



FIRE-515: BUILDING CONSTRUCTION FOR FIRE PROTECTION (FORMERLY FIRE-115)

Effective Term

Fall 2025

BOT Approval Date

04/11/2024

Discipline

FIRE - Fire Technology

Course Number

515

Course Title

Building Construction for Fire Protection (formerly FIRE-115)

Short Title

Bldg Construction-Fire Protect

Credit Status (CB 04)

D - Credit - Degree applicable

Units

Lecture Units

3.00

Total Units

3.00

Hours

Lecture Contact Hours

48-54

Out of Class Hours Lecture

96-108

Total Contact Hours

48 - 54

Total Out of Class Hours

96 - 108

Total Student Learning Hours

144 - 162

Distance Education

Yes

Distance Education

Distance Education Type

Both Fully Online and Hybrid Online

Fully Online Delivery Requirements:

a. Students must be notified via the college schedule of classes and the syllabus for the class if proctored tests are required for this course



b. Any planned face-to-face meetings, such as an orientation or study session, must be optional

c. The MSJC curriculum committee requires the use of accessible, asynchronous discussion as a component of every fully online course

Are you using publisher content?

No

Regular Substantive Interaction

Instructor-to-student, student-to-student, and student-to-content contact shall be distributed in a manner that will ensure regular substantive interaction (RSI) is maintained not only weekly but also for the duration of the course. Instructor interactions should be equivalent in time, quality and consistency to the engagement students would receive in a face-to-face course—for example, through announcements, discussion participation, personalized feedback, video messages, or other instructional communications. Instructors are expected to be responsive to student inquiries within a 24-72 hour time frame excluding holidays. RSI will be maintained through a variety of methods:

- Orientation - Students must be oriented to the online and face-to-face portions at the start of the course.
- Announcements - Announcements using the course management system must be posted at least weekly to keep students current on course events, due dates, materials, etc.
- Discussion Forums - Content-related discussion forums within the designated CMS will include appropriate instructor participation and will be initiated and maintained, with timely feedback provided. Instructors are required to monitor the discussions and related activities to provide guidance and direction. Open-ended discussion boards may be used to further learning and interaction.
- MSJC Communication – Instructor will use MSJC-administered communication tools (such as email or the designated CMS communication tools) to regularly communicate with and provide ease of access to students.
- Timely Feedback - Timely feedback on student work will be provided by the instructor, which may include comments and/or rubrics, within the Grades area of the designated CMS.
- Scheduled Meetings – Hybrid and synchronous courses will meet at regularly scheduled times. ADA Compliance - All course interactions and content must be designed with accessibility in mind and meet ADA requirements.

Additional Regular Substantive Interaction

The course will meet asynchronously for the fully online version using the CMS to engage with all course materials and complete assignments. Students may be required to create accessible videos with closed captions of [themselves performing or doing something involving course content. Hybrid sections will meet synchronously once a week via teleconferencing meetings as an Online Real-Time course, or as a hybrid course, they will meet fully face-to-face once a week with the rest fully online via the CMS. Students may be required to create accessible videos with closed captions engaging with course content and upload them into the CMS for feedback and to ensure proper understanding and performance of course content, this will be at the discretion of the instructor. Some assignments may be included in a live synchronous meeting via teleconferencing. Students will receive feedback from faculty regarding assignments performed live in synchronous meetings. Testing may occur using the CMS, or in a live classroom for hybrid courses.

Catalog Description

This course studies the components of building construction that relate to fire safety. The elements of construction and design of structures are shown to be key factors when inspecting buildings, preplanning fire operations, and operating at fires. The development and evolution of building and fire codes will be studied in relationship to past fires in residential, commercial, and industrial occupancy. (formerly FIRE-115)

Codes

TOP Code (CB 03)

2133.00* - *Fire Technology

CIP Code

43.0203 - Fire Science/Fire-fighting.

