

**J. Sargeant Reynolds Community College
Course Content Summary**

Course Prefix and Number: FST 215 **Credits:** 3

Course Title: Fire Protection Systems

Course Description:

Provides information relating to the features of design and operation of fire detection and alarm systems, heat and smoke control systems, special protection and sprinkler systems, water supply for fire protection, and portable fire extinguishers. Lecture 3 hours per week.

General Course Purpose:

Provides students with an understanding of the operation and design of fire protection systems.

Course Prerequisites and Co-requisites:

None

Student Learning Outcomes:

Upon completion of this course, you will be able to:

- Identify the different types, uses and benefits of fire protection systems found in various types of structures;
- Summarize the basic elements of a public water supply system as it relates to fire protection systems;
- Explain the operation and appropriate application for the different types of portable fire protection systems;
- Identify the different types and components of sprinkler, standpipe and foam systems;
- Discuss residential and commercial sprinkler legislation;
- Compare the basic components and detectors in a fire alarm system;
- Describe the hazards of smoke, and list the 4 factors that can influence smoke movement in a building.

Major Topics to Be Included:

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 and 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
 - i. Water as an Effective Extinguishing Agent
 - ii. How Water Extinguishes Fire
 - b. Sprinkler Systems
 - i. Types of Systems and Applications
 - ii. Types of Sprinklers and Applications
 - iii. Piping, Valves, Hangers and Alarm Devices
 - iv. Fire Department Operations in Buildings with Sprinkler Systems
 - c. Residential Sprinkler Systems
 - d. Standpipe Systems
 - i. Types and Applications
 - ii. Fire Department Operations in Buildings with Standpipes
 - e. Foam Systems
 - f. Water Mist Systems
 - g. Fire Pumps
 - i. Types
 - ii. Components
 - iii. Operation
 - iv. Fire Pump Curves
4. Non-Water-Based Fire Suppression Systems
 - a. Carbon Dioxide Systems
 - i. Applications
 - ii. Extinguishing Properties
 - iii. System Components
 - b. Halogenated Systems
 - i. Halon 1301 and the Environment
 - ii. Halon Alternatives
 - iii. Extinguishing Properties
 - iv. System Components
 - c. Dry/Wet Chemical Extinguishing Systems
 - i. Extinguishing Properties
 - ii. Applications
 - iii. UL 300
5. Fire Alarm Systems
 - a. Components
 - b. Types of Fire Alarm Systems
 - c. Detectors
 - i. Smoke
 - ii. Heat
 - iii. Flame
 - d. Audible/Visual Devices
 - e. Alarm Monitoring
 - f. Testing and 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 and Applications

- b. Selection
- c. Placement
- d. Maintenance
- e. Portable Fire Extinguisher Operations

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