

### Basic Course Information

Semester:	<b>Spring 2022</b>	Instructor Name:	<b>Alfredo Estrada</b>
Course Title & #:	<b>Building Construction for the Fire Service</b>	Email:	<b>Alfredo.estradajr@imperial.edu</b>
CRN #:	20547	Webpage (optional):	<b>N/A</b>
Classroom:	<b>Online</b>	Office #:	<b>760-222-0177</b>
Class Dates:	<b>Spring 2022</b>	Office Hours:	<b>N/A</b>
Class Days:	<b>Online</b>	Office Phone #:	<b>760- 222-0177</b>
Class Times:	Online	Emergency Contact:	<b>760-222-0177</b>
Units:	3	Class Format:	Online

### Course Description

- This course is based on the content in the IFSTA manual *Building Construction Related to the Fire Service 3<sup>rd</sup> Edition*.
- The course meets or exceeds the requirements of the Fire and Emergency Services Higher Education (FESHE) *Building Construction for Fire Protection* standard.

### Course Prerequisite(s) and/or Corequisite(s)

None

### Student Learning Outcomes

1. Describe building construction as it relates to firefighter safety, buildings codes, fire prevention, code inspection, firefighting strategy, and tactics.
2. Classify major types of building construction in accordance with a local/model building code.
3. Analyze the hazards and tactical considerations associated with the various types of building construction.
4. Explain the different loads and stresses that are placed on a building and their interrelationships.
5. Identify the function of each principle structural component in typical building design.
6. Differentiate between fire resistance, flame spread, and describe the testing procedures used to establish ratings for each.
7. Classify occupancy designations of the building code.
8. Identify the indicators of potential structural failure as they relate to firefighter safety.
9. Identify the role of GIS as it relates to building construction.

## Course Objectives

### Chapter 1

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. Describe the design and construction process.
9. Recognize the role of the building permit process and preincident planning in the construction of a building.

### Chapter 2

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. Recognize the role of analysis in determining fire resistance.
5. Discuss the basic building classifications as they relate to fire resistance.
6. Discuss the concept of fire load and its impact on building construction types.
7. Explain occupancy classifications as they relate to fire risks.

### Chapter 3

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.

### Chapter 4

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. Discuss moving stairways, walkways, and conveyors as they relate to firefighting concerns.
4. Describe the uses of vertical shafts and utility chases and their impact on firefighting.
5. Describe the functions and components of HVAC systems and how they impact firefighting.
6. Distinguish between various smoke control methods.
7. Discuss the various types of electrical equipment found in building structures and the hazards posed by each.

## **Chapter 5**

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**

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.

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## **Chapter 7**

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**

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**

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**

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.

### Textbooks & Other Resources or Links

**Text Book: Building Construction Related to the Fire Service Third Edition (Author IFSTA)**  
**ISBN- 978-0-87939-471-4**

### Course Requirements and Instructional Methods

#### Assignments

Students will complete the following assignment activities. When completing your written assignments in either Microsoft Word or rich text format (using Times New Roman size 12 font ONLY) – not Word Perfect, use APA CITED textbook concepts to analyze the disaster response issues. If you just complete the assignments in broad terms without applying text concepts using APA citations, your grade will be significantly lower. While older sources are fine, students must include the required number of citations from the textbook and more current sources.

**APA Citations:** APA citations are required for assignments. Please ensure you're familiar with the process for correctly citing sources in your course submissions.

I strongly recommend students review a grammar/writing guide prior to submitting assignments. My goal is assignments will be reviewed and grades posted within 24 hours of their submission. Assignments submitted late will have a 10 % penalty assessed for each week late. Cover, reference, appendix, and table pages DO NOT count towards the page length requirements. There is NO extra credit or makeup assignments offered in the course, so every assignment contributes to students' final course grades. Assignments MUST be posted to the BB site and do NOT get course messaged to me. I do not want a “backup” copy sent to me. Use Canvas site only – thanks!

#### **Research Paper 1:**

**100 Points**

**DUE DATE: 03/20**

**(Found in tab labeled Assignments)**

Prepare a three-page (double-spaced) paper on World Trade Center Towers. Describe how the towers were constructed and what materials were used. In addition, describe the types of fire suppression systems and fire resistant materials that composed the building. Please utilize at least five text citations and five citations from other sources to support the discussion of the topic. Use headers to break up the various section of this assignment is MANDATORY.

#### **Mid-term Exam (Chapter 1 - 5)**

**100 Points**

**DUE DATE: No later than 04/18-04/24**

**(Found in tab labeled Test and Quizzes)**

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Complete the multiple choice, true/ false, and essay mid-term exam.