Repeatability Code

No

Grading Option

Letter grade OR P/NP

Learning Objectives

Learning Objectives

Learning Objective

1. Analyze and appraise how technological advancements produce higher levels of emergency safety and survival regarding building construction dangers.
2. Evaluate the concepts of risk management and mitigation as it pertains to emergency services, including strategic and tactical decision making involving ventilation strategies associated with building construction.
3. Organize and display tactical considerations associated with the various types of building construction
4. Determining and recognizing different designations of the building code
5. Formulates the indicators of potential structural failure as they relate to firefighter safety.
6. Explore the function of each principal structural component in a typical building design.
7. Compare and contrast the different loads and stresses that are placed on a building and their interrelationships
8. Analyze major types of building construction in accordance with a local/model building code.
9. Evaluate and describe the need for cultural and behavioral change within the emergency services relating to safety, incorporating leadership, supervision, accountability and personal responsibility when working in a team to identify building codes and regulations.
10. Explore firefighting living arrangements with in the station or work place with regards to personal sexuality and equity.

Learning Outcome Information

Course Learning Outcomes

Learning Outcome

1. The student will analyze the hazards and tactical considerations associated with various types of building construction when involved in fire.
2. The student will describe building construction as it relates to firefighting safety, building codes, fire prevention, code inspections, firefighting strategy, and tactics.
3. The student will identify the function of each principle structural component in typical building design and how it can affect fire behavior.

Program Learning Outcomes

Learning Outcome

Analyze Fire Service theories and techniques as well as conduct research on specific topics related to the Fire Service.

Demonstrate the ability to address problems while working as part of the team.

Develop good oral and written communication skills.

Exhibit a working knowledge of the various aspects of the Fire Service to include but not limited to Fire Department structure, operations, educational and experiential requirements for firefighting jobs.

Use technology to process information to identify and address problems.

Institutional Learning Outcomes

Critical Thinking: The student will analyze problems, gather and synthesize relevant information, evaluate ideas, information, and evaluate alternative points of view to create, innovate and implement effective solutions.

Cultural Awareness and Humility: The student will demonstrate knowledge of and sensitivity toward individuals of diverse ethnicity, age, gender, sexual orientation, and religious affiliations, as well as toward those individuals with diverse abilities and socio-economic classes to respectfully interact with individuals of diverse perspectives, beliefs and values while being mindful of the limitation of their own cultural frameworks.

Scientific Awareness: The student will apply the scientific method of inquiry to assess potential solutions for real-life challenges by employing science-based knowledge and methodologies in daily life.

Social Awareness: The student will recognize and analyze the interconnectedness of global, national, and local concerns, analyzing cultural, political, social, and environmental issues from multiple perspectives and appreciate similarities and differences among cultures.

Civic

Personal

and Professional Responsibility

Content

Course Lecture Content

1. Introduction and history of building construction
 - a. Understand the importance of proper language for building structure components, and techniques to ensure fire ground safety. Governmental functions, building, and fire codes.
2. Identify the role of the Pre-Fire Plan and analysis in firefighting operations.
 - a. Explain why it is important to study reports of past significant fires, examples (After Action Reviews and NIOSH reports)
3. Principles of construction terminology, definitions of building, and occupancy classifications characteristics.
 - a. Establish how occupancy-specific building code requirements dictate particular safety features
 - b. Understand how occupancy specifics affect firefighting operations.
4. Building materials types, fire load Effects, and fire resistance standards.
 - a. Identify the variety of forces to which buildings are subjected.
 - b. Identify the different types of loads and how they are applied to the building structure.
5. Duration Theory vs. Reality Fire Behavior.
 - a. Describe the development of compartment fires in buildings.
 - b. Identify ways fire is influenced by building shapes, components, and characteristics.
6. Describe the features of the different fire protection systems.
 - a. Identify the primary laboratory fire testing equipment and procedures, and what characteristics they assess.
 - b. Describe the various types of fire protection systems, for example, smoke detectors, HVAC systems, Stand Pipes, Sprinkler systems, PIV, and alarm systems.
7. Describe the different types of fire-stopping
 - a. fire retardants and how they are used.
 - b. Different uses regarding foam firefighting tactics.
 - c. Ordinary construction, structural stability, and fire barriers, how they are used in firefighting operations regarding ventilation.
8. Smoke removal, Vertical and horizontal extension.
 - a. Utilization of fire and smoke elevators, atrium/lobbies modifications/code compliance, water salvation, and ventilation.
9. Culture of fire and emergency services
 - a. firefighter survival in fire situations
 - b. emergency service culture
 - i. station life regarding sexual preferences and equality
 - ii. Off-duty life
 - iii. crew accountability on an incident

