

Course Outline of Record

Los Medanos College 2700 East Leland Road Pittsburg CA 94565 (925) 439-2181
Course Title: Building Construction related to the Fire Service Subject Area/Course Number: FIRE-104

New Course OR Existing Course

Instructor(s)/Author(s): Mike Grillo and Don Torres

Subject Area/Course No. FIRE-104

Units: 3

Course Name/Title: Building Construction related to the Fire Service

Discipline(s): Fire Technology

Pre-Requisite(s): None

Co-Requisite(s) None

Advisories: Completion of Fire-101 and 103; Eligibility for ENGL-090

Catalog Description: This course covers fundamentals of building construction as it relates to fire protection. Classification of occupancy and types of construction with an emphasis on fire protection features including building equipment, facilities, and fire resistant materials. This course is required for Public Safety majors at CSUs.

Schedule Description: This course is essential if you want to work in the fire service. You will learn how to assess the safety of a building and determine fire safety features. You will visit actual building sites in teams and use the principles of building and fire codes to determine the structural integrity of buildings in your community.

Hours/Mode of Instruction: Lecture 54 Lab Composition Activity Total Hours 54
(Total for course)

Credit	<input checked="" type="checkbox"/> Credit Degree Applicable (DA)	Grading	<input type="checkbox"/> Pass/No Pass (P/NP)	Repeatability	<input checked="" type="checkbox"/> 0
	<input type="checkbox"/> Credit Non-Degree (NDA)		<input type="checkbox"/> Letter (LR)		<input type="checkbox"/> 1
	(If Non-Credit desired, contact Dean.)		<input checked="" type="checkbox"/> Student Choice (SC)		<input type="checkbox"/> 2
					<input type="checkbox"/> 3

Please apply for: LMC General Education Requirement and/or Competency & Graduation Requirement(s): None

Transfer to: CSU UC IGETC LDTP Course is Baccalaureate Level: Yes No

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Signatures:

Department Chair _____ Date _____
Librarian _____ Date _____
Dean/Sr. Dean _____ Date _____
Curriculum Committee Chair _____ Date _____
President/Designee _____ Date _____
CCCCD Approval Date (Board or Chancellor's Office) _____ Date _____

For Curriculum Committee Use only:

STAND ALONE COURSE: YES NO

FOR OFFICE OF INSTRUCTION ONLY. DO NOT WRITE IN THE SECTION BELOW.

Begin in Semester _____ Catalog year 20 ____/20 ____ Class Max: _____
Dept. Code/Name: _____ T.O.P.s Code: _____ Crossover course 1/ 2: _____
ESL Class: Yes / No DSPS Class: Yes / No Coop Work Exp: Yes / No
Class Code SAM Code Remediation Level

<input type="checkbox"/> A Liberal Arts & Sciences	<input type="checkbox"/> A Apprenticeship	<input type="checkbox"/> B Basic Skills
<input type="checkbox"/> B Developmental Preparatory	<input type="checkbox"/> B Advanced Occupational	<input type="checkbox"/> NBS Not Basic Skills
<input type="checkbox"/> C Adult/Secondary Basic Education	<input type="checkbox"/> C Clearly Occupational	
<input type="checkbox"/> D Personal Development/Survival	<input type="checkbox"/> D Possibly Occupational	
<input type="checkbox"/> E For Substantially Handicapped	<input type="checkbox"/> E* Non-Occupational	
<input type="checkbox"/> F Parenting/Family Support	<input type="checkbox"/> F Transfer, Non-Occupational	
<input type="checkbox"/> G Community/Civic Development	<u>*Additional criteria needed</u>	
<input type="checkbox"/> H General and Cultural	<input type="checkbox"/> 1 One level below transfer	
<input type="checkbox"/> I Career/Technical Education	<input type="checkbox"/> 2 Two levels below transfer	
<input type="checkbox"/> J Workforce Preparation Enhanced	<input type="checkbox"/> 3 Three levels below transfer	
<input type="checkbox"/> K Other non-credit enhanced		
<input type="checkbox"/> Not eligible for enhanced		

Course approved by Curriculum Committee as Baccalaureate Level: Yes / No

LMC GE or Competency Requirement Approved by the Curriculum Committee: _____

Distribution: Original: Office of Instruction
Copies: Admissions Office, Department Chairperson
Rev 09-17-2008

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Institutional Student Learning Outcomes

General Education SLOs (Recommended by GE Committee)

At the completion of the LMC general education program, a student will:

1. Read critically and communicate effectively as a writer and speaker.
2. Understand connections among disciplines and apply interdisciplinary approaches to problem solving.
3. Think critically and creatively
4. Consider the ethical implications inherent in knowledge, decision-making and action.
5. Possess a worldview informed by diverse social, multicultural and global perspectives.

