



# COURSE INFORMATION AND REQUIRED MATERIALS

**Course:** Fire Inspector 2C: Inspecting New and Existing Fire and Life Safety Systems and Equipment (2011) CFSTES

**Hours:** 32:00 (30:00 instruction/2:00 testing)

**Designed For:** The certified Fire Inspector I advancing to the Fire Inspector II classification

**Description:** Upon completion of this course, the student will be familiar with the basic plan review process; evaluating fire and life safety features in new buildings including water-based and fixed fire suppression (special agent) systems, fire detection and alarm systems, portable fire extinguishers, and HVAC and other building service equipment; and evaluating fire and life safety features in existing buildings including water-based and special agent fire suppression systems, and fire detection and alarm systems.

**Prerequisites:** Fire Inspector 2A: Fire Prevention Administration

**Certification:** 80%

**Standard:** Fire Inspector II

**Class Size:** 30

**Restrictions:** None

REQUIRED STUDENT MATERIALS	EDITION	PUBLISHER
▪ California Building Code	Current	ICC
▪ California Fire Code	Current	ICC
▪ Fire Inspection and Code Enforcement	Seventh	FPP
REQUIRED INSTRUCTOR MATERIALS		
▪ California Building Code	Current	ICC
▪ California Fire Code	Current	ICC
▪ California Code of Regulations (CCR) Title 19	Current	OAL or Barclays
▪ Inspection and Code Enforcement Instructor Resource Kit	Seventh	FPP

PUBLISHER CONTACT INFORMATION		
Barclays	Barclays	<a href="http://www.west.thompson.com">www.west.thompson.com</a>
FPP	Fire Protection Publications	<a href="http://www.ifsta.org">www.ifsta.org</a>
ICC	International Code Council	<a href="http://www.iccsafe.org/STORE/Pages/default.aspx">http://www.iccsafe.org/STORE/Pages/default.aspx</a>
OAL	Office of Administrative Law	<a href="http://www.oal.ca.gov/publications.htm">www.oal.ca.gov/publications.htm</a>

## FIRE INSPECTOR 2C COURSE PLAN

Course Objectives: to provide the student with...

- a) An introduction to the basic plan review process
- b) Information about evaluating fire and life safety features in new buildings including water-based and fixed fire suppression (special agent) systems, fire detection and alarm systems, portable fire extinguishers, and HVAC and other building service equipment
- c) Information about evaluating fire and life safety features in existing buildings including water-based and special agent fire suppression systems, and fire detection and alarm systems

Course Content ..... 30:00

### Unit 1: Introduction

Topic 1-1: Orientation and Administration ..... 0:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify the classroom and facility requirements along the with the course completion requirements.

Enabling Learning Objectives (ELO):

1. Identify facility and classroom requirements
  - Start and end times
  - Breaks



# COURSE INFORMATION AND REQUIRED MATERIALS

## FIRE INSPECTOR 2C COURSE PLAN

- Restrooms
  - Food locations
  - Smoking locations
  - Emergency procedures
  - Electronic devices
  - Special needs and accommodations
  - Other requirements
2. Review the course syllabus
- Course objectives
  - Calendar of events
  - Course requirements
  - Student evaluation process (80% is required on all summative tests)
  - Assignments and activities
  - Required student resources
  - Class participation requirements

### Discussion Questions

1. What are formative and summative tests?

### Activities

1. To be determined by the instructor

### Unit 2: Basic Plan Review

Topic 2-1: Basic Plan Review Process..... 4:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify standard symbols used in plans and describe the plan review process, types of plan views and system plans, and the systematic plan review process.

### Enabling Learning Objectives (ELO):

1. Describe the plan review process
2. Identify standard symbols used in plans
3. Describe types of plan views and system plans, including:
  - Site plan
  - Floor plan
  - Elevation
  - Sectional
  - Detailed
  - System plan
    - Mechanical
    - Electrical
    - Plumbing
    - Sprinkler
    - Standpipe and hose systems
    - Fixed fire suppression (special agent) systems
    - Fire detection and alarm systems
4. Describe the systematic plan review process
  - Building size
  - Occupancy classification
  - Occupant load
  - Means of egress
  - Exit capacity
  - Building compartmentation
  - Additional concerns



# COURSE INFORMATION AND REQUIRED MATERIALS

## FIRE INSPECTOR 2C COURSE PLAN

### Discussion Questions

1. What are the different types of plan views?

### Activities

1. Using a set of plans, identify each plan view and its purpose.
2. Using a set of plans, identify the occupancy classification, occupant load, and means of egress for a building.