Methods of Instruction

Method

Group Projects

Integration

Students will be placed in groups to research, analyze, and discuss with classmates the relationship between the five types of building structures in relation to fires. Each group will analyze both interior and exterior structure fires regarding potential life-threatening hazards. Each student group will write one group essay on the differences between the types of interior and exterior structure fires and their life-threatening hazards.

DE Adaptations for MOI

A discussion board will be provided for each student group to work together. On the research analysis and discussion on the five types of building structures in relation to fires The CMS discussion board will be the location for students to share their research and provide feedback. Students can use video with closed caption conferencing tools to work together if they choose to connect in real time. The instructor will participate and provide feedback and more research and information as needed to guide the student work groups in a learning environment.

Method

Discussion

Integration

Explore the differences between sexual preferences regarding social and equitable dynamics of living in the fire station. Examples focus on the need for cultural and behavioral change # 1, Empowerment #4, of the 16 firefighter initiatives, and psychological support for firefighters.

DE Adaptations for MOI

Discussion boards are posted for questions for students who cannot attend live lectures. Lectures can be communicated through CMS in formats including PowerPoint Presentations, accessible and closed-captioned lecture videos, websites, and online videos that can be incorporated as part of the lectures.

Method

Reading

Integration

Students will use the assigned course textbook, NFPA publications, articles, and case studies to attain knowledge of different forms of building construction materials and architecture regarding fire-related hazards and four levels of fire spread regarding conduction, convection, and radiation.

DE Adaptations for MOI

Reading can be provided utilizing the text, and accessible materials provided in the CMS. Some articles and publications may also use asynchronous threaded discussion in discussion boards. Instruction videos can be utilized with close captions accessibility requirements.

Methods of Evaluation**Method**

Class Participation

Integration

Weekly assessment by the instructor of student knowledge in building structures, life-threatening hazards, types of building codes and safety regulations based on the performance of weekly group discussions.

DE Adaptations for MOE

Weekly assessments and instructor feedback are provided during weekly discussion boards or during the class for face-to-face hybrid courses. Periodic written evaluations may be made through the CMS, or verbal evaluation during hybrid sessions or synchronous sessions utilizing the video conferencing tools with closed captions.

Method

Exams/Tests

Integration

At various intervals, students will encounter short objective tests that align with the course's learning objectives. These assessments are designed to be both diagnostic and evaluative, providing students with insights into their progress. Quizzes may take various formats, encompassing objective question types such as multiple-choice, true/false, and fill-in-the-blank, as well as more expansive long-format essays. The aim is to encompass the breadth of learning outcomes within this multifaceted field. These quizzes and exams may undergo grading through manual evaluation or automated processes, utilizing tools such as the course management system (CMS). Quizzes and a final examination will be used to evaluate the student's understanding of terminology, knowledge of the subject matter, and ability to contrast and evaluate types of Building Construction fire situations.

DE Adaptations for MOE

Quizzes will be given within the CMS. Quizzes may be graded manually by the instructor or through the CMS auto-grading system. The instructor will provide correct responses, comments, and grades within two weeks of the due date of these quizzes within the gradebook using the CMS.



Method

Homework

Integration

Studying a case study/report of an actual incident, the student will utilize the 16 fire safety initiatives to recognize unsafe situations regarding building construction, identify alternatives to correct the unsafe situation and determine if a cultural or behavioral change will prevent the unsafe situation from occurring in the future. The student will write a paper on what safety precautions should be initiated.

DE Adaptations for MOE

The student's homework will be submitted via CMS. Rubrics/clear instructions will be provided. Papers will be evaluated through correctness, clarity, completeness, and precision. The student will receive a grade and feedback from the instructor within two weeks of the assignment's due date within the gradebook using the CMS.

