

**CENTRAL TEXAS COLLEGE
SYLLABUS FOR FIRT 1338
FIRE PROTECTION SYSTEMS**

Semester Hour Credit: 3

**INSTRUCTOR:
OFFICE HOURS:**

I. INTRODUCTION

- A. This Fire Protection Systems presents an overview of automatic fire protection systems, with an emphasis on Sprinkler, Standpipe, and Specialized Extinguishing systems. This course includes information on fire behavior, the history and development of fire protection systems, and covers the design, standards, and water requirements of the more common types of systems.
- B. This is a required course for an Associate of Applied Science Degree in Fire Protection Technology, and is a required course for an Associate of Applied Science in General Studies, with a Certificate in Fire Protection.
- C. This course is occupationally related and serves as preparation for careers in Fire Protection and Fire Service.
- D. Prerequisite: None
- E. Alphanumeric coding used throughout the syllabus denotes the integration of SCANS occupational competencies (C) and Foundation skills. (F)

II. OVERALL OR GENERAL OBJECTIVES OF THE COURSE.

Upon successful completion of this course, Fire Protection Systems, the student will:

- A. Explain various types of automatic fire protection systems (C5-C7, F1,F2,F5,F6)
- B. Explain Standpipe and hose. (C5-C7,C9,C18,C19,F1,F2,F5,F17)
- C. Discuss water systems and other special fire protection systems for both municipalities and industries. (C5-C7,C9,C18,C19,F1,F2,F5,F17)
- D. Describe and know all aspects of fire detection and alarm systems. (C5-C7,C9,C18,C19,F1,F2,F5,F17)

III. INSTRUCTIONAL MATERIAL

The instructional materials identified for this course are viewable through www.ctcd.edu/books.

The current textbook is A. Maurice Jones, Jr., *Fire Protection Systems*, 2nd edition, 2015, Jones and Bartlett, 9781284035377.

IV. COURSE REQUIREMENTS

- a. Your first responsibility is scholarship. The grade you receive for this course will not be the grade of the instructor, but the grade you and you alone earn.
- b. This course is designed to require a steady, continuous effort from the student. A crash-cram policy will not result in the best grade possible. In addition to exams, factors such as class participation, initiative, attendance, and individual work will be considered in grade computation.
- c. You are encouraged to give your best effort throughout the semester. From the beginning, you should plan for a steady, organized, and continuous effort, which in the long run will prove more effective for your final grade than a last minute crash-cram policy. Your course grade is not determined solely by exam grade. Such factors as class participation, initiative, attendance, and individual research papers or projects will be considered in grade computation.
- d. From time to time, special library and other assignments may be made to members of the class, individually and in groups. You are expected to read all assignments and fulfill your responsibilities to any group assignments.
- e. You are expected to read all assigned material and bring your textbook to class. Keep up to date and informed on assignments, especially after a period of absence.
- f. Good class notes are indispensable for earning a good grade since both the material assigned and discussed will be the basis for examination material. Regular attendance is essential for the same reason.
- g. Scholastic Honesty: All students are required and expected to maintain the highest standards of scholastic honesty in the preparation of all coursework and during examinations. The following are considered examples of scholastic dishonesty:

Plagiarism: The taking of passages from the writing of others without giving proper credit to the sources.

Collusion: Using another's work as one's own, or working together with another person in the preparation of work, unless such joint preparation is specifically approved in advance by the instructor.

Cheating: Giving or receiving information on examinations.

- h. Special Work: Special assignments may be made during the semester, both for regular work or supplemental work.

V. EXAMINATIONS

- a. There will be a minimum of three (3) major examinations as follows:
 - 1. Three-week exam
 - 2. Mid-Term exam
 - 3. Twelve-week exam (optional)
 - 4. Final examination
- b. Unannounced short quizzes may be given covering any material that has been assigned from the beginning of the course.
- c. Occasionally a student will find it unavoidable to be absent from an exam. Only students with excused absences will be permitted to take make-up exams. Unexcused absences will result in a zero for the exam missed. The policy of the college is clearly stated in the catalog. A doctor's excuse is required in case of illness.
- d. The exams may be structured to include subjective and objective, or a mixture of both types of questions.

