## FFP2120 Building Construction for the Fire Service

**Title:** Master Syllabus  
**Date:** September 20, 2012

<table>
<thead>
<tr>
<th><strong>Course Title</strong></th>
<th>Building Construction for the Fire Service</th>
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<tbody>
<tr>
<td><strong>Course Number</strong></td>
<td>FFP2120</td>
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<tr>
<td><strong>Prerequisite(s)</strong></td>
<td>None</td>
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<tr>
<td><strong>Revision Date</strong></td>
<td>January 1, 2011</td>
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<tr>
<td><strong>College Credit Recommendation</strong></td>
<td>This course has a college recommendation of 3 credits.</td>
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<tr>
<td><strong>Continuing Education Units (CEU’s)</strong></td>
<td>40 hours towards Fire Safety Inspector renewal.</td>
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<tr>
<td><strong>Class Days/Time</strong></td>
<td>Monday – Friday8:00 a.m. – 5:00 p.m.</td>
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</tbody>
</table>
| **Program Specialist Contact Info** | Name: Barbara Klingensmith  
e-Mail: Barbara.Klingensmith@myfloridacfo.com |
| **Class Location** | Room 107                                  |
| **Course Description** | This course will cover various topics including: identifying hazards from assault by fire and gravity; how building construction can influence fire spread, fire confinement or structural collapse; and other life safety issues. This course identifies construction features and their hazards under fire conditions. |
| **Student Learning Outcomes** | After the successful completion of this course, the student will be able to do the following:  
1. Explain the history of building construction and its impact on the fire services including design features and the construction process.  
2. Discuss the importance of fire resistance and its impact on building construction and classification types.  
3. Describe various forces and loads placed upon buildings and how these affect structural components and systems.  
4. Discuss various building systems for moving people and materials, HVAC systems, and smoke control systems and the electrical systems found in buildings and how they relate to firefighting activities.  
5. Discuss building construction, interior finishes, and fire doors and their effect on fire behavior.  
6. Describe foundations and considerations when determining the type of foundation to include loads, surface materials, and settlement.  
7. Explain the considerations when using wood as a building component.  
8. Explain masonry products and how they are used in buildings.  
9. Describe properties of steel and where steel is used in building. |
10. Describe the characteristics of concrete and how it is used in building structures.

11. Describe roofs and roof support systems and the materials used to construct them, and the impact on firefighting.

12. Discuss special structures such as high rises, underground buildings, membrane structures, correctional facilities, and atriums and the concerns for firefighting and life safety.

13. Discuss concerns related to buildings under construction, remodeling, expansion, and demolition.

14. Discuss building collapse from forces of nature and building codes that can help minimize the effects of natures.

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<tr>
<td>Required Materials</td>
<td>None.</td>
</tr>
<tr>
<td>Method of Instruction</td>
<td>Classroom</td>
</tr>
<tr>
<td>Grading</td>
<td>Passing 70%</td>
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<tr>
<td>Certification(s)</td>
<td>One of eight required courses for Fire Officer I certification and one of five required courses for Fire Safety Inspector I.</td>
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<tr>
<td>Attendance Policy</td>
<td>You are required to attend all sessions of the course and complete all pre-course assignments. Failure to appear in class for a scheduled activity will be considered an absence. Students are allowed to miss 10% of the class and still receive credit. There are no makeup sessions.</td>
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<tr>
<td>Academic Integrity</td>
<td>Academic integrity is crucial to the learning community and indicates respect for the college, the instructor, the course, your classmates and yourself. Any violation of this trust, including but not limited to cheating, plagiarism, collusion, or using or having any content of an un-administered test, will result in immediate dismissal from the course. Under Florida Statute 633, any student dismissed for academic dishonesty can be refused acceptance for any course administered by FSFC.</td>
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<tr>
<td>Students with Disabilities</td>
<td>Any student who has a permanent or temporary disability that may require a reasonable accommodation to participate in the course must present documentation of the disability and requested accommodation no later than the beginning of the course.</td>
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| Emergency Evacuation Policy | Occupants of buildings on the Florida State Fire College campus are required to evacuate and assemble outside when a fire alarm is activated or an announcement is made. Please be aware of the following policies regarding evacuation.  
- Familiarize yourself with all exit doors of the classroom and the building.  
- Remember that the nearest exit door may not be the one you used when you entered the building. |
- If you require assistance to evacuate, inform the instructor on the first day of class.
- In the event of an evacuation, follow the guidance of the instructor.
- Do not re-enter a building unless you are given instructions by Florida State Fire College personnel to do so.