### Topic 2-2: Evaluating Fire and Life Safety Systems and Equipment on a Set of Plans ..... 2:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to use a set of plans to verify the proper selection, distribution, and location of portable fire extinguishers; evaluate the operational readiness of water supply systems; and evaluate automatic sprinkler, water spray, standpipe systems, fire pumps, fixed fire suppression systems, and automatic fire detection and alarm systems and devices.

### Enabling Learning Objectives (ELO):

1. Describe how to verify the proper selection, distribution, and location of portable fire extinguishers on a set of plans
2. Describe how to evaluate automatic sprinkler, water spray, and standpipe systems and fire pumps on a set of plans
3. Describe how to evaluate fixed fire suppression systems on a set of plans
4. Describe how to evaluate automatic fire detection and alarm systems and devices on a set of plans

### Discussion Questions

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

### Activities

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

Evaluation: Formative Test, Summative Test

### Unit 3: Fire and Life Safety Systems and Equipment in New Buildings

### Topic 1: Installation of a New Water-Based Fire Protection System ..... 6:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe codes and standards for a water-based extinguishing system; observe and verify field conditions to ensure proper installation; and evaluate and test new water-based fire protection systems.

### Enabling Learning Objectives (ELO):

1. Describe how to evaluate the operational readiness of water supply systems used for fire protection
2. Describe codes and standards for installing and testing a water-based extinguishing system, including:
  - Automatic sprinkler systems
    - Commercial
    - Residential
  - Standpipes
  - Fire pumps
  - Water spray systems
  - Water mist systems
  - Foam-water systems
  - Underground fire service mains
3. Describe the field conditions that must be observed and verified to ensure the proper installation of a water-based fire extinguishing system, including:
  - Installation techniques
    - Hangers and bracing
    - Fittings, valves and connections
    - Head spacing



# COURSE INFORMATION AND REQUIRED MATERIALS

## FIRE INSPECTOR 2C COURSE PLAN

- Flushing
- Hydrostatic testing
- Performance-based design
- Manufacturer specifications
- Commissioning and acceptance test of completed installations
  - NFPA 13
  - NFPA 14
  - NFPA 20
  - NFPA 24

4. Describe how to evaluate and test water-based fire protection systems

Discussion Questions

1. What are the differences between NFPA 13, 13D and 13R automatic sprinkler systems?

Activities

1. To be determined by instructor.

Evaluation: Formative Test, Summative Test

Topic 2-2: Installation of a New Fixed Fire Suppression (Special Agent) System..... 4:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe codes and standards for a fixed fire (special agent) system; observe and verify field conditions to ensure proper installation; and evaluate and test fixed fire (special agent) suppression systems.

Enabling Learning Objectives (ELO):

1. Describe codes and standards for installing and testing a fixed fire suppression (special agent) system, including:
  - Dry chemical
  - Wet chemical
  - Clean agent
  - CO<sub>2</sub> systems
  - Foam systems
2. Describe the field conditions that must be observed and verified to ensure the proper installation of a special agent system, including:
  - Installation techniques
  - Performance-based design
  - Manufacturer specifications
  - Commissioning and acceptance test of completed installations
3. Describe how to evaluate and test fixed fire suppression (special agent) systems

Discussion Questions

1. What type of hazard would require a UL 300 system?
2. What type of hazard would require a dry chemical system?
3. Where would you find a clean agent system?

Activities

1. To be determined by instructor.

Topic 2-3: Installation of a New Fire Detection and Alarm System..... 4:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe codes and standards for, and the components of, fire detection and alarm systems; observe and verify field conditions to ensure proper installation; and evaluate and test automatic fire detection and alarm systems and devices.