VI. SEMESTER GRADE COMPUTATION

<u>EXAM</u>	<u>POINTS</u>	<u>POINTS</u>	<u>GRADES</u>
Three Week Exam	150	900-1000	A=4pts/sem hr.
Mid-Term Exam	200	800-899	B=3pts/sem hr.
Twelve Week Exam(opt)	200	700-799	C=2pts/sem hr.
Final Exam	250	600-699	D=1pt/sem hr.
Homework/Quizzes	<u>200</u>	0-599	F=0pts/sem hr.
Total	1,000		

The twelve-week exam is optional: if it is not given, then those points will default to Homework/Quizzes and to Incentive points. Incentive points may be earned for factors such as attendance, initiative, participation in class discussions, and timely completion of assignments. Three points will be deducted for each unexcused absence. Military assignments or unavoidable circumstances will be evaluated upon notification to class instructor.

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM COURSE INSTRUCTOR

- a. Withdrawal from course: It is the student's responsibility to officially drop a class if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file a Central Texas College application for Withdrawal (CTC Form 59). The withdrawal form must be signed by the student.

CTC Form 59 will be accepted at any time prior to Friday of the 12th. Week of classes during the 16 week fall and spring semesters. The deadline for sessions of other lengths is as follows:

10 week session	Friday of the 8 th . Week.
8 week session	Friday of the 6 th . Week.
5 week session	Friday of the 4 th . Week.

The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

Students who officially withdraw will be awarded the grade of "W", provided the student's attendance and academic performance are satisfactory at the time of official withdrawal. Students must file a withdrawal application with the college before they may be considered for withdrawal.

At student may not withdraw from a class for which the instructor has previously issued the student a grade of "F" or "FN" for nonattendance.

- B. An Administrative Withdrawal: An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on the Administrative Withdrawal Form for submission to the Registrar.
- C. An Incomplete Grade: The College catalog states, "An incomplete grade may be given in cases where the student has completed the majority of the course work but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course...." Prior approval from the instructor is required before the grade of "I" is recorded. A students who merely fails to show for the final examination will receive a zero for the final and an "F" for the course.
- D. Cellular phones and Pagers: Cellular phones and pagers will be turned off while the student is in the classroom or laboratory.
- E. Americans with Disabilities Act (ADA): Disability Support Services provides services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Explore the website at

www.ctcd.edu/disability-support for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

VIII. COURSE OUTLINE

A. Unit One and Two: Chapter 1, Basics of Fire Behavior; and Chapter 2, Fire Protection Systems and the Model Code Process.

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Describe the difference between fire and combustion.
 - b. Identify and describe the elements of the fire triangle and tetrahedron.
 - c. List and describe the different types of fire, the different stages of fire, and forms of heat transfer.
 - d. List and describe methods used to extinguish fires.
 - e. List and describe the classes of fire and their relationship to extinguishing agents.
 - f. Define the terms code and model code.
 - g. Name the two most prominent model code organizations.
 - h. Describe the International Code Council (ICC) model code development process.
 - i. Describe the National Fire Protection Association (NFPA) model code development process.
 - j. Define the terms referenced standard and code amendment.
 - k. Describe the advantages to governments and organizations that adopt model codes.
 - l. List the two most important code-related conditions that determine the installation requirements for fire protection systems.

2. Learning Activities:
 - a. Read Chapters 1 & 2. pp. 4-35.
 - b. Review Key Terms and Case Study questions at end of chapters.
 - c. Answer Challenging Questions at end of chapters.
 - d. Three-week examination will be administered if one is given.

3. Unit Outline:
 - A. Introduction to Chapter 1
 - b. Combustion and Fire
 1. The Fire Triangle
 2. The Fire Tetrahedron
 - c. Fire and Flame Types
 1. Diffusion Flame
 2. Smoldering
 3. Spontaneous Combustion/Self-Heating
 4. Premixed Flame
 - d. The Stages of Fire

