



COURSE INFORMATION AND REQUIRED MATERIALS

Course: Fire Inspector 1B: Introduction to Fire and Life Safety (2011) CFSTES
Hours: 32:00 (29:00 instruction/3:00 testing)
Designed For: The entry-level fire inspector
Description: Upon completion of this course the student will have a basic knowledge of construction types and features, occupancy classifications and occupant loads, basic means of egress, fire growth potential in a building or space, fire department access and water supply, and fire potential in the wildland urban interface environment.
Prerequisites: Fire Inspector 1A: The Role of the Fire Inspector
Certification: 80%
Standard: Fire Inspector I
Class Size: 30
Restrictions: None

REQUIRED STUDENT MATERIALS		EDITION	PUBLISHER
▪ California Fire Code		Current	ICC
▪ Fire Inspection and Code Enforcement		Seventh	FPP
▪ Fire Inspector 1B information sheets		Current	SFT
REQUIRED INSTRUCTOR MATERIALS			
▪ California Building Code		Current	ICC
▪ California Fire Code (w/ Title 19 excerpts)		Current	ICC
▪ California Code of Regulations (CCR) Title 19		Current	OAL or Barclays
▪ Inspection and Code Enforcement Instructor Resource Kit		Seventh	FPP
▪ Fire Inspector 1B instructor and student materials		Current	SFT

PUBLISHER CONTACT INFORMATION		
Barclays	Barclays	www.west.thompson.com
ICC	International Code Council	http://www.iccsafe.org/STORE/Pages/default.aspx
FPP	Fire Protection Publications	www.ifsta.org
OAL	Office of Administrative Law	www.oal.ca.gov/publications.htm
SFT	State Fire Training Instructor's Corner	http://osfm.fire.ca.gov/training/instructorscorner.php

FIRE INSPECTOR 1B COURSE PLAN

- Course Objectives: to provide the student with:
- An introduction to construction types and features
 - An introduction to occupancy classifications and occupant loads
 - An introduction to basic means of egress
 - An introduction to fire growth potential in a building or space
 - An introduction to fire department access and water supply
 - An introduction to fire potential in the wildland urban interface environment

Course Content 29:00

Unit 1: Introduction

Topic 1-1: Orientation and Administration 00:30

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

Enabling Learning Objectives (ELO):

- Identify facility and classroom requirements
 - Start and end times
 - Breaks
 - Bathrooms
 - Facility evacuation requirements
 - Other requirements



COURSE INFORMATION AND REQUIRED MATERIALS

FIRE INSPECTOR 1B COURSE PLAN

2. Identify the course completion requirements for Fire Inspector 1A: The Role of the Fire Inspector
 - 80% is required on all formative and summative tests
 - Reading assignments
 - Completion of class activities

Discussion Questions

1. What are formative and summative tests?

Activities

1. To be determined by the instructor

Unit 2: Construction Types and Features

Topic 2-1: Construction Features 3:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe the basic features of construction components.

Enabling Learning Objectives (ELO):

1. Describe the basic features of the following construction components, including:
 - Foundations
 - Exterior walls
 - Floor and ceiling assemblies
 - Roof covering and assembly classifications
 - Fire barriers
 - Fire partitions
 - Fire walls
 - Fire-resistant joint systems
 - Enclosed stairs
 - Horizontal assemblies (exit corridors, horizontal exits, rated, unrated)
 - Opening protection
 - Penetration protection
 - Shaft enclosures
 - Smoke barriers
 - Smoke partitions
 - Draft stops
 - Attic stops
 - Interior finishes
 - Fire sprinkler systems (impacts other features)

Discussion Questions

1. What is the purpose of a draft stop?
2. What are the components of a fire-resistance-rated wall?
3. What is the purpose of a parapet?

Activities

1. To be determined by instructor.

Topic 2-2: Construction Types 1:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify types of construction and confirm that construction methods comply with code requirements.