Occupational Education SLOs (Recommended by Occupational Education Committee)

At the completion of the LMC occupational certificate or degree, a student will:

1. Be academically prepared to **obtain an entry-level or a mid-level position** in their industry.
2. Apply **critical thinking** to research, evaluate, analyze and synthesize information.
3. Demonstrate strong **communication skills** (written and/or oral) and **interpersonal skills** (customer service and team work).
4. Appropriately apply **industry materials and technology**.
5. Demonstrate the skills and knowledge necessary to take and pass **certification exams** for career **advancement** in their industry.

Developmental Education SLOs (Recommended by Developmental Education Committee)

At the completion of the LMC Developmental Education Program, a student will:

1. Demonstrate the skills necessary for the first transfer level courses in English and Math or for the English and Math competencies for the Certificate of Achievement.
2. Think critically to construct meaning and solve problems.
3. Read with comprehension.
4. Communicate effectively both in writing and orally.
5. Demonstrate the characteristics, habits, and attitudes of an effective learner.

Student Services SLOs

1. LMC students will demonstrate proficiency in the use of college on-line services.
2. LMC students will demonstrate proficiency in self-advocacy.

Library and Learning Support Services SLOs

LMC students utilizing various Library and Learning Support Services will:

1. Access and effectively utilize available campus Library and Learning Support Services.
2. Apply knowledge learned and competencies gained from using Library and Learning Support Services to academic coursework and assignments.
3. Demonstrate information competency skills needed to meet the research demands of academic course work and life long learning.

None of the Above

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Program-Level Student Learning Outcomes (PSLOs)

- 1) Be academically prepared to obtain an entry-level position as a Firefighter in the Fire Service. (OESLO 1)
- 2) Apply critical thinking to research, evaluate, analyze and synthesize Fire Service information. (OESLO 2)
- 3) Demonstrate through written and oral communication skills a broad knowledge of Fire History, Fire Chemistry and Behavior, Fire Prevention and Building Construction as it applies to Firefighting. (OESLO 3)
- 4) Appropriately apply the Fire Technology based information attained in this degree for success in the Fire Service. (OESLO 4)
- 5) Apply the skills and knowledge from this degree towards potential advancement in the Fire Service. (OESLO 5)

Course-Level Student Learning Outcomes (CSLOs)

At the end of the course students will be able to:

CSLO 1: Use the Uniform Building Code and the Uniform Fire Code to determine the type of construction and the fire safety features of the building (PSLO 1, 2 and 3)

CSLO 2: Appraise the structural conditions of a building to determine whether it is safe to enter or work within the building and identify the critical collapse zones (PSLO 1, 2, 5)

CSLO 3: Identify the components and materials of a building and determine the structural fatigue factor (PSLO 2, 3)

Assessments:

	<i>Homework</i>	<i>Quizzes</i>	<i>Midterm</i>	<i>Project</i>	<i>Fire Scenarios</i>	<i>Site Visit Reports</i>	<i>Final</i>
CSLO 1	X	X	X			X	X
CSLO 2					X		
CSLO 3	X			X		X	

CSLO 1:

Homework: Weekly students have a reading assignment from the, Building Construction Related to the Fire Service Manual, and turn in answers to question that relate to the manual and class lecture. This allows students to demonstrate their knowledge of building construction materials, features and fire detection systems which is necessary to understand the Uniform Building and Fire Codes.

Site Visit Reports: In teams student visit 5 building construction sites representing each type of construction (fire resistive, masonry, heavy timber, light weight and ordinary). Students refer to both the Uniform Building and Fire Codes to determine the type of construction and the fire safety features of the building. Students write a report detailing their findings and present their findings to class. This assignment allows students to use both the Uniform Building and Fire Codes to assess actual buildings.

Quizzes, Midterm and Final: Students read the Uniform Build Code and Uniform Fire Code and these Codes are also discussed in class. Students are tested via the quizzes, midterm and final on their knowledge of the information contained in these codes.

CSLO 2:

Fire Scenarios: Throughout the course students are given building scenarios and actual photographs of problematic buildings. Working in small teams the students' task is to appraise the structural conditions of a building to determine whether it is safe to enter or work within the building and identify the critical collapse zones. Students document their discussions and decisions in a notebook which the professor evaluates on a regular basis.

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CSLO 3:

Homework: In homework assignments students identify specific building materials and components used in the five types of construction (fire resistive, masonry, heavy timber, light weight and ordinary). This allows the students to demonstrate their ability to both identify construction materials and components and relate them to the type of building construction.

