

# ***COCONINO COMMUNITY COLLEGE***

## ***COURSE OUTLINE***

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Status: Permanent

Date: December 4, 1991

A. Identification:

1. Subject Area: Fire Science
2. Course Number: FSC 241
3. Course Title: FIREFIGHTER SAFETY AND BUILDING CONSTRUCTION
4. Credit Hrs: 3
5. Catalog Description:  
Safety for firefighters on the fire ground. Effects of fire and heat on various types of building construction resulting in the loss of structure will be explored. Includes signs and symptoms of structural damage. Three lecture.

B. Course Goals:

To provide the students with the information needed concerning building construction which will assist the firefighter on the fireground and in building inspections.

C. Course Outcomes:

Students will:

A.

1. Determine the reaction to heat and fire of various types of building construction.
2. Understand methods of detection and extinguishment relating to concealed space fires in structures.
3. Recognize the problem of flame spread in occupancies as well as various approaches to the problem.

B.

1. Demonstrate a basic knowledge of the features of fire protection and life safety related to building construction that are germane to various types of occupancies.
2. Demonstrate a knowledge of the purpose of rated building construction.
3. Demonstrate a knowledge of acceptable test methods and marking or labeling for building construction assemblies or devices.
4. Know the different types of fire doors and installation requirements.
5. Demonstrate a basic knowledge of where rated building construction is required.
6. Demonstrate a knowledge of building construction components installed for fire-related purposes including but not limited to fire stops, draft curtains, fire walls, smoke vents, chimneys, flues, and rated ceilings.
7. Demonstrate a knowledge of the classes of roof coverings.
8. Demonstrate a knowledge of the requirements for and construction of special building construction features including but not limited to projection booths, stages, proscenium openings, and flammable liquid storage rooms.
9. Demonstrate a knowledge of building construction classifications.
10. Demonstrate a basic knowledge of the types of and installation requirements for building service equipment that are germane to various occupancies and which can, through their operation, affect fire protection and life safety.
11. Demonstrate a knowledge of the proper installations, maintenance and use of heating, ventilating and air conditioning systems from a fire safety standpoint including but not limited to attendant devices such as dampers, detection devices, thermostats and operation controls.
12. Demonstrate a knowledge of the proper installation, maintenance and use of various equipment, i.e. hoods, ducts, etc.
13. Identify the basic fire safety requirements for decorations, decorative materials and furnishings.
14. Identify general fire safety code requirements and regulations.
15. Demonstrate a knowledge of acceptable code enforcement procedures.

16. Identify local code enforcement procedures.
17. Demonstrate a knowledge of the storage handling and use conditions of flammable and combustible liquids which are most conducive to the initiation, propagation and spread of fire.
18. Identify the procedures for abating the fire hazards associated with flammable or combustible liquid spills or leaks.
19. Identify the physical and chemical characteristics of compressed and liquified gases and cryogenics.
20. Identify the sensitivity or stability characteristics of the various types of explosives.
21. Identify the hazards, resistance and the combustibility of various fibers, chemicals and explosives.
22. Identify interior finish requirements in various areas of a building according to its designated occupancy.
23. Demonstrate procedures for classifying building and/or contents according to hazard.
24. Identify factors affecting fire spread particular to:
  - a. wood construction
  - b. steel construction
  - c. concrete construction
  - d. high rise construction
25. Demonstrate a knowledge of color and density of smoke and flame and heat characteristics for various materials.
26. Demonstrate an ability to determine appropriate method of entry for firefighters into different constructions.
27. Identify methods of detection and extinguishment relating to concealed space fires in structures.
28. Identify the procedures for estimating fire severity and intensity.

D. Course Content:

Will include:

1. The Fire Problem
  - a. Building Codes
  - b. Fire Suppression
2. Principles of Construction
  - a. Characteristics of materials
  - b. Safety factors of materials
  - c. Structural elements
3. Wood Construction
  - a. Fire stopping
  - b. Wood shingle roofing
  - c. Heavy loads on wood buildings
  - d. Strength of wood
4. Ordinary Construction
  - a. Problems
  - b. Stability
  - c. Deficiencies
  - d. Roof and attic spaces
5. Garden Apartments
  - a. Fire safety
  - b. Characteristics of garden apartments
  - c. Fire tactics
6. Principles of fire Resistance
  - a. Standards
  - b. Estimating fire severity
  - c. Combustibility and fire resistance
  - d. Fire intensity and duration
7. Steel Construction
  - a. Significant characteristics
  - b. Unprotected steel
  - c. Fire walls

8. Concrete Construction
  - a. Structural elements
  - b. Pre-stressed concrete
  - c. Reinforced masonry
  - d. Fire problems while under construction
9. Flame Spread
  - a. Hazards of fiberboard
  - b. Decorations and content
  - c. Testing and rating
  - d. Prevention vs. suppression
10. Smoke and Fire Containment
  - a. Smoke and gases
  - b. Fire containment
  - c. Venting
  - d. Mis-education
11. High Rise Construction
  - a. Modern high rise
  - b. Forcible entry
  - c. Smoke movement
  - d. Sprinklers
  3. Fire suppression