1. Incipient Stage
2. Free Burning Stage
3. Flashover Stage
4. Smoldering/Decay Stage
- e. Forms of Heat Transfer
 1. Conduction
 2. Convection
 3. Radiation
- f. Methods of Extinguishing Fires
 1. Cooling
 2. Oxygen Reduction
 3. Removing or Interrupting the Fuel Supply
 4. Interrupting the Chain Reaction
- g. Classes of Fire
 1. Class A Fires and Extinguishing Agents
 2. Class B Fires and Extinguishing Agents
 3. Class C Fires and Extinguishing Agents
 4. Class D Fires and Extinguishing Agents
 5. Class K Fires and Extinguishing Agents
- H. Introduction to Chapter 2
 - i. A Model Code
 - j. Model Code Organizations
 1. International Code Council (ICC)
 2. National Fire Protection Association (NFPA)
 - k. Reference Standards
 - l. Code and Standards Development for Government
 1. Amendments
 - m. Code-Required Fire Protection Systems
 - n. Inducements to Install Fire Protection Systems

B. Units Three and Four: Chapter 3, Fire Alarm System Components and Functions; and Chapter 4, Types of Fire Alarm and Detection Systems.

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Describe a fire alarm system
 - b. List five functions fire alarm systems provide
 - c. List and describe the three types of fire alarm systems
 - d. Discuss the characteristics of conventional fire alarm system technology
 - e. Discuss the characteristics of addressable fire alarm system technology
 - f. Discuss the functions of a fire alarm control panel and annunciation panel.
 - g. List and describe devices that interface with a fire alarm system to supervise the condition of other fire protection systems
 - h. List and discuss the different fire alarm system classifications

- i. List and discuss the interface capabilities between fire alarm systems and other building fire protection and life safety systems
- j. List and discuss the different conditions, situations, and circumstances used to determine manual fire alarm and automatic detection system installation requirements
- k. Describe the different acceptance and periodic inspections, tests, and maintenance activities required for fire alarm systems

2. Learning Activities:

- a. Read Chapters 3 & 4. pp. 38-99.
- b. Review Key Terms and Case Study questions at end of chapters.
- c. Answer Challenging Questions at end of chapters.

3. Unit Outline:

- A. Introduction to Chapter 3
- b. Fire Alarm Control Panel/Unit
 - 1. Types of Fire Alarm Signals
- c. Initiating Devices
 - 1. Manual Initiating Devices
 - 2. Automatic Initiating Devices
- d. Notification Appliances
 - 1. Public Mode/Private Mode Notification
 - 2. Coded, Non-Coded, and Textural Signals
 - 3. Audible Appliances
 - 4. Visible Appliances
 - 5. Combination Appliances
 - 6. Addressable Notification Appliances
- e. Annunciation Panels
- f. Power Expander Panels
- g. Other Components and Systems Associated with Fire Alarm Systems
 - 1. Electronic Valve Supervisory Devices
 - 2. Pressure Switches
 - 3. Air and Water Temperature Sensors/Water Level Sensors
- H. Introduction to Chapter 4
- i. Classification of Fire Alarm Systems
 - 1. Alarm Systems
 - a. Fire Alarm Systems
 - b. Supervising Station Alarm Systems
 - c. Emergency Communication Systems
 - 2. Emergency Communication Systems
 - a. One-Way Emergency Communication Systems
 - b. Two-Way Emergency Communication Systems
- j. Interface with Other Systems
- k. Required Installations
 - 1. Use-Group and Occupancy
 - 2. Number of Occupants

3. Building Height
4. Level of Discharge
5. Manufacturing and Use of Products
6. Special Use and Occupancy Conditions
7. Installation of Other Fire Protection Systems
- l. Design and Installation Standards
- m. Fire Alarm System Inspection and Testing
 1. Acceptance Test
 2. Periodic Inspection, Testing, Service, and Maintenance

C. Units Five and Six: Chapter 5, Water Supplies for Protection Systems; and Chapter 6, Standpipe and Hose Systems

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Define the term *pressure*, *flow*, and *duration* as they relate to the movement of water
 - b. Identify and describe the components of a water supply and distribution network
 - c. Discuss the difference between a municipal/public water system and a private water system
 - d. Describe how pumped, gravity, and combined supply systems operate
 - e. Define friction loss and discuss how it affects water flow
 - f. Define the terms *static pressure* and *residual pressure*.
 - g. List and discuss the characteristics of the two types of NFPA-approved stationary fire pumps
 - h. Define the terms *churn*, *rated performance*, and *peak performance* in relations to stationary fire pump testing
 - I. List and describe the different types of standpipes and the different standpipe classifications
 - j. List and describe the different standpipe system components
 - k. State when and where standpipes and hose systems are required in buildings
 - l. Reference the design and installation standards that apply to standpipes.
 - m. State the minimum standpipe system design pressure and flow requirements.
 - n. Reference the inspection, testing, and maintenance requirements
 - o. Recognize the possible impairments to standpipe systems
2. Learning Activities:
 - a. Read Chapters 5 and 6, pp. 102-168.
 - b. Review Key Terms and Case Study questions at end of chapters.
 - c. Answer Challenging Questions at end of chapters.