Site Visit Reports: In teams students visit 5 building construction sites representing each type of construction (fire resistive, masonry, heavy timber, light weight and ordinary). Students identify the components and materials of the building and determine the structural fatigue factor. Students write a report detailing their findings and present their findings to class. This assignment allows students to recognize the actual building components and materials used and use this information to assess structural fatigue.

Project: Students work in teams and choose a building they want to profile. Students obtain permission to profile the building and research the written information regarding the building such as blueprints and permits. Then students identify the building components and the structural fatigue factors and record their observation on either videotape or photographs. Students write a 5 page report regarding their findings including the structural integrity of the building and explain how the building components relate to the structural integrity of the building. Students orally present their findings regarding the building.

Method of Evaluation/Grading:

A level student work is characterized by: Homework assignments that are turned in on time and questions regarding the chapters covered are answered with detail and accuracy and students accurately identify and specifically describe building materials and components; quizzes, midterm and final where students score a minimum of 90%; A project that includes a written report that provides an accurate, specific and detailed description of the components of the building and refers to the records of the building and the building and fire code as well as includes a thorough analysis of the structural integrity of the building; the oral report includes photographs or videotape footage that supports the findings regarding the structural components and integrity of the building and is presented clearly, accurately and with detail; fire scenarios where students accurately describe what they see and predict reasonable outcomes that are supported by insightful analysis of the current and projected structural condition of the building; and five completed site visits that include a written and oral report that accurately identifies building components and fire safety features by referring to both the building and fire codes.

C level student work is characterized by: Homework assignments questions regarding the chapters covered are answered with minimal detail and students identify and describe building materials and components with 70% to 79% accuracy; quizzes, midterm and final where students score between 70% to 79%; A project that includes a written report that provides a description of the components of the building related to the building and fire code and includes an analysis of the structural integrity of the building; the oral report includes photographs or videotape footage that supports the findings regarding the structural components and integrity of the building; fire scenarios where students accurately describe what they see and predict reasonable outcomes; and 3 completed site visits that include a written and oral report that accurately identifies building components and fire safety features.

Homework Assignments	<i>Points worth:200</i>
Quizzes	<i>Points worth:100</i>
Midterm	<i>Points worth 100</i>
Final Exams	<i>Points worth:100</i>
Class Project	<i>Points worth:200</i>
Fire Scenarios	<i>Points worth:200</i>
Site Visits	<i>Points worth 250</i>
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Total Points: 1150	

CSLOs are weighted:

CSLO 1: 45%
CSLO 2: 18%
CSLO 3: 37%

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Course Content:

PRINCIPLES OF CONSTRUCTION

Definitions of loads forces and reactions on columns, beams and other structural elements

OCCUPANCY CLASSIFICATION

Fire and life safety hazards and construction requirements based on building uses and location on property (exposure protection).

CLASSIFICATION BY TYPES OF CONSTRUCTION

Codification of construction types UBC & NFPA

WOOD CONSTRUCTION

The effect of fire of conventional and lightweight wood frame constructions.

MASONRY, TILT-UP CONCRETE

The effects of fire and collapse potential of constructions that utilize NC/FR walls with combustible floors and roofs.

HEAVY TIMBER CONSTRUCTION

Effects of fire and structural collapse potential on construction types of buildings built prior to WWII

PRINCIPLES OF FIRE RESISTANCE (ENDURANCE), FIRE BEHAVIORS OF INTERIOR FINISHES IN BUILDINGS

Ratings of fire resistance and special hazards of interior finishes that give off hazardous smoke when burning.

STEEL CONSTRUCTIONS

The fire problems of steel in construction NC and NC/FR buildings.

CONCRETE CONSTRUCTIONS

Fire and collapse problems of concrete escape towers (stairs), ventilation problems of high rise fires, need for booster pumps at higher floors, elevator problems.

HIGH RISE CONSTRUCTION AND SMOKE MOVEMENT IN BUILDINGS

Fire and smoke problems Escape towers(stairs), ventilation problems of high rise buildings elevator problems.

ELECTRICAL SYSTEMS IN BUILDINGS

Conductors, insulation, wire sizes, types and capacitors, over current protection grounding, grounds, bonding, service entrance, raceways and cables.

Instructional Methods:

- Lecture
- Lab
- Activity
- Problem-based Learning/Case Studies
- Collaborative Learning/Peer Review
- Demonstration/Modeling
- Role-Playing
- Discussion
- Computer Assisted Instruction
- Other (explain) Site Visits

Textbooks:

Building Construction related to the Fire Service Manual, G. P. Carlson, IFSTA Publication, 1999