Course Outline for Fire Technology 5

FIRE PROTECTION SYSTEMS

Catalog Description:

FT 5 - Fire Protection Systems 3.00 units
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. This course is intended for students majoring in Fire Technology and Fire Prevention Inspector, or anyone interested in fire protection. (May not receive credit if Fire Tech 55 has been completed.)

Advisory: Eligibility for ENGL 1A

Strongly Recommended: FT 1 (completed with a grade of "C" or higher) or, FT 50 (completed with a grade of "C" or higher)

Grading Option: Letter Grade

Discipline:

<table>
<thead>
<tr>
<th>Units</th>
<th>Contact Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Week</td>
</tr>
<tr>
<td>Lecture</td>
<td>3.00</td>
</tr>
<tr>
<td>Laboratory</td>
<td>0.00</td>
</tr>
<tr>
<td>Clinical</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>3.00</td>
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Prerequisite Skills:
None

Measurable Objectives:

Upon completion of this course, the student should be able to:
1. Identify and describe various types and uses of fire protection systems;
2. Describe the basic elements of a public water supply system as it relates to fire protection;
3. Explain the benefits of fire protection systems in various types of structures;
4. Describe the basic elements of a public water supply system including sources, distribution networks, piping, and hydrants;
5. Explain why water is a commonly used extinguishing agent;
6. Identify the different types and components of sprinkler, standpipe and foam systems;
7. Review residential and commercial sprinkler legislation;
8. Identify the different types of non-water based fire suppression systems;
9. Explain the basic components of a fire alarm system;
10. Identify the different types of detectors and explain how they detect fire;
11. Describe the hazards of smoke and list the four factors that can influence smoke movement in a building;
12. Discuss the appropriate application of fire protection systems;
13. Explain the operation and appropriate application for the different types of portable fire protection systems.

Course Content:

1. Introduction to fire protection systems
   A. The role fire protection systems play in protecting the life, safety, and welfare of the general public and firefighters
   B. Overview of the different types of fire protection systems
   C. The role of codes & standards in fire protection system design
2. Water supply systems for fire protection systems
   A. Sources of fire protection water supply
   B. Distribution networks
   C. Piping
   D. Hydrants
   E. Utility company interface with the fire department
3. Water-based fire suppression systems
   A. Properties of water
      a. Water as an effective extinguishing agent
      b. How water extinguishes fire
   B. Sprinkler systems
      a. Types of systems & applications
      b. Types of sprinklers & applications
      c. Piping, valves, hangers & alarm devices
      d. Fire department operations in buildings with sprinkler systems
   C. Residential sprinkler systems
   D. Standpipe systems
      a. Types & applications
      b. Fire department operations in buildings with standpipes
   E. Foam systems
   F. Water mist systems
G. Fire pumps
   a. Types
   b. Components
   c. Operation
   d. Fire pump curves
4. Non-water-based fire suppression systems
   A. Carbon dioxide systems
      a. Applications
      b. Extinguishing properties
      c. System components
   B. Halogenated systems
      a. Halon 1301 and the environment
      b. Halon alternatives
      c. Extinguishing properties
      d. System components
   C. Dry/wet chemical extinguishing systems
      a. Extinguishing properties
      b. Applications
      c. UL 300
5. Fire alarm systems
   A. Components
   B. Types of fire alarm systems
   C. Detectors
      a. Smoke
      b. Heat
      c. Flame
   D. Audible/visual devices
   E. Alarm monitoring
   F. Testing & maintenance of fire alarm systems
6. Smoke management systems
   A. Hazards of smoke
   B. Smoke movement in buildings
   C. Types of smoke management systems
   D. Firefighter operations in buildings with smoke management systems
7. Portable fire extinguishers
   A. Types & applications
   B. Selection
   C. Placement
   D. Maintenance
   E. Portable fire extinguisher operations

Methods of Presentation
1. Lecture/Discussion
2. Presentation of audio-visual materials
3. Hands-on Activities
4. Group Activities
5. Case Study
6. Field Trips

Assignments and Methods of Evaluating Student Progress
1. Typical Assignments
   A. List a type, component, and operation of a specific sprinkler system.
   B. Select the appropriate type of portable fire extinguisher for a given classification of fire.
   C. Identify the components of a standpipe system and describe the purpose of each part.
   D. Write a term paper on one of the following fire protection system issues 1) Explain the history of the international building or fire code, its related standards, and how the international code applies to you as a fire inspector 2) Explain the different types of alarm control devices and systems.
2. Methods of Evaluating Student Progress
   A. Exams/Tests
   B. Quizzes
   C. Papers
   D. Class Participation
   E. Computational and writing assignments
   F. Research Projects
   G. Fieldwork in fire prevention inspections
   H. Midterm Examination
   I. Final Examination

3. Student Learning Outcomes
   Upon the completion of this course, the student should be able to:
   A. Given applicable NFPA Standards, the California Fire Code, The California Building Code, applicable reference material, a campus map, measuring wheels, preplan form, graph paper, engineers scale and fire department access exercise:
      Demonstrate knowledge of both proper and improper placement of fire appurtenances, identify proper proximity to buildings, and identify fire protection systems for specific occupancies. Analyze the efficiency of specific layouts.
   B. Given field trips to 1.A hazardous facility with multiple fire protection items/ systems and 2.A fire protection training facility:
      Identify the different systems, their applications and possible malfunctions due to lack of compatibility, misuse or incorrect installation.
   C. Given the applicable NFPA Standards, California Building Code, California Fire Code, and related reference material and commentary, lecture, videos and class discussion: Identify various fire protection systems, their applications and functions, components, testing requirements, and hazards of incompatibility and improper placement.

Textbooks (Typical):

Special Student Materials
1. Student Architecture 12" Triangular Scale
2. Student Engineering 12" Triangular Scale
3. Mechanical Pencil, #2
4. Graph paper

**Abbreviated Class Schedule Description:**

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