Enabling Learning Objectives (ELO):

1. Describe codes and standards for installing and testing a fire detection and alarm system



# COURSE INFORMATION AND REQUIRED MATERIALS

## FIRE INSPECTOR 2C COURSE PLAN

2. Describe the field conditions that must be observed and verified to ensure the proper installation of a fire detection and alarm system, including:
  - Installer qualifications
  - Installation techniques
  - Performance-based design
  - Manufacturer specifications
  - Commissioning and acceptance test inspection of completed installations
3. Describe how to evaluate and test automatic fire detection and alarm systems and devices

### Discussion Questions

1. In a mixed-use occupancy, do all of the occupancies require a fire alarm system?

### Activities

1. To be determined by instructor.

### Topic 2-4: Installation of Portable Fire Extinguishers and HVAC and Other Building Service Equipment ..... 2:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to verify the proper selection, distribution, and location of portable fire extinguishers; describe types, installation, maintenance, and use of HVAC and other building service equipment, and how to operate smoke and heat vents; evaluate the installation of kitchen cooking equipment, laundry chutes, elevators, and escalators; and observe and verify field conditions to ensure proper installation of HVAC and other building service equipment.

### Enabling Learning Objectives (ELO):

1. Describe how to verify the proper selection, distribution, and location of portable fire extinguishers
2. Describe types, installation, maintenance, and use of HVAC and other building service equipment
3. Describe the operation of smoke and heat vents
4. Describe how to evaluate the installation of kitchen cooking equipment (including hoods and ducts), laundry chutes, elevators, and escalators
5. Describe the field conditions that must be observed and verified to ensure the proper installation of HVAC and other building service equipment, including:
  - Installation techniques
  - Performance-based design
  - Manufacturer specifications
  - Commissioning and acceptance test of completed installations

### Discussion Questions

1. How is an HVAC system utilized for fire control?

### Activities

1. To be determined by instructor.

### Topic 2-5: Deficiency Verification and Resolution ..... 1:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to verify and resolve deficiencies related to new fire protection systems and equipment.

### Enabling Learning Objectives (ELO):

1. Describe how deficiencies are verified, including:
  - Observation, analysis and documentation
  - Reporting in accordance with the policies of the jurisdiction
2. Describe the procedures for resolving deficiencies, including:
  - Taking appropriate action based on the findings to gain code compliance
  - Referring to appropriate level when necessary

### Discussion Questions

1. Can an inspector issue a temporary use clearance if a fire alarm system does not successfully comply with all of the components of a commissioning test?



# COURSE INFORMATION AND REQUIRED MATERIALS

## FIRE INSPECTOR 2C COURSE PLAN

### Activities

1. To be determined by instructor.

### Unit 4: Fire and Life Safety Systems and Equipment in Existing Buildings

#### Topic 4-1: Evaluating Fire and Life Safety Systems and Equipment..... 2:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to evaluate fire and life safety systems and equipment and observe and verify field conditions to evaluate existing fire and life safety systems and equipment

#### Enabling Learning Objectives (ELO):

1. Describe how to evaluate fire and life safety systems and equipment, including:
  - Approved for occupancy or hazard being protected
  - Appropriate equipment in the appropriate location for hazard
  - Properly maintained
2. Describe the field conditions that must be observed and verified to evaluate existing fire and life safety systems and equipment, including:
  - Unobstructed devices
  - Documentation of required testing
  - Damaged assemblies and equipment

#### Discussion Questions

1. How would you evaluate an existing assembly?
2. How would you evaluate a change in use?

#### Activities

1. Given images of non-compliant features, work in small groups to identify the problems with each.

#### Topic 4-2: Water-Based Fire Suppression Systems ..... 1:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe installation techniques and acceptance inspections and the implications and hazards associated with system operation; inspect an existing water-based fire suppression system and equipment; verify that systems and equipment comply with construction documents; and verify and resolve deficiencies.

