

**FIP 144**  
**SPRINKLERS AND AUTOMATIC ALARMS**

**COURSE DESCRIPTION:**

Prerequisites: None

Corequisites: None

This course introduces various types of automatic sprinklers, standpipes, and fire alarm systems. Emphasis is on wet or dry systems, testing and maintenance, water supply requirements, fire detection and alarm systems, and other related topics. Upon completion, students should be able to demonstrate a working knowledge of various sprinkler and alarm systems as well as required inspection and maintenance. In addition, students study sprinkler systems and automatic alarms as they relate to selected NFPA standards. Course Hours Per Week: Class, 2. Lab, 2. Semester Hours Credit, 3.

**COURSE OBJECTIVES:**

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

- a. Define and categorize automatic sprinkler systems.
- b. Select appropriate operations to supply systems
- c. Preplan automatic sprinkler operations.
- d. Calculate capacity and duration specifications.
- e. Compute discharge density recommendations.
- f. Calculate water flow requirements for sprinkler systems.
- g. Evaluate automatic sprinkler heads.
- h. Assess operational differences in wet and dry pipe systems.
- i. Evaluate appropriate applications of deluge and preaction sprinkler systems.

**OUTLINE OF INSTRUCTION:**

- I. Standpipe and hose systems
  - A. Types of standpipe systems
  - B. Water supplies for standpipes
  - C. Standpipe testing procedures
  - D. Combined sprinkler systems and standpipes
  
- II. Fire department procedures for automatic sprinkler systems
  - A. Sprinkler system performance
  - B. Preplacing of automatic sprinkler operations
  - C. Operations in support of automatic sprinkler systems

- D. Fire department operations to support sprinklers in specialized occupancies
- III. Introduction to automatic sprinkler systems
  - A. Definition and purpose of automatic sprinkler systems
  - B. History of automatic sprinkler systems
  - C. The automatic sprinkler head
  - D. The wet pipe automatic sprinkler head
  - E. The dry pipe automatic sprinkler system
  - F. Future automatic sprinkler system developments
- IV. Water specifications for automatic sprinkler systems
  - A. Distribution of water
  - B. Capacity and duration specifications
  - C. NFPA recommendations
  - D. Automatic sprinkler discharge density recommendations
  - E. Water flow determination for sprinkler systems
  - F. Sprinkler system main drain flow testing
  - G. Hydrant flow testing
  - H. Calculation of water flow results
- V. Basic design of automatic sprinkler systems.
  - A. Water supply facilities
  - B. Pressure, gravity, and suction tanks
  - C. Fire department connections
  - D. Piping materials
  - E. Piping arrangement and schedules
  - F. Spacing of branch lines and sprinkler heads
  - G. Hydraulic sprinkler system design
  - H. National fire protection association procedure
  - I. Building modifications for sprinkler systems
- VI. The automatic sprinkler head
  - A. The development of automatic sprinkler heads
  - B. The standard sprinkler head
  - C. Hidden type of pendent sprinkler head
  - D. Sprinkler head actuators
  - E. Various types of automatic sprinkler heads
  - F. Components of the automatic sprinkler head
  - G. Functional types of automatic sprinkler heads
  - H. Decorative and coated sprinkler heads
  - I. Evaluation of automatic sprinkler heads
  - J. Underwriters laboratories evaluation
  - K. Factory mutual evaluation procedures
  - L. Automatic sprinkler head installation
- VII. The wet pipe automatic sprinkler system
  - A. Characteristics of the wet pipe automatic sprinkler system

- B. Waterflow devices for wet pipe sprinkler systems
  - C. The alarm check valve
  - D. Pilot valve type of alarm check valve
  - E. Inspection and test of wet pipe sprinkler system
  - F. Restoration of the wet pipe automatic sprinkler system after operation
  - G. Tests for pipe clogging on a wet pipe automatic sprinkler system
- VIII. The dry pipe automatic sprinkler system
- A. Characteristics of the dry pipe automatic sprinkler system
  - B. Dry pipe valves
  - C. Quick-opening-devices (Q.O.D.S.)
  - D. Exhausters
  - E. Accelerators
  - F. Low-differential dry pipe valve
  - G. Antifreeze solution sprinkler systems
  - H. Inspection and test of the dry sprinkler system
- IX. Deluge and preaction automatic sprinkler systems
- A. Characteristics of the deluge automatic sprinkler systems
  - B. Modes of deluge valve operation
  - C. Foam application through deluge sprinkler systems
  - D. Applications of deluge sprinkler systems
  - E. Praction automatic sprinkler systems
  - F. Inspection and testing of deluge and preaction sprinkler systems
  - G. Restoration of deluge systems
- X. Specialized automatic sprinkler systems
- A. Combined dry pipe and preaction automatic sprinkler system
  - B. The cycling automatic sprinkler system
  - C. Detector actuated sprinkler systems
  - D. Limited water supply automatic sprinkler systems
  - E. Specialized applications of automatic sprinkler systems
- XI. Exposure sprinkler and water spray systems
- A. Exposure sprinkler systems
  - B. Water spray systems
  - C. Water application rates for spray systems
  - D. Special applications of water spray systems
- XII. Supervision of automatic sprinkler systems
- A. Supervision of water supply components
  - B. Gravity tank supervision
  - C. Pressure tank supervision
  - D. Supervision of sprinkler system
  - E. Systems for the transmission and receipt of supervisory signals
  - F. Central station systems

- G. Local systems
- H. Remote station systems

**REQUIRED TEXTBOOK AND MATERIALS:**

Bryan, John. Automatic Sprinkler and Standpipe Systems. Third Edition. NFPA.

NFPA, NFPA 13 Installation of Sprinkler Systems. NFPA.

**STATEMENT FOR STUDENTS WITH DISABILITIES:**

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 686-3652 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1309.