COURSE OUTLINE
Building Construction for the Fire Service

Course Description
FS 130. Building Construction for the Fire Service. 3 hours credit. This course will enable the student to discuss the components of building construction related to firefighter and life safety. The student will gain knowledge of the elements of construction and design of structures that are shown to be key factors when inspecting buildings, preplanning fire operations, and operating at emergencies.

Required Materials
For complete material(s) information, refer to: https://bookstore.butlercc.edu

Butler-assessed Outcomes
The intention is for the student to be able to:
1. Identify various classifications of building construction.
2. Explain theoretical concepts of how fire impacts major types of building construction.

Learning Outcomes
Taken from the National Fire Academy FESHE model Curriculum.
1. Describe building construction as it is related to firefighter safety, building codes, fire prevention, code inspection, firefighting strategy, and tactics.
2. Classify major types of building construction in accordance with local/ model building code.
3. Analyze the hazards and tactical considerations associated with various types of building construction.
4. Explain the different loads and stresses that are placed on a building and their relationships.
5. Identify the function of each principle structural component in typical building design.
6. Differentiate between fire resistance and 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 failures as they relate to firefighter safety.

Learning PACT Skills that will be developed and documented in this course
Through involvement in this course, the student will develop ability in the following PACT skill area(s):

Analytical Thinking Skills
- Critical thinking - Through research and the review of case studies of historical fires, the student will describe relevant principles and concepts of building construction and how fire conditions and fire ground operations affect the structure.
- Problem solving - Through research and review of existing structures and their construction type, the student will develop a better understanding of why and how
structures will react under fire conditions and during fire ground operations.

**Major Summative Assessment Task(s)**
These learning outcome(s) and the Learning PACT skill(s) will be demonstrated by:
1. Completing a research project identifying the components of building construction and their relation to fire ground operations.

**Skills or Competencies**
Actions that are essential to achieve the course outcomes: (The following skills and competencies are taken from the National Fire Protection Association Standards and the Fire and Emergency Services Higher Education Model and incorporated into each specific course.)
A. Principles of construction
   1. Define loads and their imposition
   2. Describe fire load and the rate of heat release
   3. Explain characteristics of various construction materials
   4. Analyze safety factors of materials
   5. Identify structural elements
B. Principles of fire resistance
   1. Describe early fire test
   2. Identify standards for fire resistant construction
C. Flame spread
   1. Identify concept of flame spread
   2. Explain flame testing and rating
D. Smoke and fire containment
   1. Identify hazards of smoke and gasses
   2. Describe horizontal ventilation
   3. Describe vertical ventilation
   4. Identify smoke barriers
   5. Identify fire stops
E. Garden apartments
   1. Identify specific hazards associated with multi-dwellings
   2. Identify construction features of complexes
   3. Analyze fire tactics for suppression activities
F. High rise construction
   1. Identify specific hazards associated with high rise structures
   2. Identify construction features of high rise structures
   3. Analyze fire tactics for suppression activities
G. Type I construction
   1. Identify structures constructed from Type I materials
   2. Identify construction materials classified as Type I
   3. Describe characteristics of Type I materials
   4. Identify hazards of Type I materials under fire conditions
G. Type II construction
   1. Identify structures constructed from Type II materials
   2. Identify construction materials classified as Type II
   3. Describe characteristics of Type II materials
4. Identify hazards of Type II materials under fire conditions

H. Type III construction
   1. Identify structures constructed from Type III materials
   2. Identify construction materials classified as Type III
   3. Describe characteristics of Type III materials
   4. Identify hazards of Type III materials under fire conditions

I. Type IV construction
   1. Identify structures constructed from Type IV materials
   2. Identify construction materials classified as Type IV
   3. Describe characteristics of Type IV materials
   4. Identify hazards of Type IV materials under fire conditions

J. Type V construction
   1. Identify structures constructed from Type V materials
   2. Identify construction materials classified as Type V
   3. Describe characteristics of Type V materials
   4. Identify hazards of Type V materials under fire conditions

**Learning Units**

I. Fundamentals of building construction for the fire service

II. Concepts of construction

III. Methods and materials of construction

IV. Building codes

V. Features of fire protection

VI. Wood frame building construction

VII. Heavy timber building construction

VIII. Ordinary building construction

IX. Non-combustible building construction

X. Fire-resistant building construction

XI. Specific occupancy hazards

XII. Collapse

**Learning Activities**

Activities will include, but not be limited to, class discussions, lectures, classroom exercises, course projects, and field trips.

**Grade Determination**

FS 130 Building Construction for the Fire Service
The student will be evaluated through written exams, skill proficiency assessment, and other methods of evaluation as deemed necessary by the instructor.