Enabling Learning Objectives (ELO):

1. Identify construction types (methods and materials), including:
 - Type I (A and B) – CBC, chapter 6, table 601; IFSTA, p. 124 (7th ed.), table 4.1
 - Type II (A and B) – CBC, chapter 6, section 602.2 and table 601; IFSTA, p. 124 (7th ed.), table 4.1
 - Type III (A and B) – CBC, chapter 6, section 602.3; IFSTA, p. 124 (7th ed.), table 4.1
 - Type IV – Heavy Timber - CBC, chapter 6, section 602.4; IFSTA, p. 124 (7th ed.), table 4.1
 - Type V (A and B) – Wood Frame – CBC, chapter 6, section 602.5; IFSTA, p. 124 (7th ed.), table 4.1



FIRE INSPECTOR 1B COURSE PLAN

2. Describe how to identify construction type in additions and remodels and how to confirm that construction methods comply with code requirements

Discussion Questions

1. What are the different types of construction?
2. What type of construction does the code approve for hospitals?

Activities

1. Activity 2-2: Construction Types

Unit 3: Occupancy Classifications and Occupant Loads

Topic 3-1: Occupancy Classifications 3:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify how a building official determines occupancy classifications; applicable codes, regulations and standards; fire or life safety hazards presented by various occupancies; occupant load factors for all uses and occupancies; operational features that change the occupancy classification; state-regulated occupancy classifications; and describe how the classifications and uses of a building can be distinct and different within a single building.

Enabling Learning Objectives (ELO):

1. Identify how a building official determines occupancy classifications
2. Identify the applicable codes, regulations and standards
3. Identify fire or life safety hazards presented by various occupancies
4. Identify occupant load factors for all uses and occupancies
5. Identify operational features that change the occupancy classification
6. Identify state-regulated occupancy classifications
7. Describe how the classifications and uses of a building can be distinct and different within a single building, including:
 - Mixed-use
 - Single-use

Discussion Questions

1. What is the difference between gross and net square footage?
2. Who determines occupant classifications and occupant loads?
3. What occupant load factors are used for assembly uses?
4. What is a mixed-use occupancy?

Activities

1. Fill-in-the-blank occupancy classification identification.

Topic 3-2: Calculating Occupant Load 2:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify the function of an area; identify the correct occupant load factor based on function; describe how to determine square footage; and identify various measuring tools used to calculate occupant load.

Enabling Learning Objectives (ELO):

1. Identify the function of the area to be evaluated
2. Identify the correct occupant load factor based on function using Table 1004.1.1 – Maximum Floor Area Allowances Per Occupant (CFC or CBC)
3. Describe how to determine square footage, including:
 - Gross square footage: the inside dimension of the exterior walls of a building
 - Net square footage: the actual occupied area excluding shafts, unoccupied areas, stairways, etc. (See CBC Chapter 10 definitions)
4. Identify the use of and various measuring tools used to calculate occupant load, including:
 - Plans and scales
 - Field measuring devices
 - Ceiling tiles
 - Floor tiles

Discussion Questions

1. What are the purposes and uses of a building's occupant load?



FIRE INSPECTOR 1B COURSE PLAN

2. When does the code require the posting of an occupant load?
Activities
(Instructor to develop)
1. Given several scenarios, determine the occupancy and occupant load.

Unit 4: Basic Means of Egress

Topic 4-1: Means of Egress Elements 1:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe exit access, exits, and exit discharge.

Enabling Learning Objectives (ELO):

1. Describe exit access, including:
 - Corridors
 - Aisles
 - Pathways leading to an exit
 - Unenclosed ramps
 - Occupied rooms
2. Describe exits, including:
 - Number required
 - Doors
 - Exit corridors
 - Exit passageways
 - Protected or exterior stairwells
 - Smoke-proof enclosures and pressurized stairways
3. Describe exit discharge, including:
 - Exterior walkways
 - Private driveways and alleys

Discussion Questions

1. How does an inspector determine exit width?
2. What does the code cite as the minimum required exit width?
3. How do you determine the aisle width between unfixed tables and chairs?

Activities

1. Activity 4-1: Means of Egress Elements

Topic 4-2: Means of Egress Components 3:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe means of egress components, the relationship of fixed fire protection systems to egress requirements, egress pathway illumination, emergency lighting, exits signs and exit sign illumination, special egress control devices, access controlled egress doors, the relationship of fixed fire protection systems to approved means of egress elements, travel distance, and how to identify, document and report deficiencies.

Enabling Learning Objectives (ELO):

1. Describe means of egress components, including:
 - Doors
 - Door swing
 - Hardware
 - Corridors
 - Walls
 - Ceilings
 - Floors
 - Stairs
 - Ramps
 - Fire escape ladders
 - Fire escape slides (slidescapes)



COURSE INFORMATION AND REQUIRED MATERIALS

FIRE INSPECTOR 1B COURSE PLAN

2. Describe the relationship of fixed fire protection systems to egress requirements
3. Describe egress pathway illumination
4. Describe emergency lighting
5. Describe exits signs and exit sign illumination
6. Describe special egress control devices
7. Describe access controlled egress doors
8. Describe the relationship of fixed fire protection systems to approved means of egress elements, including doors, hardware, and lights
9. Describe travel distance (fire sprinklers, horizontal exits, active vs. passive)
10. Describe how to identify, document and report deficiencies

Discussion Questions

1. What is the difference between a fire door and a smoke and draft assembly?
2. What mandates the maintenance of fire escapes?
3. When does the code require pathway illumination?
4. When does the code require floor-level exit signs?

