Inspecting New and Existing Fire and Life Safety Systems and Equipment (2024)

Course Plan

Course Details

Certification: Fire Inspector

CTS Guide: Fire Inspector Certification Training Standard Guide (2024)

Description: This course provides students with a basic knowledge of inspection requirements related to the roles and responsibilities of a Fire Inspector including inspection of life safety systems and building services equipment, fire protection systems, and emergency access criteria.

Designed For: Personnel preparing to pursue Fire Inspector certification or anyone who performs the duties of an inspector within their agency

Prerequisites: Fire Inspector 2A: Fire Prevention Administration (2014 or newer)

Standard: Complete all activities and formative tests.

Complete all summative tests with a minimum score of 80%.

Hours (Total): 24 hours

(20 lecture / 2 application / 2 testing)

Maximum Class Size: 30

Instructor Level: SFT Fire Inspector Registered Instructor

Instructor/Student Ratio: 1:30

Restrictions: None

SFT Designation: CFSTES

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Required Resources

Instructor Resources

To teach this course, instructors need:

- One of the following textbooks (including Instructor Resource kit)
  - *Fire Inspection and Code Enforcement* (IFSTA, 9th edition, 2023)
    or
  - *Fire Inspector: Principles and Practice* (Jones & Bartlett, revised enhanced 1st edition, 2016)
- California Building Code (International Code Council, current edition)
- California Code of Regulations (CCR) Title 19 (Office of Administrative Law, current edition)
- California Fire Code (International Code Council, current edition)

Online Instructor Resources

The following instructor resources are available online at https://osfm.fire.ca.gov/what-we-do/state-fire-training/professional-certifications:

- None

Student Resources

To participate in this course, students need:

- Required textbook chosen by the instructor
- California Fire Code (International Code Council, current edition)
- Access to a computer and printer

Facilities, Equipment, and Personnel

Facilities

The following facilities are required to deliver this course:

- Standard learning environment or facility, which may include:
  - Writing board or paper easel chart
  - Markers, erasers
  - Amplification devices
  - Projector and screen
  - Laptop or tablet with presentation or other viewing software
  - Internet access with appropriate broadband capabilities

Time Table

Segment	Lecture	Application	Unit Total
Unit 1: Introduction			
Topic 1-1: Orientation and Administration	0.50	0.00	
Topic 1-2: Fire Inspector Certification Process	0.50	0.00	
Unit 1 Totals	**1.00**	**0.00**	**1.00**
Unit 2: Life Safety Systems and Building Services Equipment			
Topic 2-1: Evaluating Fire, Life Safety, and Property Protection Equipment	2.50	0.00	
Topic 2-2: Verifying Code Compliance of Building Service Equipment and Operations	2.50	0.00	
Topic 2-3: Verifying Emergency Access for an Existing Site	0.50	0.00	
Topic 2-4: Verifying Available Fire Flows for a Site	2.50	0.00	
Topic 2-5: Verifying Compliance with Construction Documents	2.00	0.00	
Unit 2 Totals	**10.00**	**0.00**	**10.00**
Unit 3: Fire Protection Systems			
Topic 3-1: Reviewing Proposed Installation of Fire Protection Systems	6.00	0.00	
Topic 3-2: Witnessing Integrated Fire Protection Systems	2.00	2.00	
Topic 3-3: Comparing an Approved Plan to an Existing Fire Protection System	1.00	0.00	
Unit 3 Totals	**9.00**	**2.00**	**11.00**
Formative Assessments			
Determined by AHJ or educational institution	**0.00**	**0.00**	**0.00**
Summative Assessment			
Determined by AHJ or educational institution	**0.00**	**2.00**	**2.00**
Course Totals	**20.00**	**4.00**	**24.00**

Time Table Key

1. The Time Table documents the amount of time estimated to deliver the content included in the course plan.

2. Time is documented using the quarter system: 15 min. = .25 / 30 min. = .50 / 45 min. = .75 / 60 min. = 1.0.

3. The Course Totals do not reflect time for lunch (1 hour) or breaks (10 minutes per each 50 minutes of instruction or assessment). It is the instructor's responsibility to add this time based on the course delivery schedule.

4. Application (activities, skills exercises, and formative testing) time will vary depending on the number of students enrolled. The Application time documented is based on the maximum class size identified in the Course Details section.

5. Summative Assessments are determined and scheduled by the authority having jurisdiction. These are not the written or psychomotor State Fire Training certification exams. These are in-class assessments to evaluate student progress and calculate course grades.