Method

Papers

Integration

Write a 1-2 page paper on the discussion that explores the differences between sexual preferences regarding social and equitable dynamics of living in the fire station. Examples focus on the need for cultural and behavioral change # 1, Empowerment and #4, of the 16 firefighter initiatives, and psychological support for firefighters.

DE Adaptations for MOE

Using the discussion board feature in the CMS a one to two-page paper will be requested as an assignment to evaluate the student's ability to address sexual preferences and social dynamics of living in the fire station. The instructor will provide feedback during the discussion board or the grade book within two weeks of the assignment's due date. Periodic written evaluations may be made through the CMS, or verbal evaluation during hybrid sessions or synchronous sessions utilizing the accessible and closed-captioned video conferencing tools.

Assignments**Assignment Type**

Writing

In-class and/or outside of class

Outside of class

Formative or Summative

Formative

Assignment

Assignment Description: Lightweight Truss Hazards During Ventilation Procedure

In a 1-2 page paper, written format, identify and assess the hazards of firefighting operations in buildings with a lightweight truss construction and how to avoid them. Assess the eight indicators of potential structural collapse and prepare a written analysis describing each indicator and how to recognize them during ventilation operations.

Evaluation:

Student submissions will be evaluated on grammatical correctness, clarity, completeness, precision, evidence of understanding, and introspection. The student will receive a grade and feedback from the instructor within two weeks of the assignment's due date within the gradebook using the CMS.

How assignment will be adapted in online format

The assignment will be assigned, submitted, and graded through the course management system (CMS). Online courses should make course material, including assignment instructions, supplemental resources, website links, etc., available to students through the CMS. Students will submit the assignment through the CMS and will be provided with instructor feedback through the grade book



function, messaging, or other forms of confidential communication within 2 weeks of submission. Any material for students and communications must meet accessibility guidelines

Assignment Type

Writing

In-class and/or outside of class

Outside of class

Formative or Summative

Summative

Assignment

Lecture/self-research on what changes are in process regarding the fire service for gender, race, and sexuality. Write a 3-5 page paper on what changes regarding building construction, and codes have occurred in the fire service over the past 20 years. Structural change at the station, and HQ level. Changes have begun regarding dorm rooms, bathrooms, and uniform policies. This includes all firefighters concerning their sexuality.

How assignment will be adapted in online format

The assignment will be assigned, submitted, and graded through the course management system (CMS). Online courses should make course material, including assignment instructions, supplemental resources, website links, etc., available to students through the CMS. Students will submit the assignment through the CMS and will be provided with instructor feedback through the grade book function, messaging, or other forms of confidential communication within 2 weeks of submission. Any material for students and communications must meet accessibility guidelines

Assignment Type

Reading

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

In this reading assignment, you will read and research different classes of Stand Pipes, their differences, and how they are utilized during firefighting operations by reviewing the textbook and National Fire Protection Agency articles. You will right one to two paragraphs of your findings and include a work cited page.

How assignment will be adapted in online format

The reading and writing assignment will be assigned, submitted, and graded through the course management system (CMS). Students will submit the writing portion of the assignment through the CMS and will be provided with instructor feedback through the grade book function, messaging, or other forms of confidential communication within 2 weeks of submission. Any material for students and communications must meet accessibility guidelines. Online courses should make course materials accessible, including assignment instructions, supplemental resources, website links, etc., available to students through the CMS.

Assignment Type

Other

In-class and/or outside of class

In-class

Formative or Summative

Summative

Assignment

Utilizing the discussion that explores the differences between sexual preferences regarding social and equitable dynamics of living in the fire station. Draw a Pre-Plan of how you, foresee the future fire station as it relates to the social dynamic of firehouse living.

How assignment will be adapted in online format

Using the discussion board feature in the CMS a one to two-page Pre-Plan drawing will be requested as an assignment to evaluate the student's ability to address sexual preferences and social dynamics of living in the fire station. The instructor will provide feedback during the discussion board or the grade book within two weeks of the assignment's due date. Periodic written evaluations may be made through the CMS, or verbal evaluation during hybrid sessions or synchronous sessions utilizing the accessible and closed-captioned video conferencing tools.

