



# Inspecting New and Existing Fire and Life Safety Systems and Equipment

## Course Plan

### Course Details

<b>Certification:</b>	Fire Inspector 2
<b>CTS Guide:</b>	Fire Inspector 2 Certification Training Standards Guide (2014)
<b>Description:</b>	This course provides students with a basic knowledge of inspection requirements related to the roles and responsibilities of a Fire Inspector 2 including inspection of life safety systems and building services equipment, fire protection systems, and emergency access criteria.
<b>Designed For:</b>	The certified Fire Inspector 1 advancing to the Fire Inspector 2 classification
<b>Prerequisites:</b>	Fire Inspector 2A: Fire Prevention Administration
<b>Standard:</b>	Complete all activities and formative tests. Complete all summative tests with a minimum score of 80%.
<b>Hours:</b>	Lecture: 22:30 Activities: 00:30 Testing: 1:00
<b>Hours (Total):</b>	16:00
<b>Maximum Class Size:</b>	30
<b>Instructor Level:</b>	Primary Instructor
<b>Instructor/Student Ratio:</b>	1:30
<b>Restrictions:</b>	None
<b>SFT Designation:</b>	CFSTES

### Required Resources

#### Instructor Resources

To teach this course, instructors need:

- California Building Code  
(International Code Council, current edition)
- California Code of Regulations (CCR) Title 19  
(Office of Administrative Law, <https://oal.ca.gov/>)
- California Fire Code  
(International Code Council, current edition)

Reference manual options:

- *Fire Inspection and Code Enforcement Instructor Resource Kit*  
(IFSTA, 8th edition)

Or the combination of the following:

- *Fire Inspector: Principles and Practice*  
(International Association of Fire Chiefs, Revised Enhanced 1st edition, Jones & Bartlett Learning, ISBN: 9781284137743)
- *Fire Inspector: Principles and Practice Instructor's ToolKit* CD-ROM  
(International Association of Fire Chiefs, Cdr edition, Jones & Bartlett Learning, ISBN: 9781284095654)

#### Online Instructor Resources

The following instructor resources are available online at

<https://osfm.fire.ca.gov/divisions/state-fire-training/cfstes-professional-certification/>:

- Course plan
- Website

#### Student Resources

To participate in this course, students need:

- California Fire Code  
(International Code Council, current edition)

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Reference manual options:

- *Fire Inspection and Code Enforcement*  
(IFSTA, 8th edition, ISBN: 9780879396053)

Or

- *Fire Inspector: Principles and Practice*  
(International Association of Fire Chiefs, Revised Enhanced 1st edition, ISBN:  
9780763798574)

### Unit 1: Introduction

#### Topic 1-1: Orientation and Administration

##### Terminal Learning Objective

At the end of this topic, a student will be able to identify facility and classroom requirements and identify course objectives, events, requirements, assignments, activities, resources, evaluation methods, and participation requirements in the course syllabus.

##### Enabling Learning Objectives

1. Identify facility requirements
  - Restroom locations
  - Food locations
  - Smoking locations
  - Emergency procedures
2. Identify classroom requirements
  - Start and end times
  - Breaks
  - Electronic device policies
  - Special needs and accommodations
  - Other requirements as applicable
3. Review course syllabus
  - Course objectives
  - Calendar of events
  - Course requirements
  - Student evaluation process
  - Assignments
  - Activities
  - Required student resources
  - Class participation requirements

##### Discussion Questions

1. What is a formative test? What is a summative test?

##### Activities

1. To be determined by the instructor.

#### Topic 1-2: Fire Marshal Certification Process

##### Terminal Learning Objective

At the end of this topic, a student will be able to identify different levels in the Fire Marshal certification track, the courses and requirements for Fire Inspector 2 certification, and be able to describe the capstone task book and testing process.