**Final Exam (Chapters 1 - 10):**

**100 Points**

**DUE DATE: 06/10- 06/10**

Complete the multiple choice, true/ false, and essay final exam.  
**(Found in the tab labeled Tests and Quizzes)**

**Discussion Forums (# = 5 @ 30 points each)**

**150 Points**

**(Found in the tab labeled Discussion Board)**

This is a two paragraph (using CITED text concepts) reply to the discussion topic. The objective is increased student interaction/ communication discussing about Building Construction, as it relates the fire service. Discussion forum deadlines will be posted, and there will be zero credit for replying once the discussion session has ended. There are two extra Discussion Boards in case you missed a discussion and don't want to miss out on points. **The first Discussion Board includes a self-introduction component so that students get to know each other.**

**Journal Entry Chapter Summaries are mandatory non-credit assignments. Although no credit is given, 3 points will be deducted for each journal entry not completed**

**Quizzes (Chapter 1-10)**

**100 Points**

**Minimum technical skills expected:**

As an online student you will have a much different "classroom" experience than a traditional student. In order to ensure that you are fully prepared for your online courses, following is a list of expectations and requirements: Students in a hybrid and/or on-line program should be comfortable with and possess the following skill sets:

1. Self-discipline
2. Problem solving skills
3. Critical thinking skills
4. Enjoy communication in the written word

As part of your online experience, you can expect to utilize a variety of technology mediums as part of your curriculum:

1. Communicate via email including sending attachments
2. Navigate the World Wide Web using a Web browser such as Internet Explorer
3. Use office applications such as Microsoft Office (or similar) to create documents
4. Be willing to learn how to communicate using a discussion board and upload assignments to a classroom Web site
5. Be comfortable uploading and downloading saved files
6. Have easy access to the Internet

**Announcement:**

In the announcement section you will my “Welcome/Self-Introduction”. All upcoming events will be posted on a weekly basis, or as needed. Please be vigilant and monitor this section.

**Prerequisite knowledge:**

None

**Instructors Plan for Classroom response time and feedback on assignments:**

Please note that you will receive a response/feedback within 24 hours after having posted your question in the “Ask the Instructor” Discussion Board. For a faster response please feel free to text me at 760 222-0177.

**Course Grading Based on Course Objectives**

**Grading scale:** A = 550 to 500 points; B = 499 to 450 points; C = 449 to 400 points; and F = 399 to 0 points.

**Course Policies**

Welcome to the world of online courses. This may be your first experience taking web-based courses, you may have some experience, or you may have taken a number of courses previously. Online learning is a form of social interaction, and as such, it has its own rules for interacting with others. This guide is intended to be an overview of appropriate etiquette for interaction in this online environment.

***Disembodied Discussions***

A key distinguishing feature of online courses is that communication occurs solely via the written word. Because of this, the body language, voice tone, and instantaneous listener feedback of the traditional classroom are all absent. These facts need to be taken into account both when contributing messages to a discussion and when reading them. Keep in mind the following points:

***Tone Down Your Language***

Given the absence of face-to-face clues, written text can easily be misinterpreted. Avoid the use of strong or offensive language and the excessive use of exclamation points. If you feel particularly strongly about a point, it may be best to write it first as a draft and then to review it, before posting our statement.

In general, avoid humor and sarcasm. These frequently depend either on facial or tone of voice cues absent in text communication or on familiarity with the reader.

If someone states something you find offensive, mention it directly to the instructor. Remember the person may be new to online learning. What you find offensive may be an unintended and can be corrected by the instructor.

***Test For Clarity***

Messages may often appear perfectly clear to you as the student but turn out to be confusing by another reader. One way to test for clarity is to read your message aloud to see if it flows smoothly.

Be concise when possible when contributing to a discussion. If you have several points you want to make, it may be a good idea to post them individually in more focused messages rather than a single, all-encompassing message.

Think carefully about the content of your message before contributing to the discussion. Once sent to the group, there is no taking it back. Although grammar and spelling may not be graded, they do reflect on you, and your audience might not be able to decode misspelled words or poorly constructed sentences. Acronyms and Emoticons are popular to use. Remember that online courses require professional writing. Be discerning with your use of “texting” writing.

