each.

Writing, Problem Solving or Performance

1. Using a DOT Emergency Response Guide, determine the initial isolation/evacuation distances for the provided list of flammable liquids and gases. 2. Using the NFPA Hazardous Materials Handbook, determine the flammable range of the provided list of gases and liquids.

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

- Flammable Gas and Liquids Firefighting
  - Author: California State Fire Marshal
  - Publisher: State of California
  - Publication Date: 1996
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:
- Fire Dynamics
  - Author: Gregory E. Gorbett & James L. Pharr
  - Publisher: Brady
  - Publication Date: 2011
  - Text Edition:
  - Classic Textbook?:
  - OER Link:
  - OER:
- Fundamentals of Fire Fighter Skills
  - Author: International Association of Fire Chiefs & National Fire Protection Association
  - Publisher: Jones and Bartlett Learning
  - Publication Date: 2017
  - Text Edition: 3rd
  - Classic Textbook?:
  - OER Link:
  - OER:

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