##### Enabling Learning Objectives

1. Identify the different levels of certification in the Fire Inspector certification track
  - Fire Inspector 1

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- Fire Inspector 2
- 2. Identify the other Fire Prevention certification tracks
  - Plans Examiner
  - Fire Marshal
- 3. Identify the courses required for Fire Inspector 2
  - Fire Inspector 2A: Fire Prevention Administration
  - Fire Inspector 2B: Fire and Life Safety Requirements
  - Fire Inspector 2C: Fire and Life Safety Systems and Equipment Inspections
  - Fire Inspector 2D: Hazardous Materials, Operations, and Processes
- 4. Identify any other requirements for Fire Inspector 2
- 5. Describe the capstone task book process
  - Complete all prerequisites and course work
  - Submit application and fees to request capstone task book
    - Must be employed by a California Fire Agency as a Fire Inspector
  - Complete all job performance requirements included in the task book
  - Must have identified evaluator verify individual task completion via signature
  - Must have Fire Chief or authorized representative verify task book completion via signature
- 6. Describe the capstone testing process
  - Complete coursework
  - Schedule online capstone test
  - Schedule skills evaluation test

### Discussion Questions

1. How many levels are there in the Fire Marshal certification track? What are they?

### Activities

1. To be determined by the instructor.

## Unit 2: Life Safety Systems and Building Services Equipment

### Topic 2-1: Evaluating Fire, Life Safety, and Property Protection Equipment

#### Terminal Learning Objective

At the end of this course, a student, given field observations of the facility and documentation, the hazards protected, and system specifications, will be able to evaluate fire protection systems and equipment provided for life safety and property protection to approve them for the protected occupancy or hazard.

#### Enabling Learning Objectives

1. Identify applicable codes and standards for fire protection systems
2. Discuss basic physical science as it relates to fire behavior and fire suppression
3. Discuss implications and hazards associated with system operation
4. Describe installation techniques and acceptance inspection
5. Describe testing and reports of maintenance of completed installations
6. Describe the use and function of various systems

7. Recognize problems with fire protection systems and equipment
8. Use codes and standards to evaluate fire protection systems and equipment
9. Read reports, plans, and specifications to determine whether life safety and property protection measures are appropriate for the protected occupancies or hazards

### Discussion Questions

1. What kind of hazards might be associated with a clean-agent system?
2. What are the key elements of an acceptance inspection?

### Activities

1. To be determined by the instructor.

### Instructor Notes

1. This Terminal Learning Objective includes buildings under construction or demolition. Building documentation includes performance-based design documents to ensure input features remain applicable to the building as it is currently configured. The design documentation should include an Operations and Maintenance Manual, which acts as a user guide to the performance-based design. The Operations and Maintenance Manual includes the assumptions and estimates made during the design regarding concepts such as selected fire scenarios and fuel loads, building use, occupant characteristics, and system reliability. The inspector should be able to compare these original assumptions and estimates to those that would be used to evaluate the building as it is currently configured.

**CTS Guide Reference:** CTS 3-4

## Topic 2-2: Verifying Code Compliance of Building Service Equipment and Operations

### Terminal Learning Objective

At the end of this topic, a student, given field observations, will be able to verify code compliance of heating, ventilation, air conditioning, and other building service equipment and operations to verify maintenance in accordance with applicable codes and standards and identify, document, and report deficiencies in accordance with jurisdictional policies.

### Enabling Learning Objectives

1. Describe types, installation, maintenance, and use of building service equipment
  - Lighting
  - Heating, ventilating and air conditioning
  - Elevators and escalators
2. Describe the operation of smoke and heat vents
3. Describe the installation of kitchen cooking equipment (including hoods and ducts), laundry chutes, elevators, and escalators
4. Identify applicable codes and standards adopted by the jurisdiction
5. Observe and recognize problems with HVAC and other building service equipment and operations
6. Interpret codes and standards related to building services equipment and write reports to document deficiencies

### Discussion Questions

1. What are the operating principles of heat or smoke vents?
2. What deficiencies might you find when reviewing kitchen cooking equipment for code compliance?

### Activities

1. To be determined by the instructor.

**CTS Guide Reference:** CTS 3-12

## Topic 2-3: Verifying Installation, Inspection, and Testing of Life Safety Systems and Building Services Equipment

### Terminal Learning Objective

At the end of this topic, a student, given a performance-based design, will be able to verify that life safety systems and building services equipment are installed, inspected, and tested to perform as described in the engineering documents and the operations and maintenance manual that accompanies the design to identify, document, and report deficiencies in accordance with applicable codes and standards and jurisdictional policies.

