Las Positas College
3000 Campus Hill Drive
Livermore, CA 94551-7650
(925) 424-1000
(925) 443-0742 (Fax)

Course Outline for FST 7

BUILDING CONSTRUCTION FOR FIRE PROTECTION

Effective: Fall 2019

I. CATALOG DESCRIPTION:
FST 7 — BUILDING CONSTRUCTION FOR FIRE PROTECTION — 3.00 units

This course provides the components of building construction related to fire 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 fire and collapse emergencies. Development and evolution of building and fire codes will be studies in the relationship to past fires and collapses in residential, commercial, and industrial occupancies.

3.00 Units Lecture

Prerequisite
FST 1 - Fire Protection Organization
with a minimum grade of C

Grading Methods:
Letter Grade

Discipline:
- Fire Technology

	MIN
Lecture Hours:	54.00
Expected Outside of Class Hours:	108.00
Total Hours:	162.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

A. FST1
1. Recognize and illustrate the history of the fire service.
2. Illustrate and explain the history and culture of the fire service.
3. Analyze the basic components of fire as a chemical chain reaction, the major phases of fire, and examine the main factors that influence fire spread and fire behavior.
4. Identify fire protection and emergency-service careers in both public and private sector.
5. Describe the common types of fire and emergency service facilities, equipment and apparatus.
6. Identify the primary responsibilities of fire prevention personnel including, code enforcement, public information, public and private protection systems.

IV. MEASURABLE OBJECTIVES:

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

A. Identify various classifications of building construction
B. Discuss theoretical concepts of how fire impacts major types of building construction
C. Describe building construction as it relates to firefighter safety, building codes, fire prevention, code inspection, fire fighting strategy and tactics
D. Classify major types of building construction in accordance with a local model building code
E. Analyze the hazards and tactical considerations associated with the various types of building construction
F. Explain the different loads and stresses that are placed on a building and their interelationships
G. Identify the function of each principle structural component in typical building design
H. Differentiate between fire resistance, flame spread, and describe the testing procedures used to establish ratings for each
I. Classify occupancy designations of the building code
J. Identify the indicators of potential structural failure as they relate to firefighter safety
K. Identify the role of GIS as it relates to building construction
L. Name the construction classification that correspond to designated occupancies
M. Define flame spread, its hazards, contributing factors and possible solutions
N. Identify fire fighting practices and procedures that have developed for different types of construction

V. CONTENT:

A. Principles of Construction
   1. Terminology and definitions
   2. Building and occupancy classifications
   3. Types and characteristics of fire loads
   4. Protection from the elements
   5. Protection from various events (seismic activity, wind events)
   6. Effects of energy conservation

B. Building Construction
   1. Types
   2. Combustible versus Non-Combustible
   3. Structural design and construction methods
   4. System failures

C. Principles of Fire Resistance
   1. Resistive assemblies
   2. Natuarally resistive materials
   3. Theory versus reality
   4. Fire intensity and duration

D. Fire Behavior versus Building Construction
   1. Flame spread
   2. Smoke and fire containment
   3. Drafting and air movement
   4. Restrictive barriers

E. Wood Construction
   1. Definitions and elements of construction
   2. Engineered woods versus natural state
   3. True dimension lumber versus dimension lumber
   4. Chamfer Cuts
   5. Types of woods utilized in construction
   6. Names of various dimension and types of wood products
   7. Fire resistive woods, fire retardant and fire stopping

F. Odinary Construction
   1. Definitions and elements of construction
   2. Structural stability and fire barriers
   3. Masonary construction

G. Collapse
   1. Different types of collapse and most likely causes

H. Ventilation
   1. Vertical versus Horizontal
   2. Positive pressure versus negative pressure
   3. Tools of ventilation

I. Steel Consttruction
   1. Definitions and elements of construction
   2. Fires affect upon steel
   3. Light weight unprotected Steel Truss versus I-Beam Steel Girders

J. Concrete Construction
   1. Pre and Post Tension Concrete
   2. Concrete Inspection and concrete with aggregate contamination

K. High Rise Construction
   1. Early versus modern construction
   2. Vertical and horizontal extension of fire and smoke
   3. Fire protection and suppression
   4. Compartmentation

L. Fire risks and fire protection

M. Fire life safety

N. Pre-fire planning and fire suppression strategies

VI. METHODS OF INSTRUCTION:

A. **Lecture** -

B. Video-taped instruction and observation

C. **Observation and Demonstration** - Demonstration of various Building Materials

D. Small group and individual participation in class discussions

E. Essay

F. Assigned reading and written work

VII. TYPICAL ASSIGNMENTS:

A. Students will draw a new constructed family residence

B. Students will present in a group a construction outline of a commercial building

C. Students will submit a preplan of a fire inspected commercial building

VIII. EVALUATION:

Methods/Frequency

A. Exams/Tests
   one midterm and one final exam

B. Quizzes
   bi-weekly

C. Projects
   one individual project

D. Group Projects
   one

E. Class Participation
   daily

F. Home Work
   one

G. Class Performance
   one

IX. TYPICAL TEXTS:

1. Brannigan, Francis, and Glenn Corbett. *Building Construction for the Fire Service.* 5th ed., Jones and Bartlett Learning, 2016.
2. IFSTA. *Building Construction Related to the Fire Service.* 4th ed., IFSTA , 2016.
3. Schwinge, Craig. *Knowing Your Building: A Firefighter's Reference Guide.* 2nd ed., Delmar Cengage Learning, 2017.
4. Smith, Michael. *Building Construction: Methods and Materials for the Fire Service.* 2nd ed., Pearson-Brady Fire, 2011.

X. OTHER MATERIALS REQUIRED OF STUDENTS:
   A. LPC Fire Service Technology Uniform