**Requesting Emergency Care**

Any request for emergency care should be initiated by calling “911” from any phone on campus of the Florida State Fire College. Phones are located in each classroom. Additionally, in the event of any emergency, immediately contact an instructor or staff member.

**Critical Event Procedures**

**Severe Weather** – there is a lightning detection system on campus which has an audible 15 second blast of an air horn. If you are outside, please follow your instructor or move to the closest permanent building. Once the threat is over, there will be three 5 second blasts of the signal.

**Security** – During the daytime, security is handled by full time faculty and staff. There are security guards on duty in the evenings and weekends. Please comply with the requests made of security officers. Failure to do so can result in removal from campus.

**Student Badges** – You will be issued a badge to be worn anytime you are on campus.

**Enabling Objectives**

Given information from discussion and reading materials, the student will perform the following objectives to a written test accuracy of at least 70% and meet the applicable job performance requirements of NFPA 1021 (2009) and NFPA 1031 (2009).

**Chapter 1: Building Construction and the Fire Service**

1. Recognize the significance of methods and materials historically used in building construction, as well as the importance of the age of the building itself.
2. Discuss building variables as they relate to the work of firefighters.
3. Explain communication of fire and the ways in which it occurs.
4. Describe factors that affect communication of fire and methods used to protect buildings from exposing fires.
5. Discuss building failure, structural integrity, building systems, and design deficiencies as building design considerations.
6. Explain the principles of design and why buildings are built.
7. Discuss design considerations.
8. Understand how hurricane windows affect ventilation. (FL Objective)
9. Describe the design and construction process.
10. Recognize the role of the building permit process and preincident planning in the construction of a building.
11. Understand the process for Florida inspectors to review permits for construction, renovation, etc. (FL Objective)
12. Identify Florida rules pertaining to the adoption of the Florida Building Code, Florida Fire Prevention Code, and NFPA 101. (FL Objective)
13. Describe the Florida Accessibility Code for Building Construction. (FL Objective)
14. Explain who must conduct building inspections, what certifications must be held, and that the inspection must comply with NFPA 101 as well as witnessing fire system tests. (FL Objective)
15. Identify state requirements for record retention for fire departments. (FL Objective)

**Chapter 2: Structural Fire Resistance and Building Classifications**

1. Define fire resistance.
2. Discuss methods of determining fire resistance and the limitations of each method.
3. Identify fire testing organizations and discuss the significance of fire test results.
4. Identify Florida’s criteria for designation as an approved Nationally Recognized Testing Laboratory. (FL Objective)
5. Recognize commonly used internet websites for most NTRL’s. (FL Objective)
6. Recognize the role of analysis in determining fire resistance.
7. Identify Florida Building Code Section 721 as having procedures to determine fire resistance. (FL Objective)
8. Discuss the basic building classifications as they relate to fire resistance.
9. Discuss the concept of fire load and its impact on building construction types.
10. Explain occupancy classifications as they relate to fire risks.
11. Explain additional residential occupancies. (FL Objective)

**Chapter 3: The Way Buildings Are Built: Structural Design Features**
1. Explain the various loads exerted on a building resulting from environmental sources.
2. Distinguish between the classifications of loads based on origin and movement.
3. Recognize and discuss the internal forces resulting from the loads and forces applied to a structural member.
4. Describe the basic structural components.
5. Describe the basic structural systems.
6. Describe lightweight truss markings as covered in F.S. 663.027 and FAC 691-60.0081. (FL Objective)

**Chapter 4: Building Systems**

1. Discuss the various types of stairs and the structural requirements related to each.
2. Describe the various types of elevators and their safety features.
3. Identify Florida Elevator Safety Law as found in F.S. Chapter 399. (FL Objective)
4. Identify the requirement for high rise residential buildings and elevator access according to FS 553.509(2). (FL Objective)
5. Discuss moving stairways, walkways, and conveyors as they relate to firefighting concerns.
6. Describe the uses of vertical shafts and utility chases and their impact on firefighting.
7. Describe the functions and components of HVAC systems and how they impact firefighting.
8. Distinguish between various smoke control methods.
9. Discuss the various types of electrical equipment found in building structures and the hazards posed by each.
10. Identify NFPA 82 Standard on incinerators and waste and linen handling systems. (FL Objective)
12. Identify Florida requirements for gas stations to have emergency alternate power capability per F.S. 526.143. (FL Objective)
**Chapter 5: Fire Behavior and Building Construction**

1. Discuss the factors affecting combustibility of various interior finishes and their effects on fire behavior.
2. Explain the methods used to evaluate the surface burning characteristics of interior finish materials.
3. Discuss compartmentation as it relates to fire and smoke containment.
4. Describe the types of walls used to prevent fire spread and their effectiveness in providing fire and smoke containment.
5. Describe the requirements for fire doors and their contribution to fire and smoke containment.

