



FEMA



National Fire Academy

**R0135 – Fire Protection for the Built Environment
Version: 1st Edition, 3rd Printing, August 2014**

Quarter:

ACE Credit: In the upper division baccalaureate degree category, three semester hours in fire science, fire technology, industrial safety, or occupational safety and health.

IACET Continuing Education Units: 3.9

Length of Course: 6 Days (48 contact hours, Sunday – Friday)

Prerequisite: Yes

**Curriculum: Fire Prevention: Technical
Training Specialist: Woody Stratton**

Instructor:

Instructor email/phone:

Classroom: J-

Meeting Time: 8 AM – 5 PM

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Course Description (Catalog)

R0135 – “Fire Protection for the Built Environment.” This six-day course will assist the student in understanding the underlying life safety and fire protection concepts from which modern building/fire code regulations are derived. It will emphasize essential life safety and fire protection concepts so that the student will be able to analyze hazardous conditions, interpret requirements found in building/fire codes and standards, and develop rational compliance strategies based on his or her evaluation of the circumstances.

Topics include the legal and administrative aspects of fire and life safety controls; fire suppression and control concepts; characteristics of materials that contribute to fire, heat and smoke; hazardous materials and control concepts; storage systems; egress design concepts;

building construction methods and services; hazardous operations; water supply systems; and technological applications for fire protection.

This course is not designed to be a “code training” course.

Student Qualifications (Primary and Secondary Audience)

Individuals whose primary duties are or are about to become those of a full-time code enforcement officer/inspector. Suppression COs responsible for in-service fire code enforcement activities.

Course Scope (Goal)

The purpose of this course is to introduce students to the many factors influencing fire protection in the built environment, as well as give them a fundamental understanding of how these factors may have evolved into or influenced the development of building and fire codes and standards.

Students who successfully complete this course should be able to apply their local building and fire codes with a solid background in how the codes were developed and the intent of their application.

Course Objectives (Course Learning Outcomes – TLOs)

Introduce students to the many factors influencing fire protection in the built environment, as well as give them a fundamental understanding of how these factors may have evolved into or influenced the development of building and fire codes and standards.

Course Delivery Method

The National Fire Academy (NFA) offers specialized training courses and advanced management programs of national impact in an academic classroom environment [on campus at the National Emergency Training Center \(NETC\) in Emmitsburg, Maryland](#). This classroom course is designed for the national level fire service officer from State and local fire service organizations. During this 6-day delivery, students will reside in dormitories provided on campus with classes conducted in classrooms designed for critical student/instructor interaction. All course materials are designed for interactive classroom environments, in either paper notebook or electronic formats.

Course Schedule

The purpose of the course schedule is to give you, at a glance, the required preparation, activities, and evaluation components of your course.

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
AM	Unit 0: Introduction and Course Overview Unit 1: Fire in America	Unit 2: Fire Dynamics and the Built Environment	Unit 3: Fire-Related Human Behavior	Unit 5: Active and Passive Fire Protection Systems	Unit 6: Hazardous Materials: Recognition and Control (cont'd) Unit 7: Fire Modeling Concepts	Travel
PM	Unit 1: Fire in America (cont'd)	Unit 2: Fire Dynamics and the Built Environment (cont'd)	Unit 4: Egress Concepts	Unit 5: Active and Passive Fire Protection Systems (cont'd) Unit 6: Hazardous Materials: Recognition and Control	Final Exam (open book) Graduation	

Course Resources (Instructional Materials)

In order to be fully prepared, obtain a copy of the required textbooks and other instructional materials prior to the first day of class.

Required Readings

The student must complete required readings during the course to be able to thoughtfully participate in discussions and activities.

None.

Suggested Reading/Resources

Suggested readings and resources are not evaluated, but may enhance the student's understanding, serve as additional sources for citation and promote discussion of course material.

None.

Required Resources (Course Textbook)

Student Manual.

Supplemental Resources (Supplemental Course Textbook)

None.

Grading Methodology (Evaluation Procedures)

The final exam contains 62 questions: true or false, multiple choice, fill-in-the-blank, and short essay. It is open book, meaning students may use all of the resources in the classroom (excluding instructors and other students) to answer the questions. Students must score 80 percent or better to pass.

A minimum final grade of at least 80 percent is required to pass this course.

