

**FIRE 74 Course Outline as of Fall 2024****CATALOG INFORMATION**

Dept and Nbr: FIRE 74                      Title: FIRE PROTECT EQUIP & SYS  
 Full Title: Fire Protection Equipment and Systems  
 Last Reviewed: 11/25/2019

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	17.5	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable  
 Grading: Grade Only  
 Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP  
 Also Listed As:  
 Formerly: FIRE 54

**Catalog Description:**

An in-depth study of the systems used to provide built-in fire protection to structures including water distribution systems, fire detection and alarm systems, smoke management systems, fire pumps, automatic fire sprinkler systems, residential fire sprinkler systems, standpipe and hose systems, special extinguishing systems and portable fire extinguishers.

**Prerequisites/Corequisites:****Recommended Preparation:**

Completion of FIRE 71

**Limits on Enrollment:****Schedule of Classes Information:**

Description: An in-depth study of the systems used to provide built-in fire protection to structures including water distribution systems, fire detection and alarm systems, smoke management systems, fire pumps, automatic fire sprinkler systems, residential fire sprinkler systems, standpipe and hose systems, special extinguishing systems and portable fire extinguishers.

(Grade Only)

Prerequisites/Corequisites:

Recommended: Completion of FIRE 71

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:

<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
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<b>CSU Transfer:</b>	Transferable	Effective:	Spring 1984	Inactive:
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<b>UC Transfer:</b>		Effective:		Inactive:
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**CID:**

**Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

**Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Describe the different types of fire alarm systems and their operating principles.
2. Describe the different types of water based fire protection systems and their operating principles.
3. Describe the types of fire extinguishers and specialized fire protection systems and their application.

**Objectives:**

At the conclusion of this course, the student should be able to:

1. Describe the impact of historic fire events on modern fire protection systems.
2. Explain the basic principles of fire behavior and combustion.
3. Describe the basic components of municipal and private water systems and the ability to determine the proper flow and pressure using mathematics.
4. Describe the different types of modern fire alarm systems, their components and operation.
5. Describe the types of smoke management systems and their operation.
6. Describe the different types of fire pumps, their testing and operation.
7. Describe the operation, inspection, testing and maintenance requirements of the different types of standpipe systems.
8. Describe the different types of commercial automatic fire sprinkler systems, their components and operating principles.
9. Describe the different types of residential fire sprinkler systems, their components and operating principles.
10. Describe the different types of specialized extinguishing systems and their operating principles.
11. List the different types of portable fire extinguishers, the requirements for selection and

their maintenance and testing.

## **Topics and Scope:**

- I. History of Fire Prevention and Protection Systems
  - A. The application of fire regulations through history
  - B. Effects of fire catastrophes on fire and building codes
  - C. The role of the insurance industry in code development
- II. Fire Behavior and Construction
  - A. Fire as a chemical reaction
  - B. The major phases of fire
  - C. Factors that influence fire spread and fire behavior
- III. Introduction to Water Supply
  - A. Characteristics of water
  - B. Understanding water supply
  - C. Principles of municipal water supply systems
  - D. Private water supply systems
  - E. Fire flow and Friction loss
    1. Principles and coefficients of friction loss
    2. Calculating the fire flow of hydrants
- IV. Fire Alarm Systems
  - A. Types of fire alarm systems
  - B. Basic system components
  - C. Manual alarm-initiating devices
  - D. Automatic alarm-initiating devices
  - E. Inspecting and testing fire detection and signaling systems
  - F. Record keeping
- V. Smoke Management Systems
  - A. Purpose of smoke management systems
  - B. Types of smoke management systems
  - C. Advantages and disadvantages of dedicated and non-dedicated smoke management systems
- VI. Fire Pumps
  - A. Types of pumps
  - B. Pump components and accessories
  - C. Calculating pump discharge flow and pressure
  - D. Testing, inspection, and maintenance of fire pumps
- VII. Standpipes and Hose systems
  - A. Classification of standpipe systems
  - B. Types of standpipe systems
  - C. Components of standpipe systems
  - D. Flow and pressure requirements for standpipe systems
  - E. Procedures for augmenting standpipe systems
  - F. Inspecting and testing standpipes
- VIII. Automatic Fire Sprinkler Systems
  - A. Types of sprinkler systems
  - B. Components of sprinkler systems
  - C. Sprinkler system design, hydraulics and water supply requirements
  - D. Procedures for augmenting sprinkler systems
  - E. Restoring sprinkler systems
  - F. Inspecting and testing sprinkler systems
- IX. Residential Sprinkler Systems

- A. Purpose of residential sprinkler systems
- B. Design criteria of residential sprinkler systems
- C. Components of residential sprinkler systems
- D. Residential sprinkler system design and hydraulics
- X. Special Extinguishing Systems
  - A. Wet chemical extinguishing systems
  - B. Dry chemical extinguishing systems
  - C. Gaseous systems
  - D. Foam extinguishing systems
- XI. Portable Fire Extinguishers and their Agents
  - A. Extinguisher classifications
  - B. Extinguisher Types their agents
    - 1. Water
    - 2. Carbon dioxide
    - 3. Foams
    - 4. Halons
    - 5. Dry chemical agents
  - C. Selection, Maintenance and Testing of extinguishers
    - 1. Installation and placement of extinguishers
    - 2. Portable fire extinguishers on fire apparatus
    - 3. Inspecting, maintaining, and recharging extinguishers
    - 4. Hydrostatic testing
  - D. Use of portable extinguishers

**Assignment:**

1. Reading 30-50 pages from textbook per week
2. Viewing 3-5 on-line presentations
3. Completion of up to 17 assignment sheets
4. Group conferences (2 - 4)
5. Site visit(s) (1 - 2)
6. Term paper or on-line research project
7. Field trip
8. Quizzes (3 - 4), midterm, and final exam

**Methods of Evaluation/Basis of Grade:**

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written homework, and term paper or on-line research project
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Writing 20 - 25%
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**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Assignment sheet(s)
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Problem solving 10 - 15%
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**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations  
0 - 0%

**Exams:** All forms of formal testing, other than skill performance exams.

Quizzes, midterm, final exam

Exams  
60 - 65%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Group conferences, site visits, field trip, reading 30-50 pages per week

Other Category  
5 - 10%

**Representative Textbooks and Materials:**

Fire Protection Systems. 2nd ed. Jones Jr., Maurice. Jones & Bartlett Learning. 2015 (classic)  
Fire Protection, Detection and Suppression Systems. 5th ed. International Fire Service Training Association (IFSTA). 2016