



Western Technical College

10503193 Fire Protection Systems

Course Outcome Summary

Course Information

Description	This course provides information relating to the features of design and operation of fire alarm systems, water-based fire suppression systems, special hazard fire suppression systems, water supply for fire protection and portable fire extinguishers.
Career Cluster	Law, Public Safety, Corrections and Security
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	72

Pre/Corequisites

Pre/Corequisite 10503157 Fire Investigation

Textbooks

Fire Detection and Suppression Systems. 5th Edition. Copyright 2016. International Fire Service. Publisher: Fire Protection Publications/IFSTA. **ISBN-13:** 978-0-87939-599-5. Required.

Learner Supplies

Polo shirt with logo, black pants, black ankle supporting shoes/boots. **Vendor:** To be discussed in class. Required.

Success Abilities

1. Cultivate Passion: Expand a Growth-Mindset
2. Live Responsibly: Embrace Sustainability

3. Refine Professionalism: Improve Critical Thinking
4. Refine Professionalism: Practice Effective Communication

Program Outcomes

1. Demonstrate professional conduct by displaying personal code of ethics, positive work ethics, flexibility, teamwork skills, physical fitness, safe procedures, and sensitivity to diverse cultures and individuals
2. Perform fire prevention activities including preplanning, public education, inspection, and investigation
3. Apply incident management and mitigation skills to emergency incidents
4. Meet professional fire and EMS credentialing standards
5. Communicate clearly and effectively both verbally and through written documentation with clients, coworkers, other agencies, and supervisors
6. Apply critical thinking skills to both emergency and non-emergency situations

Course Competencies

1. Identify various types and uses of fire protection systems.

Assessment Strategies

- 1.1. Written Objective Test
- 1.2. Project

Criteria

- 1.1. Score a minimum of 70%.
- 1.2. Complete exam within 90 minutes.
- 1.3. Complete exam without using any reference books or notes.
- 1.4. Complete exam at prescribed time and place.
- 1.5. Project includes all required areas.
- 1.6. Project presentation is at least 10 minutes long.
- 1.7. Project is presented professionally.
- 1.8. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 1.a. Define the terms Fire Detection System and Fire Suppression System.
- 1.b. Summarize the historical development of detection and suppression systems.
- 1.c. Describe the various types of commonly used detection and suppression systems.

2. Examine the basic elements of a public water supply system as it relates to fire protection.

Assessment Strategies

- 2.1. Written Objective Test
- 2.2. Project

Criteria

Performance will be satisfactory when:

- 2.1. Score a minimum of 70%.
- 2.2. Complete exam within 90 minutes.
- 2.3. Complete exam without using any reference books or notes.
- 2.4. Complete exam at prescribed time and place.
- 2.5. Project covers all required areas.
- 2.6. Project presentation is at least 10 minutes long.
- 2.7. Project presentation is presented professionally.
- 2.8. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 2.a. Discuss the basic components of a public water supply system.

- 2.b. Discuss private water supply systems.
- 2.c. Summarize variables that affect the piping distribution system.
- 2.d. Understand the role of the Insurance Service Office relating to water supply.

3. Explain the benefits of fire protection systems in various types of structures.

Assessment Strategies

- 3.1. Written Objective Test
- 3.2. Project

Criteria

- 3.1. Perform as a team member to safely and effectively.
- 3.2. Score a minimum of 70%.
- 3.3. Complete exam within 90 minutes.
- 3.4. Complete exam without using any reference books or notes.
- 3.5. Complete exam at prescribed time and place.
- 3.6. Project covers all required areas.
- 3.7. Project presentation is at least 10 minutes long.
- 3.8. Project is prepared and presented professionally.
- 3.9. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 3.a. Describe the role and benefits of residential and commercial detection and suppression systems in protecting life and property.
- 3.b. Summarize the role of codes and standards in the design, installation and maintenance of detection and suppression systems.
- 3.c. Summarize the impact of fire detection and suppression systems on firefighters safety and fire suppression operations.

4. Examine the basic elements of a public water supply system including sources, distribution networks, piping and hydrants.