Numerical Score	Letter Grade
100-90	A
89-80	B
79 or below	F

Required Reading Assignments

Student completion of reading assignments will be done via evaluation of their class participation and will not be a separately graded activity.

Suggested Readings

Suggested readings are not evaluated, but may enhance the student's understanding and promote discussion of course material.

Course Outline

Unit 0: Introduction and Course Overview (Day 1)

Objectives

None.

Unit 1: Fire in America (Day 1)

Objectives

The students will be able to:

1. Compare factors that have, in the past, influenced attitudes toward fire and life safety in the United States.
2. Explain the attitudinal change required to reverse the history of fire loss in the United States.
3. Identify groups and organizations that are involved in, or can have an impact on, the many aspects of fire and life safety design in the United States.
4. Describe how risk to life and property from fire is an inherent element of all human activity and the human environment.
5. Recognize that risk considerations can change with changes in building use, occupant turnover, and property management practices.
6. Explain the roles codes and standards play in fire-safe building design.
7. Explain the difference between prescriptive and performance-based codes.

8. Explain the difference among codes, standards, recommended practices, and guides, and how they relate to the built environment.
9. Explain the general legal process for the adoption and enforcement of building and fire codes.

Unit 2: Fire Dynamics and the Built Environment (Day 2)

Objectives

The students will be able to:

1. Explain basic fire behavior chemistry and physics using the following terms as they relate to the built environment:
 - a. Flashpoint.
 - b. Boiling point.
 - c. Flammable limits.
 - d. Conduction.
 - e. Convection.
 - f. Radiation.
 - g. Oxidizer.
 - h. Triple point.
 - i. Basic research.
 - j. Applied research.
 - k. Closed system.
2. Explain the progression of fire from start to extinguishment using the following terms as they relate to the built environment:
 - a. Heat flux/transfer.
 - b. Heat of combustion.
 - c. Heat-release rate (HRR).
 - d. T² fire.
 - e. Flashover.
 - f. Backdraft.
 - g. Fire plume.
 - h. Ceiling jet.
 - i. Homeostasis.
3. Recognize the factors in building design and occupancy that contribute to fire ignition, growth, and extinguishment.

Unit 3: Fire-Related Human Behavior (Day 3)

Objectives

The students will be able to:

1. Describe basic fire-related human behavior in the built environment.
2. Explain how the use or occupancy classification affects overall fire and life safety protection features.
3. Compare four strategies for preserving life in structures during fires or other environmental emergencies.

Unit 4: Egress Concepts (Day 3)

Objectives

The students will:

1. Compare the publicly perceived definition of “panic” with findings from empirical research.
2. Identify the basic components of an exit system.
3. Given a series of photographs, identify how individual egress components have been compromised.

Unit 5: Active and Passive Fire Protection Systems (Day 4)

Objectives

The students will:

1. Explain the concepts of both active and passive fire protection systems.
2. Predict the effects of fire and heat on certain construction materials, e.g., wood, steel, and concrete.
3. Describe fire-resistant materials and methods used to resist flame impingement and fire spread.

Unit 6: Hazardous Materials: Recognition and Control (Day 4)

Objectives

The students will:

1. List the 11 categories of hazardous materials regulated by the model building and fire codes, and provide examples of each.
2. Explain the difference between physical and health hazard materials.
3. List the four basic concepts for hazardous materials control in the built environment.
4. Explain how the environment where a material is located affects code enforcement.
5. Identify the physical state and hazard classification of a given list of hazardous materials, and provide the source of the information.

Unit 7: Fire Modeling Concepts (Day 5)

Objective

The students will explain how fire and egress modeling can be used in the fire and life safety design and evaluation of the built environment.

Policies

Class Attendance and Cancellation Policy

Attendance

- You are required to attend all sessions of the course. If you do not, you may not receive a certificate, and your stipend may be denied.
- If you need to depart campus early and miss any portion of the course and/or graduation, you must make the request in writing to the NFA training specialist. The training specialist, in collaboration with the superintendent, may waive the attendance requirement in order to accommodate you with extraordinary circumstances as long as you complete all course requirements. If you receive approval for departing early, you must forward the approval to the Admissions Office so your stipend reimbursement is not limited.

Student Substitutions

Substitutions for NFA courses are made from waiting lists; your fire department can't send someone in your place.

