

COURSE OUTLINE

Fire Technology 104
Building Construction for Fire Protection
(Previously listed as Fire Technology 115)

I. Catalog Statement

Fire Technology 104 investigates the components of building construction that relate to fire safety. The elements of construction and design of structures are shown to be key factors when inspecting buildings, preplanning fire operations, and operating during fires. The development and evolution of building and fire codes are studied in relationship to past fires in residential, commercial, and industrial occupancies. Fire Technology 104 meets or exceeds the California State Fire Marshal's Office core requirement for Fire 4.

Total Lecture Units: 3.0

Total Course Units: 3.0

Total Lecture Hours: 48.0

Total Faculty Contact Hours: 48.0

Prerequisite: Fire Technology 101 or equivalent.

II. Course Entry Expectations

Skills Level Ranges: Reading 5; Writing 5; Listening/Speaking 5; Math 3.

Prior to enrolling in this course, the student should be able to:

1. describe and discuss the components of the history and philosophy of the modern day fire service;
2. analyze the basic components of fire as a chemical reaction, the major phases of fire, and examine the main factors that influence fire spread and behavior;
3. differentiate between fire service training and education; fire protection certificate program and a fire service degree program; and explain the value of education in the fire service;
4. list and describe the major organizations that provide emergency response service and illustrate how they interrelate;
5. identify fire protection and emergency-service careers in both the public and in the private sector;
6. synthesize the role of national, state and local support organizations in fire protection and emergency services;

7. discuss and describe the scope, purpose, and organizational structure of fire and emergency services;
8. describe the common types of fire and emergency services facilities, equipment, and apparatus;
9. compare and contrast effective management concepts for various emergency situations;
10. identify and explain the components of fire prevention including code enforcement, public information, and public and private fire protection systems.

III. Course Exit Standards

Upon successful completion of the required coursework, the student should be able to:

1. define occupancy designations of the building code;
2. name the construction classifications that correspond to designated occupancies;
3. differentiate between the loads that are placed on a building and describe each type of load;
4. list the structural members on various types of construction;
5. compare and contrast the structural members on various types of construction;
6. define flames spread, hazards, contributing factors, and possible solutions;
7. demonstrate fire inspection practices that are applicable to individual buildings;
8. identify fire fighting practices and procedures that have developed for different types of construction.

IV. Course Content

Total Faculty Contact Hours = 48

- | | |
|--|---------|
| A. Orientation | 1 hour |
| 1. Attendance and grading | |
| 2. Course overview | |
| B. Introduction | 6 hours |
| 1. History of building construction | |
| 2. Governmental functions, building and fire codes | |
| 3. Fire risks and fire protection | |
| 4. Fire loss management and life safety | |
| 5. Pre-fire planning and fire suppression strategies | |
| C. Principles of Construction | 6 hours |
| 1. Terminology and definitions | |
| 2. Building and occupancy classifications | |
| 3. Characteristics of building materials | |
| 4. Types and characteristics of fire loads | |
| 5. Effects of energy conservation | |
| D. Building Construction | 5 hours |
| 1. Structural members | |
| a. Definitions, descriptions and carrying capacities | |

- b. Effects of loads
 - 2. Structural design and construction methods
 - 3. System failures

- E. Principles of Fire Resistance 4 hours
 - 1. Standards of construction
 - 2. Fire intensity and duration
 - 3. Theory vs. reality

- F. Fire Behavior vs. Building Construction 5 hours
 - 1. Flame spread
 - 2. Smoke and fire containment
 - a. Construction and suppression systems
 - b. HVAC systems
 - c. Rack storage

- G. Wood Construction 4 hours
 - 1. Definitions and elements of construction
 - 2. Types of construction
 - 3. Fire stopping and fire retardants

- H. Ordinary Construction 4 hours
 - 1. Definitions and elements of construction
 - 2. Structural stability and fire barriers

- I. Steel Construction 4 hours
 - 1. Definitions and elements of construction
 - 2. Structural stability, fire resistance and fire protection of elements

- J. Concrete Construction 4 hours
 - 1. Definitions and elements of construction
 - 2. Structural stability and fire resistance

- K. High Rise Construction 5 hours
 - 1. Early vs. modern construction
 - 2. Vertical and horizontal extension of fire and smoke
 - 3. Fire protection and suppression

V. Methods of Instruction

The following methods of instruction may be used in the course:

- 1. lecture;
- 2. demonstration;
- 3. films.

VI. Out of Class Assignments

The following out of class assignments may be used in the course:

1. individual projects (i.e. computational and written assignments, reading report);
2. group projects (i.e. homework problems, problem solving demonstrations, discussion on textbook topics).

VII. Methods of Evaluation

The following methods of evaluation may be used in the course:

1. quizzes;
2. midterm examination;
3. final examination.

VIII. Textbooks

Brannigan, Francis L., Brannigan's Building Construction For The Fire Service, [4th Edition]. Sudbury, MA: Jones and Bartlett Publishers, 2009.
10th Grade Textbook Reading Level. ISBN: 0763778028

Fire Protection Handbook, [19th Edition]. National Fire Protection Association, 2003.
10th Grade Textbook Reading Level. ISBN: 0877654743

IX. Student Learning Outcomes

1. Student will be able to define occupancy designations of the building code.
2. Student will be able to name the construction classifications that correspond to designated occupancies.
3. Student will be able to differentiate between the loads that are placed on a building and describe each type of load.
4. Student will be able to list the structural members on various types of construction.
5. Student will be able to compare and contrast the structural members on various types of construction.
6. Student will be able to define flames spread, hazards, contributing factors, and possible solutions.
7. Student will be able to demonstrate fire inspection practices that are applicable to individual buildings.
8. Student will be able to identify fire fighting practices and procedures that have developed for different types of construction.