



COURSE OUTLINE

Course Number FIR 104	Course Title Building Construction	Credits 3
Hours:3 Lecture Lecture/Lab/Other	Co- or Pre-requisite: N/A	Implementation Semester & Year January 2022

Catalog description:

This course provides an examination of building design and construction with emphasis on fire protection and life safety. The elements of construction and design of structures are shown to be key factors when inspecting buildings, preplanning fire operations, and operating at emergencies.

General Education Category:

Not GenEd

Choose an item.

Course coordinator:

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Required texts & Other materials:

Brannigan's Building Construction for the Fire Service, 5th edition; Francis Brannigan and Glenn Corbett, Jones and Bartlett Publishers.

Course Student Learning Outcomes (SLO):

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

1. Demonstrate an understanding of building construction as it relates to firefighter safety, buildings codes, fire prevention, code inspection and firefighting strategy and tactics. (ILG 3, 7, 10), (PLO 1, 3, 4, 5, 6)
2. Classify major types of building construction. (ILG10), (PLO 3, 6)
3. Analyze the hazards and tactical considerations associated with the various types of building construction. (ILG 3, 10, 11), (PLO 3, 6)
4. Explain the different loads and stresses that are placed on a building and their interrelationships. (ILG 3, 10), (PLO 3, 6)
5. Identify the principle structural components of buildings and demonstrate an understanding of the functions of each. (ILG 3, 10, 11), (PLO 3, 6)
6. Differentiate between fire resistance and flame spread, and describe the testing procedures used to establish ratings for each. (ILG 3, 10, 11), (PLO 2)
7. Classify occupancy designations of the building code. (ILG 10), (PLO 6)
8. Identify the indicators of potential structural failure as they relate to firefighter safety.(ILG 3, 10, 11), (PLO 3, 7)
9. Identify and analyze the causes involved in the line of duty firefighter deaths related to structural firefighting, training and research and the reduction of emergency risks and accidents. (ILG 10, 11), (PLO 1, 3, 4, 5, 6, 7)

Course-specific Institutional Learning Goals (ILG):

Institutional Learning Goal 3.

Science: Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

Institutional Learning Goal 7: History: Students will understand historical events and movements in World, Western, non-Western or American societies and assess their subsequent significance.

Institutional Learning Goal 10: Information Literacy: Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

Institutional Learning Goal 11: Critical Thinking: Students will use critical thinking skills understand, analyze, or apply information or solve problems.

Program Learning Outcomes for (PLO)

1. Discuss the history, support organizations, resources, incident management, training, and emergency operations and relate how each plays a role within the fire service;
2. Define and use basic terms and concepts associated with the chemistry and dynamics of fire;
3. Apply principles of hydraulics, building construction, strategy, and tactics to fire ground operations;
4. Communicate the relationship of fire prevention and fire inspection;
5. Demonstrate the importance of public education in relation to fire prevention;
6. Evaluate facilities to appraise code compliance and potential hazards, building construction issues, and presence of appropriate fire protection systems to help ensure life safety both pre-incident and during an incident;
7. Employ safe work practices using recognized standards and regulations

Units of study in detail – Unit Student Learning Outcomes:

Learning Objectives

The student will be able to:

I. Introduction (Supports SLO 1)

- Understand the history of building construction
- Identify governmental functions, building and fire codes
- Correlate fire risks and the need for fire protection
- Understand fire loss management and life safety
- Identify pre-fire planning and fire suppression strategies

II. Principles of Construction (Supports SLO 1, 2, 4, 5)

- Understand terminology and definitions
- Identify building and occupancy classifications
- Identify characteristics of building materials
- Understand types and characteristics of fire loads
- Correlate the effects of energy conservation.

III. Building Construction (Supports SLO 2, 4, 5, 8)

- Identify structural members
- Understand definitions, descriptions and carrying capacities
- Understand the effects of loads
- Identify structural design and construction methods
- Predict system failures

IV. Principles of Fire Resistance (Supports SLO 2, 3, 5, 6, 8)

- Identify standards of construction
- Correlate fire intensity and duration
- Understand theory vs. reality

V. Fire Behavior vs. Building Construction (Supports SLO 2, 3, 4, 5, 6)

- Understand flame spread
- Identify methods of smoke and fire containment
- Correlate construction types and installed suppression systems
- Understand HVAC Systems
- Identify the challenges of rack storage

VI. Combustible Construction (Supports SLO 2, 3, 4, 5, 6, 7, 8, 9)

- Wood Construction
 - understand definition and elements
 - identify types of construction
 - identify fire stopping and fire retardants
 - understand modifications and code compliance
- Ordinary Construction
 - understand definition and elements
 - understand structural stability and fire barriers
 - understand modifications and code compliance
- Understand Collapse issues
- Understand Ventilation

VII. Non-Combustible Construction (Supports SLO 2, 3, 4, 5, 6, 7, 8, 9)

- Steel Construction
 - understand definitions and elements of construction
 - correlate structural stability, fire resistance and fire protection of elements
 - understand modifications and code compliance
- Concrete Construction
 - understand definitions and elements of construction
 - correlate structural stability and fire resistance
 - understand modifications and code compliance
- High Rise Construction
 - understand early vs. modern construction
 - understand vertical and horizontal extension of fire and smoke
 - identify fire protection and suppression needs
 - understand the design and installation of elevators
 - understand the design of atriums and lobbies
 - understand modifications and code compliance
- Understand Collapse issues
- Understand Ventilation

Evaluation of student learning: Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor. Periodic tests or quizzes as well as a final exam may be utilized. Other methods such as a research papers or group projects are encouraged.