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, skills exercises, 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. Determined by instructor

Application

1. Determined by instructor

Topic 1-2: Fire Inspector Certification Process

Terminal Learning Objective

At the end of this topic a student will be able to identify the requirements for Fire Inspector certification and describe the certification task book and testing process.

Enabling Learning Objectives

1. Identify the levels of certification in the Fire Inspector certification track
   - First Responder Inspector
   - Fire Inspector
2. Identify other Fire Prevention certification tracks
   - Fire Plans Examiner
   - Fire Marshal
3. Identify the prerequisites for Fire Inspector certification
   - OSFM Fire Inspector 1 (2014) **or** First Responder Inspector (2024) certification
4. Identify the course work required for Fire Inspector certification
   - Fire Inspector 2A: Fire Prevention Administration (2014 or newer)
   - Fire Inspector 2B: Fire and Life Safety Requirements (2014 or newer)
   - Fire Inspector 2C: Fire and Life Safety Systems and Equipment Inspections (2014 or newer)
   - Fire Inspector 2D: Hazardous Materials, Operations, and Processes (2014 or newer)
   - Statutes and Regulations (SFT – Completed within the last 10 years)
   - Fire and Life Safety Educator 1A: Fire and Life Safety Educator 1
5. Identify the exam requirements for Fire Inspector certification
   - None
6. Identify the task book requirements for Fire Inspector certification
   - Fire Inspector Certification Task Book (2024)
7. Identify the experience requirements for Fire Inspector certification
   - Has a minimum of three (3) years' full-time paid experience or six (6) years' volunteer or part-time paid experience in a recognized California fire agency as a Fire Inspector or Prevention Officer
8. Identify the position requirements for Fire Inspector 1 certification
   - None
9. Identify the supporting documentation requirements for Fire Inspector certification
   - International Code Council Fire Code Inspector 1 certification
10. Describe the certification task book process
11. Describe the certification testing process
    - Not applicable
    - All formative and summative testing is completed in individual courses

Discussion Questions

1. Determined by instructor

Application

1. Determined by 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 topic a student, given field observations and hazard classifications of the facility and documentation, the hazards protected, and the system specifications, will be able to evaluate fire protection systems and equipment provided for life safety and property protection so that the fire protection systems provided are approved for the occupancy, commodity, or hazard being protected.

Enabling Learning Objectives

1. Identify applicable codes, standards, and ordinances for fire protection systems
2. Identify types and classifications of commodities relative to fuel load and fire behavior
3. Describe basic physical science as it relates to fire behavior and fire suppression
4. Explain implications and hazards associated with system operation
5. Identify hazard classifications as they pertain to a building's uses and/or potential commodities
    - California Code of Regulations (CCR) Title 19 (Public Safety)
6. Describe installation techniques and acceptance inspection
7. Describe testing and reports of maintenance of completed installations
    - Cloud-based record-management systems
8. Describe the use and function of various systems
9. Recognize hazards and deficiencies with fire protection systems, equipment, and commodities
10. Use codes and standards to evaluate fire protection systems and equipment
11. 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 are the key elements of an acceptance inspection?
2. Can an alternative automatic fire extinguishing system be utilized in lieu of fire sprinkler protection?
3. Under what circumstances may fire sprinklers be omitted in a fully sprinklered building?

Application

1. Determined by 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 4-4

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 so that the systems and other equipment are maintained in accordance with applicable codes, standards, and operations and deficiencies are identified, documented, and reported in accordance with AHJ 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
   - Escalators
4. Identify emerging technologies
5. Identify energy efficiency systems
6. Identify applicable AHJ codes and standards
7. Describe how to coordinate with other agencies within the AHJ that have expertise in mechanical equipment to provide a uniform approach to achieve a fire-safe environment
8. Observe and recognize deficiencies with HVAC and other building service equipment and operations
9. Interpret codes and standards related to building service equipment
10. 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?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 4-14

Topic 2-3: Verifying Emergency Access for an Existing Site

Terminal Learning Objective

At the end of this topic a student, given field observations and approved plans, will be able to verify emergency access for an existing site so that the required access for emergency responders is maintained and deficiencies are identified, documented, and corrected in accordance with the applicable AHJ policies.