## Other Course Information

- Plagiarism is taking and presenting as one’s own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to ‘cite a source’ correctly, you must ask for help.
- Cheating is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the General School Catalog for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment; (c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

## IVC Student Resources

- Learning Labs: There are several ‘labs’ on campus to assist you through the use of computers, tutors, or a combination. Please consult your college map for the Math Lab, Reading & Writing Lab, and Study Skills Center (library). Please speak to the instructor about labs unique to your specific program.
- Library Services: There is more to our library than just books. You have access to tutors in the Study Skills Center, study rooms for small groups, and online access to a wealth of resources.

Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs and Services (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313, if you feel you need to be evaluated for educational accommodations.





Students have counseling and health services available, provided by the pre-paid Student Health Fee. We now also have a fulltime mental health counselor. For information see <http://www.imperial.edu/students/student-health-center/>. The IVC Student Health Center is located in the Health Science building in Room 2109, telephone 760-355-6310.

Students have the right to experience a positive learning environment and due process. For further information regarding student rights and responsibilities, please refer to the IVC General Catalog available online at [http://www.imperial.edu/index.php?option=com\\_docman&task=doc\\_download&gid=4516&Itemid=762](http://www.imperial.edu/index.php?option=com_docman&task=doc_download&gid=4516&Itemid=762)

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. Students can access tutorials at <http://www.imperial.edu/courses-and-programs/divisions/arts-and-letters/library-department/info-lit-tutorials/>

## Anticipated Class Schedule/Calendar

### **Week 1 One – Due Date: Sunday 02/20**

Review CANVAS PLATFORM-Course Introductions / Group Assignments / Syllabus Review / Canvas Familiarization; Ask Questions to the instructor about research papers and assignments

### **Week 3 Due Date: Sunday 03/6**

Readings – Chapter 1  
Review-Power-Point Chapter 1  
Discussion Board One  
Research Paper 1 Due 03/20

### **Week 5 Due Date: 03/20**

Worksheet- Building Construction Chapter 1 Due  
Take Quiz 1 Chapter 1  
Review- PowerPoint Chapter 2  
Readings- Chapter 2  
Selected readings posted to Canvas

### **Week 6-7 Due Date: 04/3**

Worksheet- Building Construction Chapter 2 Due  
Take Quiz 2 Chapter 2  
Review-PowerPoint Chapter 3  
Discussion Board Two  
Readings – Chapter 3

### **Week 9 Due Date: Sunday 04/17**

Worksheet- Building Construction Chapter 3 Due  
Take Quiz 3 Chapter 3  
Review- PowerPoint Chapter 4

Readings – Chapter 4  
Selected readings posted to Blackboard

**Week 11 Due Date: Sunday 05/01**

Worksheet- Building Construction Chapter 4 & 5 Due  
Take Quiz 4 & 5  
Review-PowerPoint Chapter 5  
Readings – Chapter 5  
Discussion Board Three  
Mid-Term-Chapter 1-5 Exam Due  
04/20-04/26

**Week 13 Due Date: Sunday 05/15**

Worksheet- Building Construction Chapter 6 Due  
Take Quiz 6 Chapter 6  
Review-PowerPoint Chapter 6  
Readings – Chapter 6  
Discussion Board four

**Week 15 Due Date: Sunday 05/29**

Worksheet- Building Construction Chapter 7 &8 Due  
Take Quiz 7-8 Chapter 7-8  
Review-PowerPoint Chapter 7-8  
Readings – Chapter 7-8  
No Discussion Due

**Week 17 Due Date: 06/05**

Worksheet- Building Construction Chapter 9 Due  
Take Quiz 9 Chapter 9  
Review-PowerPoint Chapter 9  
Readings – Chapter 9  
Discussion Board five

**Week 18 Due Date: Friday 06/10**

Worksheet- Building Construction Chapter 10 Due  
Take Quiz 9 Chapter 10  
Review-PowerPoint Chapter 10  
Readings – Chapter 10  
Instructor Evaluation  
Final Exam 06/08- 06/10

**Course Schedule Readings**



<b>Class Date</b>	<b>Chapter</b>	<b>Topic</b>	<b>Text Pre-Reading</b>	<b>Homework Assignment</b>
	1	Building Construction and the Fire Service	pp. 9-41	
	2	Structural Fire Resistance and Building Classifications	pp. 45-67	
	3	The Way Buildings are Built: Structural Design Features	pp. 71-103	
	4	Building Systems	pp. 107-146	
	5	Fire Behavior and Building Construction	pp. 151-179	
	6	Foundations	pp. 183-192	
	7	Wood Construction	pp. 197-228	
	8	Masonry & Ordinary Construction		
	9	Steel Construction		
	10	Concrete Construction		

**\*\*\*Subject to change without prior notice\*\*\***