3. Unit Outline:
 - A. Introduction to Chapter 5
 - b. Types of Standpipes
 1. Automatic Wet Standpipe
 2. Automatic Dry Standpipe
 3. Semiautomatic Standpipe
 4. Manual Wet Standpipe
 5. Manual Dry Standpipe
 6. Combined Standpipe and Sprinkler Systems
 - c. Classification of Standpipe Systems
 1. Class I Standpipe System
 2. Class II Standpipe System
 3. Class III Standpipe System
 - d. Standpipe Department Connections
 1. Fire Department Connection
 2. Pipe and Fittings
 3. Gauges
 4. Valves
 5. Hose Cabinets, Hose, Hose Racks, and Nozzles
 - e. Required Installations
 1. Requirements Based on Building Height and Levels
 2. Occupancy Requirements
 3. Buildings under Construction, Rehabilitation or Demolition
 - f. Design and Installation Standards
 - g. Water Pressure and Flow Requirements
 1. Minimum and Maximum Pressure Requirements
 2. Minimum and Maximum Flow Requirements
 - h. Inspection, Testing, and Maintenance Requirements
 1. Hydrostatic and Air Test
 2. Visual Inspection
 3. Flushing
 4. Flow Tests
 5. Main Drain Test
 6. Operation of Components
 7. Periodic Inspection, Testing, and Maintenance

D. Units Seven and Eight: Chapter 7, Automatic Fire Sprinkler Systems; and Chapter 8, Specialized Water-Based Fire Protection Systems

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Describe an automatic fire sprinkler system
 - b. Discuss the myths and realities associated with automatic fire sprinkler system operation
 - c. List and describe the different components that make up an automatic fire sprinkler system
 - d. List and describe the different types of automatic fire protection system heads

- e. Describe the different types of automatic fire sprinkler systems and the best applications for those systems
- f. State the factors that determine requirements to install automatic fire sprinkler systems
- g. Discuss the design concepts behind automatic fire sprinkler systems
- h. List and describe different occupancy & commodity classifications
- i. Discuss the inspection and testing requirements for automatic fire sprinkler systems
- j. State three reasons why, under certain circumstances, the installation of specialized types of water-based fire protection systems is a better choice than standard automatic fire sprinkler systems
- k. Discuss the characteristics & applications for fixed foam systems; for foam-water sprinkler and foam-water spray systems; for water spray fixed systems; and for water mist systems.
- l. Discuss the inspection and test requirements for acceptance of specialized water-based fire protection systems
- m. Recognize the possible impairments to specialized water-based fire protection systems

2. Learning Activities:

- a. Read Chapters 7 & 8, pp. 169-241.
- b. Review Key Terms and Case Study questions at end of chapters.
- c. Answer Challenging Questions at end of chapters.

3. Unit Outline:

- A. Introduction to Chapter 7
 - a. Effectiveness in Property Protection
 - b. Effectiveness in Life Safety
- b. Fire Sprinkler System Components
 - a. Pipe and Fittings
 - b. Gauges
 - c. Valves
 - d. Pipe Support and Stabilization Assemblies
 - e. Automatic Sprinkler Heads
- c. Types of Systems
 - a. Wet Pipe Systems
 - b. Dry Pipe Systems
 - c. Preaction Systems
 - d. Deluge Systems
 - e. Residential Sprinkler Systems
- d. Required Installations
- e. Design and Installation Standards
 - 1. NFPA 13, *Standard for the Installation of Sprinkler Systems*
 - 2. NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings*