### Enabling Learning Objectives

1. Describe applicable codes and standards for installation and testing of fire protection systems
  - Water based extinguishing system
  - Special agent system
  - Fire detection and alarm system
2. Describe how to verify that means of egress are installed, inspected, and tested as designed
3. Describe how to verify that building services equipment is installed, inspected, and tested as designed
  - Lighting
  - Heating, ventilating and air conditioning
  - Elevators and escalators
4. Witness and document tests of fire protection systems and building services equipment
  - Identify, document, and report deficiencies

### Discussion Questions

1. How is an HVAC system utilized for fire control?
2. In a mixed-use occupancy, do all the occupancies require a fire alarm system?

### Activities

1. To be determined by the instructor.

**CTS Guide Reference:** CTS 3-11

### Topic 2-4: Evaluating Compliance of Life Safety Systems and Building Services Equipment with Construction Documents

#### Terminal Learning Objective

At the end of this topic, a student, given a performance-based design, will be able to evaluate compliance with construction documents to ensure after installation, inspection, and testing, that life safety systems and building services equipment perform as described in the engineering documents and the operations and maintenance manual that accompanies the design; and to identify, document, and report deficiencies in accordance with the policies of the jurisdiction.

#### Enabling Learning Objectives

1. Identify applicable codes and standards for installation and testing of
  - Fire protection systems
  - Life safety systems
  - Building services equipment
2. Witness and document tests of fire protection systems and building services equipment
  - Identify, document, and report deficiencies

#### Discussion Questions

1. What construction documents would you utilize when evaluating the compliance of building services equipment, fire protection systems, and life safety systems?
2. What information can be obtained from an operations and maintenance manual to assist in evaluating various life safety systems?

#### Activities

1. To be determined by the instructor.

**CTS Guide Reference:** CTS 3-23

## Unit 3: Fire Protection Systems

### Topic 3-1: Reviewing Proposed Installation of Fire Protection Systems

#### Terminal Learning Objective

At the end of this topic, a student, given shop drawings and system specifications for a process or operation, will be able to review the proposed installation of fire protection systems for code compliance and installation in accordance with the approved drawings, and identify, document, and report deficiencies in accordance with applicable codes and standards and jurisdictional policies.

#### Enabling Learning Objectives

1. Describe proper selection, distribution, location, and testing of portable fire extinguishers
2. Discuss methods used to evaluate the operational readiness of water supply systems used for fire protection
3. Describe the evaluation and testing of automatic sprinkler, water spray, and standpipe systems and fire pumps

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4. Describe the evaluation and testing of fixed fire suppression systems
5. Describe the evaluation and testing of automatic fire detection and alarm systems and devices
6. Read basic floor plans or shop drawings and identify symbols used by the jurisdiction
7. Review the proposed installation of fire protection systems for compliance, and identify, document, and report deficiencies

### Discussion Questions

1. What type of extinguisher should be identified for use in a B occupancy?
2. What are the minimum spacing requirements for fire extinguishers?

### Activities

1. Given a set of plans, verify the proper selection, distribution, and location of portable fire extinguishers for a given occupancy.

### Instructor Notes

1. The Fire Inspector 2 is expected to be able to evaluate proposed fire protection systems and equipment for moderately technical applications. Knowledge of the compatibility and effectiveness of the protection systems and equipment with the hazard to be protected is essential.

**CTS Guide Reference:** CTS 4-3

## Topic 3-2: Reviewing Installed Fire Protection Systems

### Terminal Learning Objective

At the end of this topic, a student, given an installed system, shop drawings, and system specifications for a process or operation, will be able to verify that the fire protection systems are installed in compliance with code and in accordance with the approved drawings, and identify, document, and report deficiencies in accordance with applicable codes, standards, and jurisdictional policies.

### Enabling Learning Objectives

1. Review an installed fire protection system for compliance, and identify, document, and report deficiencies

### Discussion Questions

1. When reviewing an installed fire protection system for compliance, what system components should be identified and documented?

### Activities

1. To be determined by the instructor.

### Instructor Notes

1. This topic may be taught in conjunction with Topic 3-1: Reviewing Proposed Installation of Fire Protection Systems.

**CTS Guide Reference:** CTS 4-4

### Topic 3-3: Witnessing an Acceptance Test for an Integrated Fire Protection System

#### Terminal Learning Objective

At the end of this topic, a student, given approved shop drawings, test protocols, and an installed system, will be able to witness an acceptance test for an integrated fire protection system to evaluate for compliance, and identify, document, and report deficiencies in accordance with applicable codes and standards and jurisdictional policies.

