

2011-13 Cal Poly Catalog

College of Engineering

MS FIRE PROTECTION ENGINEERING

General Characteristics

The profession of Fire Protection Engineering is directed toward the identification, analysis and mitigation of fire hazards and risks across a broad spectrum of applications, including buildings, consumer products, industrial processes, transportation vehicles, infrastructure facilities and the wildland-urban interface.

A pilot program, the Master of Science in Fire Protection Engineering prepares individuals to assess and reduce the potential for property and human loss from fire in these and other settings. Students learn to analyze how buildings are used, how fires start, how fires grow, and how fire and smoke affect people, buildings and property. Fire protection engineers use the latest engineering and construction technologies to:

- Design systems that control fires, alert people to danger and provide means for escape;
- Evaluate buildings to identify fire risks of and the means to prevent or mitigate them;
- Conduct fire safety research on consumer products and construction materials; and
- Investigate fires to discover how fires start, how they spread, why protective measures fail, and how those measures could be designed more effectively.

To meet these program goals, the fire protection engineering curriculum requires that students successfully complete a total of 45 units including a fire protection engineering project as the culminating experience (FPE 596). The culminating experience will be innovative and require independent thinking. Typically, the students will perform a detailed fire and life safety evaluation of a selected building, the preparation of a comprehensive report documenting the results of this evaluation and the presentation of their analysis and findings in an oral defense to a review committee. Other innovative culminating experiences of similar scope and complexity may be submitted for approval.

Program Goals

The Fire Protection Engineering program is designed to build on the skills, knowledge, and broad engineering principles students acquire in an undergraduate engineering program. The required and elective courses composing the Master of Science degree in Fire Protection Engineering address the specific body of knowledge required by the fire protection engineering profession. Students completing the program will possess the technical knowledge, skills and tools required to practice fire protection engineering in a variety of local, national and international settings. Upon completion of this program, students should possess the

necessary knowledge and skills to pursue professional certification and licensure in the fire protection engineering discipline. Furthermore, the program addresses unique fire challenges faced by California and other western states, including wildland-urban interface fires and post-earthquake fires. Upon completing the requirements for a Master of Science degree in Fire Protection Engineering, students should be able to:

- a) Identify relevant fire safety codes, standards and regulations, comprehend the fire safety performance objectives and criteria associated with these documents, and apply these fire safety objectives and criteria to a broad range of applications.
- b) Analyze the flammability characteristics of different materials, interpret the results of standard and non-standard fire test methods and evaluate the fire hazards associated with different materials in a range of anticipated settings.
- c) Analyze the dynamics of fires in and around buildings and other structures through the application of fundamental principles and the use of state-of-the-art computer-based fire simulation models.
- d) Understand how people interact with fire conditions in buildings and calculate evacuation times through the application of fundamental principles of people movement and the use of state-of-the-art computer-based evacuation models.
- e) Design fire detection and alarm systems, fire suppression systems, smoke management systems, egress systems and structural fire protection to achieve specified performance objectives.
- f) Perform comprehensive fire and life safety evaluations of buildings and other structures through application of the knowledge, skills and tools acquired in this program and effectively communicate the results and findings of such evaluations.

Prerequisites

For admission as a classified graduate student, an applicant should hold a bachelor's degree in engineering or a closely related field from a regionally accredited institution, college, or university. An undergraduate grade point average of 3.0 is required. On occasion, where other credentials are exceptionally strong, a GPA in the 2.5-3.0 range may be accepted.

Tuition and Fees

As a special session program through Continuing Education and University Outreach, the MS Fire Protection Engineering program is administratively and academically completely self-supporting. As such, the program carries a separate tuition and fee schedule. Please refer to www.fpe.calpoly.edu/cost.html for the current cost of the program.

MS FIRE PROTECTION ENGINEERING

	<i>Units</i>
Core Courses	37
FPE 501 Fundamental Thermal Sciences (4)	
FPE 502 Fire Dynamics (4)	
FPE 503 Flammability Assessment Methods (4)	
FPE 504 Fire Modeling (4)	
FPE 521 Egress Analysis and Design (4)	
FPE 522 Fire Detection, Alarm and Communication Systems (4)	
FPE 523 Water-based Fire Suppression (4)	
FPE 524 Structural Fire Protection (4)	
¹ FPE 596 Culminating Experience in Fire Protection Engineering (5)	
Technical electives	8
<i>Select 8 units from the following:</i>	
FPE 551 Fire Safety Regulation and Management (4)	
FPE 552 Smoke Management and Special Hazards (4)	
FPE 554 Forensic Fire Analysis (4) (12/26/12)	
FPE 555 Fire Protection Management in the Wildland-Urban Interface (WUI) (4) (11/1/12)	
ME 541 Advanced Thermodynamics (4)	
ME 554 Computational Heat Transfer (4)	
NR 455 Wildland-Urban Interface Fire Protection (3)	

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¹ FPE 599 (9 units) may substitute for FPE 596 and 4 units of technical electives. (12/26/12)