Assessment Strategies

- 4.1. Written Objective Test
- 4.2. Project

Criteria

Performance will be satisfactory when:

- 4.1. Perform as a team member to safely and effectively.
- 4.2. Score a minimum of 70%.
- 4.3. Complete exam within 90 minutes.
- 4.4. Complete exam without using any reference books or notes.
- 4.5. Complete exam at prescribed time and place.
- 4.6. Project covers all required areas.
- 4.7. Project presentation is at least 10 minutes long.
- 4.8. Project is prepared and presented professionally.
- 4.9. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 4.a. Distinguish among valves used on water distribution systems.
- 4.b. Discuss types of hydrants and their maintenance and testing.
- 4.c. Describe how fire hydrants are located and distributed according to model fire codes.

5. Explain why water is a commonly used extinguishing agent.

Assessment Strategies

- 5.1. Written Objective Test
- 5.2. Project

Criteria

- 5.1. Perform as a team member to safely and effectively.
- 5.2. Score a minimum of 70%.
- 5.3. Complete exam within 90 minutes.
- 5.4. Complete exam without using any reference books or notes.

- 5.5. Complete exam at prescribed time and place.
- 5.6. Project covers all required areas.
- 5.7. Project presentation is at least 10 minutes long.
- 5.8. Project is prepared and presented professionally.
- 5.9. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 5.a. Examine the chemical and physical properties of water.
- 5.b. Explain the extinguishing properties of water.
- 5.c. Describe the advantages and disadvantages of using water as an extinguishing agent.

6. Identify the different types and components of sprinkler, standpipe and foam systems.

Assessment Strategies

- 6.1. Written Objective Test
- 6.2. Project

Criteria

- 6.1. Perform as a team member to safely and effectively.
- 6.2. Score a minimum of 70%.
- 6.3. Complete exam within 90 minutes.
- 6.4. Complete exam without using any reference books or notes.
- 6.5. Complete exam at prescribed time and place.
- 6.6. Project covers all required areas.
- 6.7. Project presentation is at least 10 minutes long.
- 6.8. Project is prepared and presented professionally.
- 6.9. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 6.a. Describe components of an automatic sprinkler system.
- 6.b. discuss temperature ratings, response times and deflector components of sprinklers.
- 6.c. describe types of specialty sprinklers.
- 6.d. Discuss wet pipe and dry pie sprinkler systems.
- 6.e. Describe deluge and pre-action systems.
- 6.f. Discuss sprinkler systems in storage facilities.
- 6.g. summarize testing and maintenance considerations.

7. Critique current residential and commercial sprinkler legislation.

Assessment Strategies

- 7.1. Written Objective Test
- 7.2. Presentation

Criteria

- 7.1. Perform as a team member to safely and effectively.
- 7.2. Score a minimum of 70%.
- 7.3. Complete exam within 90 minutes.
- 7.4. Complete exam without using any reference books or notes.
- 7.5. Complete exam at prescribed time and place.
- 7.6. Project covers all required areas.
- 7.7. Project presentation is at least 10 minutes long.
- 7.8. Project is prepared and presented professionally.
- 7.9. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 7.a. Discuss NFPA 13, 13D and 13R.
- 7.b. Discuss the benefits of an automatic sprinkler system.
- 7.c. Discuss residential sprinkler systems.

8. Identify the different types of non-water based fire suppression systems.

Assessment Strategies

- 8.1. Written Objective Test
- 8.2. Project

Criteria

- 8.1. Perform as a team member to safely and effectively.
- 8.2. Score a minimum of 70%.
- 8.3. Complete exam within 90 minutes.
- 8.4. Complete exam without using any reference books or notes.
- 8.5. Complete exam at prescribed time and place.
- 8.6. Project covers all required areas.
- 8.7. Project presentation is at least 10 minutes long.
- 8.8. Project is prepared and presented professionally.
- 8.9. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 8.a. Describe special extinguishing system classifications.
- 8.b. Discuss wet chemical fire extinguishing systems.
- 8.c. Discuss dry chemical fire extinguishing systems.
- 8.d. Discuss clean agent fire extinguishing systems.
- 8.e. Discuss carbon dioxide fire extinguishing systems.