Cancellations or No-Shows

NFA's mission for delivery of courses is impaired significantly by cancellations and no-shows. It is very difficult and costly to recruit students at the last minute. Currently there is a two-year ban on student attendance for students who are no-shows or cancel within 30 days of the course start date without a valid reason. If you receive such a restriction, your supervisor needs to send a letter to our Admissions Office explaining the cancellation/no-show.

Course Failure

If you fail an on-campus course, you will not be issued a stipend for that course. You can reapply for the failed course or any other NFA course and go through the random selection process. You don't have to successfully complete the failed course before attending another NFA course.

Student Code of Conduct Policy

Students, instructors and staff are expected to treat each other with respect at all times. Inappropriate behavior will not be tolerated and may result in removal from campus and denial of stipends.

Writing Expectations

Student writing will conform to the generally accepted academic standards for college papers. Papers will reflect the original work of the student and give appropriate credit through citations for ideas belonging to other authors, publications or organizations. Student written work should be free of grammatical and syntax errors, free of profanity or obscene language or ideas, and reflect critical thinking related to the course subject matter.

Citation and Reference Style

Attention Please: Students will follow the APA, Sixth Edition as the sole citation and reference style used in written work submitted as part of coursework to NFA. Assignments completed in a narrative essay, composition format, abstract, and discussion posts must follow the citation style cited in the APA, Sixth Edition.

Late Assignments

Students are expected to submit classroom assignments by the posted due date (11:59 p.m. EDT/EST) and to complete the course according to the published class schedule. As adults, students, and working professionals, you must manage competing demands on your time. Discussion board postings submitted within 3 days after the submission deadline will receive up to a 20% deduction. Those that do not submit their discussion board postings within this timeline

will receive a “0” grade for the week. Final assignment papers will not be accepted after the deadline. Any paper submitted after the deadline will receive a “0” grade for that assignment.

Netiquette

Online learning promotes the advancement of knowledge through positive and constructive debate – both inside and outside the classroom. Forums on the Internet, however, can occasionally degenerate into needless insults and “flaming.” Such activity and the loss of good manners are not acceptable in a professional learning setting – basic academic rules of good behavior and proper “Netiquette” must persist. Remember that you are in a place for the rewards and excitement of learning which does not include descent to personal attacks or student attempts to stifle the forum of others.

- Technology Limitations. While you should feel free to explore the full-range of creative composition in your formal papers, keep e-mail layouts simple. The NFA Online classroom may not fully support MIME or HTML encoded messages, which means that bold face, italics, underlining, and a variety of color-coding or other visual effects will not translate in your e-mail messages.
- Humor Note. Despite the best of intentions, jokes and especially satire can easily get lost or taken seriously. If you feel the need for humor, you may wish to add “emoticons” to help alert your readers: ;-), :), ☺ .

Disclaimer Statement

Course content may vary from the outline to meet the needs of this particular group.

Grading

Please review the following rubrics that explain how grades will be awarded.

Students who do not complete the entire course will be awarded an Incomplete (I) grade. In accordance with National Fire Academy academic policies, an Incomplete (I) grade must be removed by the end of the next semester following the course, or it automatically becomes a Failing (F) grade.

If you fail an on-campus course, you will not be issued a stipend for that course. You can reapply for the failed course or any other NFA course and go through the random selection process. You don’t have to successfully complete the failed course before attending another NFA course.

http://www.usfa.fema.gov/training/nfa/admissions/student_policies_campus_information.html

Academic Honesty

Students are expected to exhibit exemplary ethical behavior and conduct as part of the NFA community and society as a whole. Acts of academic dishonesty including cheating, plagiarism, deliberate falsification, and other unethical behaviors will not be tolerated.

Students are expected to report academic misconduct when they witness a violation. All cases of academic misconduct shall be reported by the instructor to the Training Specialist.

If a student is found to have engaged in misconduct and the allegations are upheld, the penalties may include, but are not limited to one or a combination of the following:

- expulsion,
- withholding of stipend or forfeiture of stipend paid,
- exclusion from future classes for a specified period; depending on the severity it could range from 1-10 years, and/or
- forfeiture of certificate for course(s) enrolled in at NETC.

Refer to NFA-specific Standard Operating Procedure 700.1 – *Academic Code of Conduct and Ethics* for more information.