Course Materials

Textbooks

Brannigan, F. L. and Corbett, G. P. (2021). Brannigan's Building Construction for the Fire Service 6th edition Jones & Bartlett Learning. ISBN: 9781284177312

Class Size Information

Class Size

40

Class Size Category

A - Lecture/discussion 40

Diversity and Inclusion

Explain how diversity and inclusion(e.g., gender, culture/race, sexuality, etc.) is infused into the course.

The students will conduct interviews with full-time firefighters of all different races and genders as part of the student research. This course will show how cultural and behavioral change regarding building construction has occurred in the fire service over the past few years. What changes are in process regarding the fire service for gender, race, and sexuality? Living arrangements in the fire station will be discussed regarding building structural change at the station, and at the headquarters level has begun regarding dorm rooms, bathrooms, and uniform policies. This includes all firefighters concerning their sexuality. Training, and building code policies have been enhanced regarding subjects and different forms of harassment.

Describe how assignments, instruction, evaluation, course content, and interactions are contextualized for diverse learners promoting an equitable course.

Students have equal opportunities to access all learning resources through CMS, and individual support from the instructor via accessible CMS videoconferencing. Accessible and closed caption videos and other forms of media are used to ensure success in the area of DEI. Instruction is provided through accessible recorded/captioned video and in-person lectures. Discussion boards are offered in two different formats - student-to-student and student-to-instructor. Students participate in class via asynchronous discussions in print or accessible/captioned video format using accessible CMS video conferencing software. All PowerPoint or accessible video presentations with closed caption will be uploaded onto Canvas for student use. Exams and/or tests are administered fully online. They are evaluated through CMS. The format for assignments and exams will include multiple choice, short answer essays, video creation and other formats to promote diverse learners for equitable student engagement, and participation. This is in alignment with the learning objectives. All exams/tests must meet accessibility guidelines. Individual student feedback will be provided by the instructor via the CMS within two weeks.

Interactions

Explain how the course will incorporate student-to-student interaction.

Student-to-student interaction will be encouraged by utilizing group discussion boards as a means of evaluation. The conversations serve as a platform for students to connect with their peers, share interpretations of course content derived from lectures and readings, ask questions, and weave personal experiences to converse about the subjects in class. Through the utilization of course management system (CMS) discussion forums, breakout rooms in accessible video-conferencing with closed captions software, and in-class interactions, students come together to collaboratively develop critical approaches and apply theoretical concepts regarding firefighting operations involving building construction.

Explain how the course will incorporate instructor-to-student interaction.

The instructor takes on the crucial task of grading assignments according to a predefined rubric and providing timely and constructive feedback on all assessments. In this capacity, the instructor also moderates discussions on topics such as building codes NFPA hazard regulations, and building code enforcement. To enhance this interaction, faculty members are equipped to provide feedback on student assignments through various avenues, be it accessible video conferencing with closed captions software, the course management system (CMS) grading functionality, or one-on-one meetings with individual students.

Explain how the course will incorporate student-to-content interaction.

Using a wide range of tools to expose students to material, including discussion boards, small group engagements, breakout rooms, and introspective writing opportunities, students will have exposure to a wide variety of perspectives on building construction. Students will participate in class in class discussions in asynchronous discussions using accessible video conferencing with closed captions software. Exams and/ or tests are administered fully online. They will be evaluated through CMS. The format may include multiple choice, short answer, essay, or other formats. Exams/ tests will be evaluated based on the demonstration of identification, and understanding of the applications of major topics examples, NFPA regulations, and 16 firefighter safety initiatives these described in the course content. This is in alignment with the learning objectives. All exams/ tests must meet accessibility guidelines. Instructor feedback will be provided via CMS, within 2 weeks.

Explain how the course will incorporate student-to-self interaction (metacognitive).

The course promotes critical thinking by asking students to reflect on how the material can help prevent injury or property loss during structure fires. Through the reading of the text, lectures, and different activities throughout the course, students will consider different hazard factors that influence fire spread. This knowledge will help improve safety during structure firefighting operations.

Key: 1597