#### Enabling Learning Objectives (ELO):

1. Describe installation techniques and acceptance inspections
2. Describe the implications and hazards associated with system operation
3. Describe how to inspect existing water-based fire suppression systems and equipment to comply with applicable codes and standards, including:
  - Automatic sprinkler systems
  - Water spray fixed systems
  - Water mist systems
  - Foam water systems
  - Standpipe and hose systems
  - Fire pumps
4. Describe how to verify that systems and equipment comply with construction documents, including:
  - Applying applicable codes and standards
    - NFPA 25 as adopted and amended by California
    - CCR Title 19
    - CFC, chapter 9, sections 9.03 and 9.05
  - Ensuring life safety systems and building services equipment are installed, inspected, and tested to perform as described in the operations and maintenance manuals
5. Describe how to verify and resolve deficiencies, including:
  - Observation and documentation
  - Reporting in accordance with jurisdictional policies



# COURSE INFORMATION AND REQUIRED MATERIALS

## FIRE INSPECTOR 2C COURSE PLAN

- Taking appropriate action to gain code compliance
- Referring to the appropriate level when necessary

### Discussion Questions

1. What are common deficiencies found during inspections of existing water-based fire suppression systems?
2. What would you do if you found an inoperative system in an occupied building?

### Activities

1. To be determined by instructor.

### Topic 4-3: Fixed Fire Suppression (Special Agent) Systems ..... 1:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe installation techniques and acceptance inspections and the implications and hazards associated with system operation; verify that fixed fire suppression (special agent) systems and equipment comply with codes and standards and construction documents; and verify and resolve deficiencies.

#### Enabling Learning Objectives (ELO):

1. Describe installation techniques and acceptance inspections
2. Describe the implications and hazards associated with system operation
3. Describe how to verify that fixed fire suppression (special agent) systems and equipment comply with applicable codes and standards, including:
  - Dry chemical
  - Wet chemical
  - Clean agent
  - Foam
4. Describe how to verify that systems and equipment comply with construction documents, including:
  - Applying applicable codes and standards
    - CCR, Title 19, section 904
    - CFC, chapter 9, sections 9.04
  - Ensuring life safety systems and building services equipment are installed, inspected and tested to perform as described in the operations and maintenance manuals
5. Describe how to verify and resolve deficiencies, including:
  - Observation and documentation
  - Reporting in accordance with jurisdictional policies
  - Taking appropriate action to gain code compliance
  - Referring to the appropriate level when necessary

### Discussion Questions

1. What are common deficiencies found during inspections of existing fixed fire suppression (special agent) systems?
2. In a commercial kitchen, what impact would reconfiguring the cooking equipment have on the suppression system?

### Activities

1. To be determined by instructor.

### Topic 4-4: Fire Detection and Alarm Systems ..... 2:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe installation techniques and acceptance inspections and the implications and hazards associated with system operation; inspect fire detection and alarm systems and equipment to ensure compliance with codes and standards and construction documents; verify that systems and equipment comply with construction documents; and verify and resolve deficiencies.

#### Enabling Learning Objectives (ELO):

1. Describe installation techniques and acceptance inspections
2. Describe the implications and hazards associated with system operation



# COURSE INFORMATION AND REQUIRED MATERIALS

## FIRE INSPECTOR 2C COURSE PLAN

3. Describe how to inspect fire detection and alarm systems and equipment to comply with applicable codes and standards, including:
  - Automatic alarm initiating devices
  - Manual alarm initiating devices
  - Alarm notification devices
4. Describe how to verify that systems and equipment comply with construction documents, including:
  - Applying applicable codes and standards
    - NFPA 72
    - CCR, Title 19, division 1, chapter 4
    - CFC, chapter 9, section 9.07
  - Ensuring life safety systems and building services equipment are installed, inspected and tested to perform as described in the operations and maintenance manuals
5. Describe how to verify and resolve deficiencies, including:
  - Observation and documentation
  - Reporting in accordance with jurisdictional policies
  - Taking appropriate action to gain code compliance
  - Referring to the appropriate level when necessary

### Discussion Questions

1. What are common deficiencies found during inspections of existing fire detection and alarm systems?
2. What action would you take if the fire alarm system was found to be inoperable?

### Activities

1. To be determined by instructor.

Summative Testing.....	1:00
Formative Testing .....	2:00