

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

Course Prefix and Number: FST 220 **Credits:** 3

Course Title: Building Construction for Fire Protection

Course Description:

Provides the components of building construction that relate to fire and life safety. Focuses on firefighter safety. Covers the elements of construction and design of structures shown to be key factors when inspecting buildings, preplanning fire operations, and operating at emergencies. Lecture 3 hours per week.

General Course Purpose:

Introduces students to the way buildings are constructed so that they will better understand the forces, including fire, that tend to destroy buildings and the results of these forces.

Course Prerequisites and Co-requisites:

None

Student Learning Outcomes:

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

- Describe building construction as it relates to firefighter safety, buildings codes, fire prevention, code inspection, firefighting strategy, and tactics;
- Classify major types of building construction in accordance with a local/model building code;
- Analyze the hazards and tactical considerations associated with the various types of building construction;
- Explain the different loads and stresses that are placed on a building and their interrelationships;
- Identify the function of each principal structural component in typical building design
- Differentiate between fire resistance and flame spread, and describe the testing procedures used to establish ratings for each;
- Classify occupancy designations of the building code;
- Identify the indicators of potential structural failure as they relate to firefighter safety;
- Identify the role of a geographic information system (GIS) as it relates to building construction.

Major Topics to Be Included:

1. Introduction
 - a. History of Building Construction
 - b. Governmental Functions, Building and Fire Codes
 - c. Fire Risks and Fire Protection
 - d. Fire Loss Management and Life Safety
 - e. Pre-Fire Planning and Fire Suppression Strategies

2. Principles of Construction
 - a. Terminology and Definitions
 - b. Building and Occupancy Classifications
 - c. Characteristics of Building Materials
 - d. Types and Characteristics of Fire Loads
 - e. Effects of Energy Conservation
3. Building Construction
 - a. Structural Members
 - i. Definitions, Descriptions and Carrying Capacities
 - ii. Effects of Loads
 - b. Structural Design and Construction Methods
 - c. System Failures
4. Principles of Fire Resistance
 - a. Standards of Construction
 - b. Fire Intensity and Duration
 - c. Theory Versus Reality
5. Fire Behavior Versus Building Construction
 - a. Flame Spread
 - b. Smoke and Fire Containment
 - i. Construction and Suppression Systems
 - ii. HVAC Systems
 - iii. Rack Storage
 - iv. Combustible
6. Wood Construction
 - a. Definition and Elements of Construction
 - b. Types of Construction
 - c. Fire Stopping and Fire Retardants
 - d. Modifications/Code Compliance
7. Ordinary Construction
 - a. Definitions and Elements of Construction
 - b. Structural Stability and Fire Barriers
 - c. Modifications/Code Compliance
8. Collapse
9. Ventilation
10. Non-Combustible
11. Steel Construction
 - a. Definitions and Elements of Construction
 - b. Structural Stability, Fire Resistance and Fire Protection of Elements
 - c. Modifications/Code Compliance
12. Concrete Construction
 - a. Definitions and Elements of Construction
 - b. Structural Stability and Fire Resistance
 - c. Modifications/Code Compliance
13. High-Rise Construction

- a. Early Versus Modern Construction
- b. Vertical and Horizontal Extension of Fire and Smoke
- c. Fire Protection and Suppression
- d. Elevators
- e. Atriums/Lobbies
- f. Modifications/Code Compliance

14. Collapse

15. Ventilation

Effective Date/Updated: September 11, 2023