Enabling Learning Objectives

1. Describe AHJ policies
2. Describe emergency access and accessibility requirements
   - Minimum vertical clearance
   - Access to fire protection equipment
   - Approach and departure angles
   - Slope
3. Explain impact of inadequate emergency access on response times and public safety
4. Observe and report deficiencies per AHJ policies
5. Describe AHJ enforcement actions
6. Identify alternative methods for providing access based on requirements of responding personnel
7. Implement emergency access requirements

Discussion Questions

1. What types of operational permits and events might impact emergency access?
2. In an area with automatic aid, should all the jurisdictions adopt similar or identical red curb and signage requirements? Why or why not?
3. What are correction paths to ensure emergency access is provided?

Application

1. Determined by instructor

Instructor Note

1. None

CTS Guide Reference: CTS 4-15

Topic 2-4: Verifying Available Fire Flows for a Site

Terminal Learning Objective

At the end of this topic a student, given fire flow test results and water supply data, will be able to verify available fire flows for a site so that required fire flows are in accordance with applicable codes, standards, and ordinances, and codes and deficiencies are identified, documented, and reported in accordance with the applicable codes, standards, and ordinances, and AHJ policies.

Enabling Learning Objectives

1. Define fire flow
2. Distinguish between fire flow and water flow
3. Identify applicable codes, standards, and ordinances and AHJ policies
4. Identify types of water distribution systems and other water sources in the local community
5. Describe water distribution system testing
6. Describe characteristics of public and private water supply systems
7. Describe flow testing procedures
8. Use Pitot tubes, gauges, and other data gathering devices
9. Graph and evaluate fire flow results
10. Calculate required fire flow

Discussion Questions

1. How much credit do you give fire sprinklers in the reduction of fire flow, per your AHJ?
2. Under what circumstances should a fire flow be required?
3. Does water flow data expire?

Application

1. Determined by instructor

Instructor Note

1. None

CTS Guide Reference: CTS 4-16

Topic 2-5: Verifying Compliance with Construction Documents

Terminal Learning Objective

At the end of this topic a student, given a performance-based design, will be able to verify compliance with construction documents so 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, so that deficiencies are identified, documented, and reported in accordance with the applicable codes, standards, and ordinances and AHJ policies.

Enabling Learning Objectives

1. Define prescriptive- and performance-based design
2. Describe examples of performance-based design
   - Smoke control system
3. Identify conditions or situations that would trigger or result in the need for performance-based design
4. Describe applicable codes, standards, and ordinances for installing and testing fire protection systems
5. Describe how to verify that means of egress are installed, inspected, and tested to perform as designed
6. Describe how to verify that building services equipment is installed, inspected, and tested to perform as designed
7. Recognize and evaluate performance-based design in the field
8. Witness and validate tests of fire protection systems and building services equipment
   - Identify, document, and report deficiencies

Discussion Questions

1. When do you seek professional assistance when reviewing performance-based design?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 4-13

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 storage commodity, process, or operation, will be able to review the proposed installation of fire protection systems so that the system is reviewed for code compliance and installed in accordance with the approved drawings, and deficiencies are identified, documented, and reported in accordance with the applicable codes, standards, and ordinances and AHJ policies.

Enabling Learning Objectives

1. Describe proper selection, distribution, location, and testing of portable fire extinguishers
2. Identify methods used to evaluate the operational readiness of water supply systems used for fire protection
3. Describe evaluating and testing automatic sprinkler, water spray, and standpipe systems and fire pumps
   - Shop drawings
   - Storage commodity
   - Moderately technical applications
   - Compatibility and effectiveness of protection systems and equipment with hazard to be protected
4. Describe evaluation and testing of fixed fire suppression systems
5. Describe evaluation and testing of automatic fire detection and alarm systems and devices
6. Read basic floor plans or shop drawings
7. Identify symbols recognized by the AHJ

Discussion Questions

1. How do storage commodities affect requirements for sprinkler systems?

Application

1. Determined by instructor

Instructor Notes

1. None

CTS Guide Reference: CTS 5-3

Topic 3-2: Witnessing Integrated Fire Protection System Testing

Terminal Learning Objective

At the end of this topic a student, given approved shop drawings, integrated system test plan, and installed systems, will be able to witness integrated fire protection system testing so that the integrated system performance can be evaluated for compliance, and deficiencies are identified, documented, reported, and resolved in accordance with the applicable codes, standards, and ordinances and AHJ policies.

