COURSE INFORMATION FORM

DISCIPLINE: Fire Science
COURSE TITLE: Fire Protection Systems
CR.HR: 3
LECT HR. _______ LAB HR. _______ CLIN/INTERN HR. _______ CLOCK HR. _______

CATALOG 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.

PREREQUISITES

None

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)

Upon completion of this course, the student will be able to:

1. Explain the benefits of fire protection systems in various types of structures.
2. Describe the basic elements of a public water supply system including sources, distribution networks, piping and hydrants.
3. Explain why water is a commonly used extinguishing agent.
4. Identify the different types and components of sprinkler, standpipe and foam systems.
5. Review residential and commercial sprinkler legislation.
6. Identify the different types of non-water based fire suppression systems.
7. Explain the basic components of a fire alarm system.
8. Identify the different types of detectors and explain how they detect fire.
9. Describe the hazards of smoke and list the four factors that can influence smoke movement in a building.
10. Discuss the appropriate application of fire protection systems.
11. Explain the operation and appropriate application for the different types of portable fire protection systems.
GENERAL EDUCATION OUTCOMES (ESO)
Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

3 Lifetime Learning

B. Personal and Professional Development
   • Pursue structured learning opportunities, certification, and/or degrees (1-11)

C. Attributes of an Awareness of the Convergence of Knowledge
   • Synthesize information to facilitate application (1-8)
PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

The student will be able to explain and demonstrate the ability to Investigate a fire scene as to its cause and origin

- Recognize the responsibilities of the firefighter and fire department as it relates to fire investigations
- Recognize the laws, statutes’, case studies and standards (NFPA 921) that apply to fire investigations
- Demonstrate the ability to evidence preservation on collection related to fire investigations

The student will be able to explain and demonstrate the ability to conduct, fire inspection and public relation events and demonstrate the use and explain the requirement standards for residential and commercial sprinkler and detection systems

- Recognize the fire codes, elements and procedures relating to fire inspections
- Demonstrate the ability to prepare a residential and commercial pre-incident survey
- Demonstrate the ability to present fire safety lectures and educational classes for adults and children
- Recognize the elements and parts of a fire sprinkler and detection system

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes will be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

All of the expected student outcomes will be measured by a series of written assessments and online discussions.
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. 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

II. 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

III. Water-based fire suppression systems
   A. Properties of water
      1. Water as an effective extinguishing agent
      2. How water extinguishes fire
   B. Sprinkler Systems
      1. Types of systems & applications
      2. Types of sprinklers & applications
      3. Piping, valves, hangers & alarm devices
      4. Fire department operations in buildings with sprinkler systems
   C. Residential sprinkler systems
   D. Standpipe systems
      1. Types & applications
      2. Fire department operations in buildings with standpipes
   E. Foam systems
   F. Water mist systems
   G. Fire pumps
      1. Types
      2. Components
      3. Operation
      4. Fire pump curves

IV. Non-water-based fire suppression systems
   A. Carbon dioxide systems
      1. Applications
2. Extinguishing properties
3. System components
B. Halogenated systems
   1. Halon 1301 and the environment
   2. Halon alternatives
   3. Extinguishing properties
   4. System components
C. Dry/Wet Chemical Extinguishing systems
   1. Extinguishing properties
   2. Applications
   3. UL 300

V. Fire alarm systems
   A. Components
   B. Types of fire alarm systems
   C. Detectors
      1. Smoke
      2. Heat
      3. Flame
   D. Audible/visual devices
   E. Alarm monitoring
   F. Testing & maintenance of fire alarm systems

VI. 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

VII. Portable fire extinguishers
   A. Types & applications
   B. Selection
   C. Placement
   D. Maintenance

E. Portable fire extinguisher operations