

2011-13 Cal Poly Catalog

College of Engineering

FPE–FIRE PROTECTION ENGINEERING

FPE 500 Individual Study (1-4)

Advanced study planned and completed under the direction of a member of the program faculty. Open only to graduate students in the FPE program who have demonstrated ability to do independent work. Prerequisite: Consent of graduate coordinator and supervising faculty member. FPE 500 must be taken as a 4-unit class when substituting for a required course in the FPE program.

New course, effective Spring 2012.

FPE 501 Fundamental Thermal Sciences (4)

Introduction to the thermal sciences, including thermodynamics, fluid dynamics and heat transfer, as they relate to fire protection engineering. Includes 1st and 2nd laws of thermodynamics, conservation relations, hydrostatics, internal and external flows, and heat transfer by conduction, convection and radiation. 4 lectures. Prerequisite: Graduate standing or consent of instructor.

FPE 502 Fire Dynamics (4)

First exposure to fire dynamics phenomena. Includes fundamental fire and combustion topics such as thermodynamics of combustion, fire chemistry, premixed and diffusion flames, ignition, burning of liquids and solids, heat release rates, flame spread and fire plumes. 4 lectures. Prerequisite: FPE 501 or consent of instructor.

FPE 503 Flammability Assessment Methods (4)

Characterization of flammability properties of gaseous, liquid and solid materials. Fire test methods for evaluating flammability properties of materials and burning characteristics of products. Overview of regulatory requirements for restricting the flammability of products and materials used in buildings. 4 lectures. Prerequisite: FPE 502.

FPE 504 Fire Modeling (4)

Fire modeling techniques for fire safety assessment. Application of various engineering correlations and computer-based fire models, including zone models and computational fluid dynamics models, to representative fire problems. 4 lectures. Prerequisite: FPE 502, FPE 503.

FPE 521 Egress Analysis and Design (4)

Regulatory requirements for egress systems in buildings, including occupancy classifications, occupant loads, means of egress components and exit capacities. Introduction to human behavior in fire and to methods for calculating people movement under emergency conditions, including computer-based evacuation models. 4 lectures. Prerequisite: Graduate standing or consent of instructor.

FPE 522 Fire Detection, Alarm and Communication Systems (4)

Analysis of the operating characteristics of fire detection devices and alarm notification appliances. Introduction to modern fire alarm systems and components. Introduction to mass communication systems. Current installation and approval standards. 4 lectures. Prerequisite: Graduate standing or consent of instructor.

FPE 523 Water-based Fire Suppression (4)

Analysis and design of water-based fire suppression systems, including water supply analysis and hydraulic calculations. Overview and design considerations for automatic sprinkler, water spray, water mist and foam suppression systems. Typical contemporary installations and current installation and approval standards. 4 lectures. Prerequisite: FPE 501 or consent of instructor.

FPE 524 Structural Fire Protection (4)

Regulation and analysis procedures for structural components of wood, steel, concrete, composites. Structural capabilities, modifications under fire induced exposures. Calculation methods for predicting fire resistance of structural components. Definition of types of building construction. 4 lectures. Prerequisite: Graduate standing or consent of instructor.

FPE 551 Fire Safety Regulation and Management (4)

Use of model building and fire codes, administrative regulation, retrospective codes, performance-based codes, and risk-based regulation to manage fire safety. Identification and application of different fire risk management tools and techniques. 4 lectures. Prerequisite: Graduate standing or consent of instructor.

FPE 552 Smoke Management and Special Hazards (4)

Analysis and design of smoke management systems. Assessment of smoke hazards. Identification of special hazards. Analysis and design of fire suppression systems used for fire control of special hazards, including gaseous and chemical agents and systems. 4 lectures. Prerequisite: FPE 502 and FPE 504.

FPE 554 Forensic Fire Analysis (4)

Introduction to the processes of fire investigation and reconstruction. Engineering analysis of structural and wildland fires. Identification of failure mechanisms in fire safety systems. Case studies of actual fire incidents to address and reinforce concepts related to different types of system and performance failures. 4 lectures. Prerequisite: Consent of graduate coordinator and instructor. Recommended: FPE 502, FPE 503 and FPE 504. *New course, effective Summer 2012.*

FPE 555 Fire Protection Management in the Wildland-Urban Interface (WUI) (4)

Social, economic, political, and technological issues affecting fire management in urbanized landscapes where fire continues its ecological role. Fire risk analysis; needs assessment, legislative codes, standards and policies; liability issues; evacuation; incident response planning. 3 lectures, 1 laboratory. Prerequisite: Graduate standing or consent of instructor. Recommended: LA/NR 318 and NR 340. *New course, effective Winter 2013.*

FPE 596 Culminating Experience in Fire Protection Engineering (2-5)

Performance of comprehensive fire and life safety evaluations of buildings and other structures. Communication of the results and findings of such evaluations in written report and by oral presentation. Conducted under supervision of faculty. Total credit limited to 5 units. Prerequisite: FPE 504, advanced graduate standing, completion of, or concurrent enrollment in, engineering courses in program, and consent of instructor.

FPE 599 Design Thesis (1-9)

Each individual will be assigned a thesis project for solution under faculty supervision as a requirement for the master's degree, culminating in a written thesis. Prerequisite: Consent of graduate coordinator and graduate standing. *New course, effective Spring 2012.*