Enabling Learning Objectives

1. Define integrated system testing terms
    - Acceptance test
    - Basis of design
    - Commissioning
    - Integrated tests
    - Integrated testing agent
    - Interface/interface device
    - Owner's project requirements
    - Sequence of operation
    - Integrated system
    - Systems connections
2. Identify applicable codes and standards
3. Identify general requirements of integrated system testing
    - Integrated testing team
    - Responsibilities
    - Testing plan
4. Describe test methods used in integrated system testing
    - Testing agent responsibilities
    - Risk assessment
    - Risk mitigation
    - End-to-end integrated systems testing
    - Test verification
    - Peripherally connected devices
        - Shunt trip
        - Building management system
5. Describe test scenarios
    - Test scenario documentation
6. Describe testing frequencies for integrated system testing
    - Initial
    - Periodic
    - Existing/Modification
7. Describe documentation methods for integrated system testing
    - Application
    - Minimum required documentation

- Completion documents
- Record retention
- Record maintenance

8. Review, evaluate, and follow an integrated test plan
9. Describe acceptance test procedures
10. Witness and validate the performance of acceptance tests

Discussion Questions

1. How does an integrated systems test plan differ from an acceptance test?
2. Who needs to be involved in developing an integrated systems test plan?

Application

1. Given a type of building, have students work in groups of five to role play the development of an integrated systems testing plan.
    - Each student should take on one of the following roles: building owner, contractor, fire inspector, fire alarm contractor, and fire protection engineer.

Instructor Note

1. Find Application scenarios in the Annex of NFPA 4.
2. ELOs 9 and 10 are NFPA 1030 requirements. Address them in the context of California requirements (NFPA 4).

CTS Guide Reference: CTS 4-5

Topic 3-3: Comparing an Approved Plan to an Existing Fire Protection System

Terminal Learning Objective

At the end of this topic a student, given approved plans and field observations, will be able to compare an approved plan to an existing fire protection system so that any modifications to the system are identified, documented, and reported in accordance with the applicable codes, standards, and ordinances and AHJ policies.

Enabling Learning Objectives

1. Identify fire protection symbols and terminology
2. Compare existing plans to new or revised plans and identify changes
3. Read and comprehend plans for fire protection systems
4. Observe changes in the field
5. Recognize, document, and communicate deficiencies
6. Apply codes, standards, and ordinances
7. Make appropriate decisions

Discussion Questions

1. When are systems modifications, revisions, or as-builts required to be submitted for review and approval?

Application

1. Determined by instructor.

Instructor Note

1. None

CTS Guide Reference: CTS 5-4

How to Read a Course Plan

A course plan identifies the details, logistics, resources, and training and education content for an individual course. Whenever possible, course content is directly tied to a national or state standard. SFT uses the course plan as the training and education standard for an individual course. Individuals at fire agencies, academies, and community colleges use course plans to obtain their institution's consent to offer course and provide credit for their completion. Instructors use course plans to develop syllabi and lesson plans for course delivery.

Course Details
The Course Details segment identifies the logistical information required for planning, scheduling, and delivering a course.

Required Resources
The Required Resources segment identifies the resources, equipment, facilities, and personnel required to deliver the course.

Unit
Each Unit represents a collection of aligned topics. Unit 1 is the same for all SFT courses. An instructor is not required to repeat Unit 1 when teaching multiple courses within a single instructional period or academy.

Topics
Each Topic documents a single Terminal Learning Objective and the instructional activities that support it.

Terminal Learning Objective
A Terminal Learning Objective (TLO) states the instructor's expectations of student performance at the end of a specific lesson or unit. Each TLO includes a task (what the student must be able to do), a condition (the setting and supplies needed), and a standard (how well or to whose specifications the task must be performed). TLOs target the performance required when students are evaluated, not what they will do as part of the course.

Enabling Learning Objectives
The Enabling Learning Objectives (ELO) specify a detailed sequence of student activities that make up the instructional content of a lesson plan. ELOs cover the cognitive, affective, and psychomotor skills students must master to complete the TLO.

Discussion Questions
The Discussion Questions are designed to guide students into a topic or to enhance their understanding of a topic. Instructors may add to or adjust the questions to suit their students.

Application
The Application segment documents experiences that enable students to apply lecture content through cognitive and psychomotor activities, skills exercises, and formative testing. Application experiences included in the course plan are required. Instructors may add additional application experiences to suit their student population if time permits.

Instructor Notes
The Instructor Notes segment documents suggestions and resources to enhance an instructor's ability to teach a specific topic.

CTS Guide Reference
The CTS Guide Reference segment documents the standard(s) from the corresponding Certification Training Standard Guide upon which each topic within the course is based. This segment is eliminated if the course is not based on a standard.

Skill Sheet
The Skill Sheet segment documents the skill sheet that tests the content contained within the topic. This segment is eliminated if the course does not have skill sheets.