- 3. NFPA 13R, *Standard for the Installation of Systems in Low-Rise Residential Occupancies*
 - 4. Other Fire Sprinkler Standards
 - f. Design Concepts for Automatic Fire Sprinkler Systems
 - g. Inspection, Testing, and Maintenance Requirements
 - 1. Acceptance Inspections and Tests
 - 2. Periodic Inspection, Testing, and Maintenance
 - H. Introduction to Chapter 8
 - i. Types of Specialized Water-Based Fire Protection Systems
 - 1. Fixed Foam Systems
 - 2. Foam-Water Sprinkler and Foam-Water Spray Systems
 - 3. Water Spray Fixed Systems
 - 4. Water Mist Systems
 - j. Inspection, Testing, and Maintenance Required
 - 1. Periodic Inspection, Testing, and Maintenance
- E. Units Nine and Ten: Mid-Term Examination; and Chapter 9, Fixed Wet and Dry Chemical Extinguishing Systems
1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Describe the characteristics of fixed wet and dry chemical extinguishing systems
 - b. Discuss the hazards fixed wet and dry chemical extinguishing systems most likely protect
 - c. Describe how fixed wet and dry chemical agents control and extinguish fire.
 - d. Define a pre-engineered system
 - e. List the major components that make up fixed wet and dry chemical extinguishing systems
 - f. Describe the types of fixed wet and dry chemical extinguishing systems
 - g. Discuss the types of fixed wet and dry chemical extinguishing systems, maintenance requirements for fixed wet and dry chemical extinguishing systems
 2. Learning Activities:
 - a. Review first eight chapters and administer mid-term examination
 - b. Read Chapter 9, pp. 243-261.
 - c. Review Key Terms and Case Study questions at end of the chapter.
 - d. Answer Challenging Questions at end of the chapter.
 3. Unit Outline:
 - a. Introduction to Chapter 9
 1. Fixed Wet Chemical Extinguishing Systems
 2. Fixed Dry Chemical Extinguishing Systems
 3. Fixed Wet and Dry Chemical Extinguishing System Operations

- b. Standards for Wet and Dry Chemical Systems
- c. System Components Requirements
 - 1. Agent Storage Containers and Gas Cartridges
 - 2. Piping and Fittings
 - 3. Nozzles
 - 4. Activation Devices
 - 5. System Alarms and Indicators
- d. Types of Fixed Wet and Dry Extinguishing Systems
 - 1. Local Application Systems
 - 2. Total Flooding Systems
 - 3. Other Wet and Dry Chemical Application Methods
- e. Inspection, Testing, and Maintenance
 - 1. Visual Inspections
 - 2. Discharge Test
 - 3. Acceptance Test
 - 4. Periodic Inspection, Testing, and Maintenance

F. Units Eleven and Twelve: Chapter 10, Gaseous Agent Extinguishing Systems; and Chapter 11, Portable Fire Extinguishers

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Describe the physical characteristics of carbon dioxide
 - b. Describe the four application methods for delivery of CO₂
 - c. Describe the physical characteristics of halogenated hydrocarbons (halons)
 - d. Explain the halon numbering identification system
 - e. Describe the physical characteristics of halocarbons and inert gases (clean agents)
 - f. Discuss the two categories of clean agents
 - g. Explain the difference between the two types of aerosol generators
 - h. Discuss the various acceptance and periodic inspections and tests that are required to certify and maintain gaseous agent extinguishing systems
 - i. Discuss the fire extinguisher classification system
 - j. List the different extinguishing agents and their applications
 - k. Discuss the fire extinguisher rating system and identify which classifications or extinguishers it applies
 - l. Explain why a certain extinguisher classification requires a conductivity test
 - m. Describe the different types of fire extinguishers and how they operate
 - n. Explain the acronym PASS in relation to fire extinguisher operation
 - o. Discuss the inspection, testing, and maintenance procedures for portable fire extinguishers

2. Learning Activities:

- a. Read Chapters 10 and 11, pp. 263-299
- b. Review Key Terms and Case Study questions at end of chapters.
- c. Answer Challenging Questions at end of chapters.
- d. Twelve-week examination will be administered if one is given.