9. Explain the basic components of a fire alarm system.

Assessment Strategies

- 9.1. Written Objective Test
- 9.2. Project

Criteria

- 9.1. Perform as a team member to safely and effectively.
- 9.2. Score a minimum of 70%.
- 9.3. Complete exam within 90 minutes.
- 9.4. Complete exam without using any reference books or notes.
- 9.5. Complete exam at prescribed time and place.
- 9.6. Project covers all required areas.
- 9.7. Project presentation is at least 10 minutes long.
- 9.8. Project is prepared and presented professionally.
- 9.9. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 9.a. Identify the components of a fire detection and alarm system.
- 9.b. Analyze factors that affect signaling system requirements and types of specialty signals.
- 9.c. Explain protected premises alarm systems.
- 9.d. Contrast types of supervising station alarm systems.
- 9.e. Identify types of emergency communication systems.
- 9.f. Summarize testing of fire detection and alarm systems.

10. Explain how the different types of detectors detect fire.

Assessment Strategies

- 10.1. Written Objective Test
- 10.2. Project

Criteria

Performance will be satisfactory when:

- 10.1. Perform as a team member to safely and effectively.
- 10.2. Score a minimum of 70%.
- 10.3. Complete exam within 90 minutes.
- 10.4. Complete exam without using any reference books or notes.
- 10.5. Complete exam at prescribed time and place.
- 10.6. Project covers all required areas.
- 10.7. Project presentation is at least 10 minutes long.
- 10.8. Project is prepared and presented professionally.
- 10.9. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 10.a. Identify types of initiating devices.
- 10.b. Identify types of fixed temperature heat detectors.
- 10.c. Identify types of rate of rise heat detectors.
- 10.d. Distinguish among types of smoke detectors.
- 10.e. Distinguish among types of flame, fire gas and other detection devices.

11. Identify the four factors that can influence smoke movement in a building.

Assessment Strategies

- 11.1. Written Objective Test
- 11.2. Project

Criteria

Performance will be satisfactory when:

- 11.1. Perform as a team member to safely and effectively.
- 11.2. Score a minimum of 70%.
- 11.3. Complete exam within 90 minutes.
- 11.4. Complete exam without using any reference books or notes.
- 11.5. Complete exam at prescribed time and place.
- 11.6. Project covers all required areas.
- 11.7. Project presentation is at least 10 minutes long.
- 11.8. Project is prepared and presented professionally.
- 11.9. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 11.a. Summarize factors that affect smoke generation and spread.
- 11.b. Describe the hazards associated with smoke and other products of combustion.
- 11.c. Explain the purpose of a smoke management system.
- 11.d. discuss the history of smoke management systems.
- 11.e. Describe strategies and types of smoke management methods used in buildings.

12. Identify the appropriate application of fire protection systems.

Assessment Strategies

- 12.1. Written Objective Test
- 12.2. Project

Criteria

Performance will be satisfactory when:

- 12.1. Perform as a team member to safely and effectively.
- 12.2. Score a minimum of 70%.
- 12.3. Complete exam within 90 minutes.
- 12.4. Complete exam without using any reference books or notes.
- 12.5. Complete exam at prescribed time and place.
- 12.6. Project covers all required areas.
- 12.7. Project presentation is at least 10 minutes long.
- 12.8. Project is prepared and presented professionally.
- 12.9. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 12.a. Discuss various types of fire protections systems.
- 12.b. Explain the advantages and disadvantages of various fire protection systems.
- 12.c. Describe considerations when selecting fire protections systems.

13. Explain the operation and appropriate application for the different types of portable fire protection systems.

Assessment Strategies

- 13.1. Written Objective Test
- 13.2. Project

Criteria

Performance will be satisfactory when:

- 13.1. Perform as a team member to safely and effectively.
- 13.2. Score a minimum of 70%.
- 13.3. Complete exam within 90 minutes.
- 13.4. Complete exam without using any reference books or notes.
- 13.5. Complete exam at prescribed time and place.
- 13.6. Project covers all required areas.
- 13.7. Project presentation is at least 10 minutes long.
- 13.8. Project is prepared and presented professionally.
- 13.9. Project presentation uses multiple mediums. i.e. photos, graphics, videos, handouts etc.

Learning Objectives

- 13.a. Identify classifications of portable fire extinguishers.
- 13.b. Describe the method by which portable extinguishers are rated.
- 13.c. Identify the types of agents used in portable fire extinguishers.
- 13.d. Describe the operating principles of portable fire extinguishers.
- 13.e. Discuss inspection, testing and maintenance requirements for portable fire extinguishers.
- 13.f. Summarize considerations for selection, distribution, installation and placement of extinguishers.