Activities

1. To be determined by instructor.

Topic 4-3: Egress Inspection 1:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to determine occupancy-based egress requirements and egress maintenance conditions.

Enabling Learning Objectives (ELO):

1. Describe occupancy-based egress requirements, including:
 - Occupant load
 - Travel distance
 - Number of exits
 - Separation
2. Describe egress maintenance conditions, including:
 - Operational doors
 - Unobstructed pathways
 - Proper illumination
 - Proper signage
 - Under alarm conditions
 - Delayed egress locks
 - Access control egress
 - Pressurized stairways
 - Smoke-control systems
 - Automatic closing fire doors

Discussion Questions

1. Is an exterior path of egress part of an exit system?
2. Is a door that is part of a listed assembly always required to be self-closing?
3. When does the code allow an exit to terminate before reaching a public way?

Activities

(Instructor to develop)

1. Given a plan, determine occupancy classification, square footage, occupant load, number of exits required, exit separation, door hardware, signage, and illumination.

Evaluation: Formative Test, Summative Test

Unit 5: Fire Growth Potential in a Building or Space

Topic 5-1: Fire Behavior 2:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe the fire tetrahedron, stages of a fire, and the impact of flame spread on smoke development, and identify energy sources and heat transfer mechanisms.



COURSE INFORMATION AND REQUIRED MATERIALS

FIRE INSPECTOR 1B COURSE PLAN

Enabling Learning Objectives (ELO):

1. Describe the fire triangle / tetrahedron
 - Triangle: oxidizer, reducing agent (fuel), energy
 - Tetrahedron: oxidizer, reducing agent (fuel), energy, chemical chain reaction
2. Identify energy sources, including:
 - Mechanical
 - Chemical
 - Electrical
 - Nuclear
3. Describe fire stages, including:
 - Incipient
 - Growth
 - Fully developed
 - Decay
4. Describe the impact of flame spread and smoke development, including:
 - Maintaining a tenable environment
 - Flashover
 - Backdraft
 - Impaired visibility caused by smoke development
 - Compromised exits due to products of combustion
5. Identify heat transfer mechanisms, including:
 - Convection
 - Conduction
 - Radiation
 - Direct flame contact

Discussion Questions

1. What are the components of the fire tetrahedron?
2. In which stage of a fire does flashover occur?
3. What is the most common heat transfer method found in a structure fire?
4. What form of heat transfer takes place when a fire transfers from one structure to another?

Activities

1. To be determined by instructor.

Topic 5-2: Elements that Impact Fire Growth Potential 2:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe maintenance requirements for building construction elements and fire protection systems; how interior finishes, decorations and decorative materials impact fire growth potential; storage practices; commodity classifications; and how to verify deficiencies; and identify safe housekeeping practices and special furnishing requirements for atriums and assembly areas.

Enabling Learning Objectives (ELO):

1. Describe maintenance requirements for building construction elements (passive), including:
 - Shafts
 - Corridors
 - Rated stairwells
 - Doors
 - Fire barriers
 - Fire walls
 - Protected openings
 - Penetrations
2. Describe maintenance requirements for active fire protection building systems, including:
 - Smoke control
 - Fire sprinklers



FIRE INSPECTOR 1B COURSE PLAN

- Fire alarms
- 3. Describe how interior finishes impact fire growth potential, including:
 - Wall and ceiling finishes
 - Floor finishes
 - Steiner tunnel test
- 4. Describe how decorations and decorative materials impact fire growth potential
- 5. Identify special furnishing requirements for:
 - Atriums
 - Assembly areas
- 6. Identify safe housekeeping practices
- 7. Describe storage practices, including:
 - Piled storage
 - High piled storage
 - Palletized storage
 - Rack storage
- 8. Describe commodity classifications (see CFC, chapter 23)
 - I, II, III, IV, high hazard, plastics
- 9. Describe how to verify deficiencies, including:
 - Observation and documentation
 - Reporting
 - Resolving or referring

Discussion Questions

1. What do the results of a Steiner tunnel test reveal?
2. What passive and active systems failed in the MGM fire?
3. What impact would an unprotected shaft have on a multistory building during a fire?
4. How does a material's flame spread impact fire behavior?
5. What is the difference between piled storage and high piled storage?