#### Enabling Learning Objectives

1. Describe acceptance test procedures
  - Contractors pre- test documentation
  - Test criteria from codes and standards
  - Other specific test criteria as might be developed by the system designer
2. Identify applicable codes and standards for acceptance testing:
  - Elevator recall upon activation of a fixed fire alarm system
  - Activation and operation of a smoke removal (HVAC) system
  - Other integrated fire protection systems of a similar nature in a structure
3. Supervise the performance of acceptance tests
  - Identify, document, and report deficiencies

#### Discussion Questions

1. What steps are involved in an acceptance test?

#### Activities

1. To be determined by the instructor.

**CTS Guide Reference:** CTS 3-21

## Unit 4: Emergency Access Criteria

### Topic 4-1: Developing Emergency Access Criteria

#### Terminal Learning Objective

At the end of this topic, a student, given the jurisdiction's emergency fire apparatus and fire suppression practices, will be able to develop emergency access criteria to deliver fire suppression services in accordance with jurisdictional policies.

#### Enabling Learning Objectives

1. Discuss emergency access and accessibility requirements of the jurisdiction
2. Describe the performance specifications related to access of emergency vehicles of the jurisdiction
3. Identify emergency access requirements contained in the applicable codes and standards
4. Make decisions as required to develop emergency access criteria
5. Use measuring tools to evaluate emergency fire apparatus for use in planning emergency access criteria

### Discussion Questions

1. When developing emergency access criteria, what types of site accessibility requirements should be considered?
2. What type of emergency access requirements should be developed for buildings under construction?

### Activities

1. To be determined by the instructor.

**CTS Guide Reference:** CTS 3-22

**Time Table**

Segment	Lecture Time	Activity Time	Total Unit Time
<b>Unit 1: Introduction</b>			
Topic 1-1: Orientation and Administration			
Lecture	00:30		
Activity 1-1: To be determined by instructor		00:00	
Topic 1-2: Fire Marshal Certification Process			
Lecture	00:30		
Activity 1-2: To be determined by instructor		00:00	
<b>Unit 1 Totals</b>	<b>1:00</b>	<b>00:00</b>	<b>1:00</b>
<b>Unit 2: Life Safety Systems and Building Services Equipment</b>			
Topic 2-1: Evaluating Fire, Life Safety, and Property Protection Equipment			
Lecture	2:00		
Activity 2-1: To be determined by instructor		00:00	
Topic 2-2: Verifying Code Compliance of Building Service Equipment and Operations			
Lecture	2:00		
Activity 2-2: To be determined by instructor		00:00	
Topic 2-3: Verifying Installation, Inspection, and Testing of Life Safety Systems and Building Services Equipment			
Lecture	2:00		
Activity 2-3: To be determined by instructor		00:00	
Topic 2-4: Evaluating Compliance of Life Safety Systems and Building Services Equipment with Construction Documents			
Lecture	1:00		
Activity 2-4: To be determined by instructor		00:00	
<b>Unit 2 Totals</b>	<b>7:00</b>	<b>00:00</b>	<b>7:00</b>
<b>Unit 3: Fire Protection Systems</b>			

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Segment	Lecture Time	Activity Time	Total Unit Time
Topic 3-1: Reviewing Proposed Installation of Fire Protection Systems			
Lecture	4:00		
Activity 3-1: See suggested activity		00:30	
Topic 3-2: Reviewing Installed Fire Protection Systems			
Lecture	00:30		
Activity 3-2: To be determined by instructor		00:00	
Topic 3-3: Witnessing an Acceptance Test for an Integrated Fire Protection System			
Lecture	1:00		
Activity 3-3: To be determined by instructor		00:00	
<b>Unit 3 Totals</b>	<b>5:30</b>	<b>00:30</b>	<b>6:00</b>
<b>Unit 4: Emergency Access Criteria</b>			
Topic 4-1: Developing Emergency Access Criteria			
Lecture	1:00		
Activity 2-1: To be determined by instructor		00:00	
<b>Unit 4 Totals</b>	<b>1:00</b>	<b>00:00</b>	<b>1:00</b>
<b>Lecture, Activity, and Unit Totals:</b>	<b>14:30</b>	<b>00:30</b>	<b>15:00</b>

### Course Totals

Segment Type	Time
Total Lecture Time (LT)	14:30
Total Activity Time (AT)	00:30
Total Testing Time (TT)	1:00
<b>Total Course Time</b>	<b>16:00</b>