**Chapter 6: Foundations**

1. Explain how different types of surface material affect the types of foundations and the types of buildings that can be built on them.
2. Describe the types of foundations and the conditions that determine which type is used.
3. Describe the construction of foundation walls and the concerns related to cracking.
4. Explain the differences between uniform and differential settlement.
5. Discuss shoring and underpinning and their potential impact on fire department operations.

**Chapter 7: Wood Construction**

1. Discuss the material properties of the wood products used in construction.
2. Explain the variables that affect the combustibility of wood used as a construction material.
3. Describe the methods of treating wood with a fire retardant.
4. Describe the framing systems constructed of wood and the purpose of fire stops in those framing systems.
5. Describe the materials used to construct the exterior and interior walls of a wood-frame building.
6. Discuss the considerations related to collapse, ignition-resistance, and deterioration as they relate to wood-frame construction.

**Chapter 8: Masonry and Ordinary Construction**
1. Describe the properties of the masonry products used as building material.
2. Describe the construction techniques and characteristics of masonry walls.
3. Describe the characteristics of the interior structural framing used in masonry buildings.
4. Discuss the factors that affect fire behavior in masonry structures.
5. Explain the differences between mill construction and ordinary masonry construction.

### Chapter 9: Steel Construction

1. Describe and differentiate the properties of steel and iron used as building material.
2. Describe the types of steel frame structures and their applications.
3. Identify the types and uses of steel frames in flooring systems.
4. Discuss how connections and lighter weight construction affect the potential for collapse of steel structures.
5. Describe the materials used to provide fire resistance to steel members and their effectiveness.
6. Discuss the importance of code modifications as they relate to firefighting.

### Chapter 10: Concrete Construction

1. Describe the production process of concrete.
2. Describe the methods used to reinforce concrete used in building structures.
3. Discuss the methods of ensuring the quality of concrete.
4. Describe the concrete framing systems used in building structures.
5. Discuss the factors that affect the performance of concrete under fire conditions.

### Chapter 11: Roofs

1. Identify the ways roofs can affect structural firefighting.
2. Describe the characteristics of the different architectural styles of roofs.
3. Describe the systems used to support roofs.
4. Explain the functions of the roof deck and describe the materials used to
| Construct it.  
5. Describe the types and materials used as roof coverings for the different types of roofs.  
6. Describe the testing process used to determine the fire rating of roof coverings.  
7. Describe the characteristics of roofs installed for specific purposes.  
8. Discuss the purpose of penthouses and skylights and their impact on fire fighting tactics.  
9. Describe the impact ceilings have on fire spread to roofs.  

**Chapter 12: Special Structures and Design Features**  
1. Describe the characteristics of high-rise buildings and their impact on fire fighting tactics.  
2. Describe the fire protection systems in high-rise buildings and their integration into firefighting tactics.  
3. Explain the emergency use of elevators in high-rise buildings during a fire event.  
4. Discuss the unique aspects of underground buildings and how they affect fire fighting.  
5. Identify the usual code requirements for buildings with limited access.  
6. Describe the characteristics of membrane structures and their impact on fire fighting tactics.  
7. Describe the characteristics and construction of covered malls.  
8. Identify the primary concerns when managing a fire event in a detention/correctional facility.  
9. Discuss the building codes that apply to atriums from a fire safety standpoint.  
10. Describe the forces involved in an explosion and the methods to reduce the resultant structural damage.  
11. Identify the requirements for areas of refuge for individuals with disabilities.  
12. Describe the characteristics of rack storage as it relates to fire spread and fire fighting tactics.  

**Chapter 13: Buildings Under Construction, Remodeling, Expansion, and Demolition**
1. Describe the impact of conditions found at construction sites on fire fighting tactics.
2. Discuss the methods of providing fire protection at construction sites.
3. Identify and discuss the hazards associated with building remodeling and renovation as they impact fire fighting.
4. Describe the impact building expansion projects have on life safety systems in the existing building.
5. Describe the hazards presented by buildings being demolished as they relate to fire fighting tactics.

**Chapter 14: Non-Fire Building Collapse**

1. Describe the forces of nature that can result in partial or total building collapse.
2. Discuss the building code requirements to minimize the effect of the forces of nature on building stability.
3. Describe the scenarios that result in human-caused building collapse.