Activities

(Instructor to develop)

1. Analyze a video of the MGM fire.

Unit 6: Fire Department Access and Water Supply

Topic 6-1: Fire Department Access 2:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify the requirements and specifications for fire department emergency access and identify, document, and resolve deficiencies.

Enabling Learning Objectives (ELO):

1. Identify the requirements for fire department access (refer to local requirements), including:
 - Standard
 - Must provide access to within 150 feet of all portions of the exterior of the building
 - Must provide access of more than 150 feet with an approved turnaround
 - Exceptions
 - Discretion of the fire code official
2. Identify the specifications for a required fire department access roadway, including:
 - Width: a minimum of 20 feet clear width
 - Turn radii must conform with local apparatus
 - Fire apparatus turnaround
 - Height minimum: 13 feet 6 inches
 - Weight must conform with local apparatus axle loads
 - Must have all-weather driving surface
 - Local approval required for road slope (see CFC Appendix D)
 - Bridges must support fire apparatus
 - Signage and curb marking must comply with the California Vehicle Code



FIRE INSPECTOR 1B COURSE PLAN

- Gates and barricades
 - Key boxes or electronic switches
- 3. Describe how to identify, document, and resolve deficiencies

Discussion Questions

1. Why do local jurisdictions require fire lanes?
2. Who enforces fire lanes?
3. What constitutes an all-weather driving surface?

Activities

1. To be determined by instructor.

Topic 6-2: Available Firefighting Water Supply 1:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify issues that impact water flow testing, different hydrant types, and the tools needed to evaluate available water flow; describe approved water sources, water distribution systems, how hydrant spacing impacts firefighting operations, and how dead end water lines impact available fire flow; calculate and graph fire flow results; and identify, document, and resolve deficiencies.

Enabling Learning Objectives (ELO):

1. Identify issues that impact water flow testing, including:
 - Discharge requirements (National Pollutant Discharge Elimination System)
 - Flood control authority policies
 - Water purveyor policies
2. Describe approved water sources
3. Describe water distribution systems, including:
 - Private vs. public systems
 - Private vs. public fire hydrants
4. Identify different hydrant types
5. Describe how hydrant spacing impacts firefighting operations
6. Describe how dead end water lines impact available fire flow
7. Identify the tools needed to evaluate available water flow, including:
 - Pitot gauge
 - Pressure gauge
 - Water map showing mains and direction of flow
 - Diffusers
 - Formulas
8. Describe how to calculate and graph fire flow results
9. Describe how to identify, document, and resolve deficiencies

Discussion Questions

1. How do you determine the fire flow for a building or project?
2. How does the installation of fire sprinklers affect fire flow?
3. What sprinkler systems qualify for fire flow reductions?
4. What are the minimum fire flow requirements for commercial and residential projects?
5. How do you determine hydrant spacing?
6. Is a recycled water system an approved water source for firefighting?

Activities

(Instructor to develop)

1. Given a data set, calculate and graph fire flow results.

Topic 6-3: Access and Water Supply Inspection 0:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to verify that a fire department access road was required as part of construction, proper maintenance of required water supplies, and deficiencies.

Enabling Learning Objectives (ELO):



FIRE INSPECTOR 1B COURSE PLAN

1. Describe how to verify that a fire department access road was required as part of construction, including:
 - Ensuring proper and adequate addressing for the property
 - Ensuring all access keys (if provided) are correct and in the key box
 - Verifying proper fire lane maintenance
 - Verifying proper fire department access maintenance
 - Verifying provision of proper fire lane signage and markings
2. Describe how to verify proper maintenance of required water supplies, including:
 - Verifying access to hydrants maintenance
 - Verifying proper maintenance of private hydrants in accordance with CCR, Title 19, chapter 5
3. Describe how to verify deficiencies, including:
 - Observation and documentation
 - Reporting in accordance with jurisdictional codes, standards, and policies
 - Referring to appropriate level when necessary
4. Describe how to identify, document, and resolve deficiencies

Discussion Questions

1. What code requires access and water supply for firefighting?
2. What does the code require as the minimum clear height for a fire lane?
3. What does the code state as the minimum width of a fire lane?
4. Who designates fire lanes?

Activities

1. To be determined by instructor

Unit 7: Fire Potential in the Wildland Urban Interface Environment

Topic 7-1: History 1:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe the wildland urban interface environment; identify the history of fire in the wildland urban interface; and describe the consequences of severe wildland fire conditions.