3. Unit Outline:

- A. Introduction to Chapter 10
- b. Carbon Dioxide
- c. Carbon Dioxide Extinguishing Systems
 - 1. Low- and High-Pressure Storage
 - 2. Carbon Dioxide Delivery Systems
- d. Halogenated Agents
- e. Halon Extinguishing Systems
 - 1. Halon Delivery Systems
- f. Clean Agents
 - 1. Categories of Clean Agents
- g. Clean Agent Extinguishing Systems
- h. Aerosol
- i. Aerosol Extinguishing Systems
- j. Approval and Periodic Inspections, Testing, and Maintenance
 - 1. Carbon Dioxide
 - 2. Halon
 - 3. Clean Agents
 - 4. Aerosol
- K. Introduction to Chapter 11
- l. Code Requirements for Fire Extinguishers
- m. Fire Extinguisher Classification
- n. Common Fire Extinguisher Agents
 - 1. Water
 - 2. Foam
 - 3. Carbon Dioxide
 - 4. Dry Chemicals
 - 5. Wet Chemicals
 - 6. Dry Powders
 - 7. Halon and other Clean Agents
- o. Fire Extinguisher Ratings
- p. Types of Fire Extinguishers
 - 1. Pump Extinguishers
 - 2. Stored Pressure Extinguishers
 - 3. Cartridge Pressure Extinguishers
 - 4. Obsolete Types of Fire Extinguishers
- q. Fire Extinguisher Operation
- r. Inspection, Testing, and Maintenance
 - 1. Visual Inspection
 - 2. Maintenance
 - 3. Testing

G. Units Thirteen and Fourteen: Chapter 12, Smoke Control and Management Systems; and Chapter 13, Property Security, Emergency Response, and Fire Protection Systems

1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Define the terms *smoke control* and *smoke management*
 - b. State the design goals for smoke control and smoke management systems
 - c. Name the three general methods used to control smoke movement
 - d. Describe the four pressure differential methods used to control smoke
 - e. Describe the five design requirements or operational characteristics of smoke control systems
 - f. List the different life safety and fire protection systems that interface with smoke control systems and describe how they interact
 - g. Discuss the importance of the acceptance testing and annual retesting of smoke control and management systems
 - h. Identify and describe the three components of a means of egress
 - i. List and describe the override requirements for exit stairway doors in high-rise buildings
 - j. List and describe the requirements for delayed egress locks; for access-controlled egress doors; for electrically controlled and electromagnetically locked egress doors
 - k. Describe the purpose of an emergency building entrance system
 - l. List what is typically found inside an emergency building entrance system
 - m. List and describe the different methods of property access through security and gates and vehicle barriers

2. Learning Activities:
 - a. Read Chapters 12 and 13, pp. 302-334.
 - b. Review Key Terms and Case Study questions at end of chapters.
 - c. Answer Challenging Questions at end of chapters.

3. Unit Outline:
 - a. Introduction to Chapter 12
 - b. Code-Required Smoke Control and Smoke Management
 - c. Smoke Containment, Removal, and Opposed Airflow
 1. Containment by pressure differentials
 2. Smoke Removal
 3. Containment by Airflow Direction
 - d. Design Requirements and Operational Characteristics
 - e. Fire Protection Systems and Smoke Control
 1. Interface with Fire Protection Systems and Other Life

- f. Testing and Performance Verification
- G. Introduction to Chapter 13
- h. Means of Egress
 - 1. Exit Access
 - 2. Exit
 - 3. Exit Discharge
 - 4. Maintaining the Means of Egress
- i. Exit Stairway Doors
 - 1. Stairway Doors in High-Rise Buildings
- j. Delayed Egress Locks
- k. Access-Controlled Egress Doors
 - 1. Electrically Controlled and Electromagnetically Locked Egress Doors
- m. Fire Department Access Systems
- n. Security Gates
 - 1. Siren Sensors
 - 2. Proprietary Fire Department Access Key
 - 3. Access Cards and Access Codes
 - 4. Radio Frequency Sensor
 - 5. Fire Protection System Interface

H. Unit Fifteen and Sixteen: Course Review and Final Examination

- 1. Unit Objectives: Upon successful completion of this unit, the student will be able to:
 - a. Determine the degree of presentation & retention of the knowledge and information presented in this course.
 - b. Express the materials studied in a learned manner to others.
 - c. Apply what is learned to their homes and workplaces in relevant and meaningful ways for the health and safety of others.
- 2. Learning Activities:
 - a. Review and discuss all material presented during this course
 - b. Ask question and discuss answers and ideas
 - c. Administer, grade and discuss final examination and assign final course grades