Enabling Learning Objectives (ELO):

1. Describe the wildland urban interface
 - A location where significant combustible vegetation meets the built environment, and there is the potential for fire to transition from vegetation to those structures
2. Identify the history of fire in the wildland urban interface, including:
 - Paint fire (Montecito)
 - Tunnel fire (Oakland)
3. Describe the consequences of severe wildland fire conditions, including:
 - Interface conflagrations will exceed fire suppression resource capabilities
 - Life loss
 - Property loss
 - Environmental impact
 - Economic impact

Discussion Questions

1. What does WUI stand for?
1. What are some of the fire problems illustrated by the Paint Fire (Santa Barbara / 1990)?
2. What are some of the fire problems illustrated by the Tunnel Fire (Caldecott Tunnel / 1984)?

Activities

(Instructor to develop)

1. Identify the consequences of a WUI fire and discuss ideas in small groups.

Topic 7-2: Fire Behavior in a Wildland Urban Interface 1:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify factors that impact fire behavior in the wildland urban interface environment and methods of heat transfer.

Enabling Learning Objectives (ELO):



COURSE INFORMATION AND REQUIRED MATERIALS

FIRE INSPECTOR 1B COURSE PLAN

1. Identify factors impacting wildland fire behavior, including:
 - Fuel
 - Fuel loading
 - Combustible vegetation
 - Fire-resistant plant materials
 - Fuel moisture content
 - Topography
 - Aspect
 - Slope
 - Features
 - Weather
 - Wind
 - Temperature
 - Relative humidity
 - Atmospheric stability
 - Precipitation
2. Identify heat transfer methods, including:
 - Direct flame contact
 - Convection
 - Radiation
 - Ember transfer
 - Structure to structure
 - Fuel and fire laddering
 - Crown fire migration

Discussion Questions

1. How do weather conditions impact fire behavior?
2. How is fuel loading measured in a wildland urban interface environment?
3. What is aspect?
4. What are the types of fire transfer?

Activities

1. To be determined by instructor.

Topic 7-3: Fire Hazard Severity Zones 1:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe the fire hazard severity zone development process, define severity zone classifications, identify areas of responsibility, and describe construction methods as they relate to zone classification.

Enabling Learning Objectives (ELO):

1. Describe the fire hazard severity zone development process, including:
 - Fuel hazard
 - Weather
 - Fire history
 - Topography
 - Fuel receptivity
2. Define severity zone classifications, including:
 - Moderate
 - High
 - Very high
3. Identify responsibility areas, including:
 - Local Responsibility Area (LRA)
 - State Responsibility Area (SRA)
 - Federal lands



COURSE INFORMATION AND REQUIRED MATERIALS

FIRE INSPECTOR 1B COURSE PLAN

4. Describe construction requirements depending on zone classification
 - Special construction features (CBC chapter 7A)
 - Vegetation management requirements (CBC chapter 7A and CFC chapter 47)

Discussion Questions

1. What are the differences between an SRA and an LRA?
2. Can an SRA be within city limits?
3. In which severity zones do the requirements of CBC chapter 7A apply?

Activities

1. To be determined by instructor.

Topic 7-4: Wildland Urban Interface Issues 1:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe methods for dealing with fire hazards associated with a wildland urban interface environment, the components of a vegetation management plan, and documentation and reporting methods within a wildland urban interface environment.

Enabling Learning Objectives (ELO):

1. Describe methods for dealing with fire hazards associated with wildland urban interface environments, including:
 - Prescriptive construction requirements found in CBC, chapter 7A
 - Prescriptive fuel modification
 - Performance-based design
 - Master-planned communities
 - Construction features
 - Engineered fuel modification zone
2. Describe the components of a vegetation management plan, including:
 - Defensible space
 - Size, distance and zones
 - Fuel modification
 - Changing existing plant materials
 - Fuel reduction
 - Reducing the amount of existing vegetation
 - Wildland urban interface maintenance
 - As required by the AHJ or in accordance with a fuel management plan
3. Describe documentation and reporting methods in a wildland urban interface environment, including:
 - Observation and documentation
 - Reporting
 - Resolving or referring
4. Describe how to identify, document, and resolve deficiencies

Discussion Questions

1. What are the components of a vegetation management plan?
2. What are the components of a master-planned community in a WUI environment?
3. What construction features does chapter 7A of CBC modify for structures in a WUI environment?

Activities

1. To be determined by instructor.

Summative Testing 1:00

Formative Testing 2:00