FIRE & SAFETY ENGINEERING (FSE)

FSE 101. Fire Prevention. (3 Credits)
A. An introduction to fire and safety related codes; fire prevention methods; mechanical systems; and engineering solutions for hazards. An in-depth look at the Life Safety Code, the function and testing of fire related building components.

FSE 120. Fire Behavior and Combustion. (3 Credits)
A. Introduction to the chemistry and dynamics of fire; including basic terminology and concepts that are applied to the physical and chemical properties of the development and spread of fire in a structure; hazardous materials and the Computer Fire Analysis.

FSE 201. Building Construction. (3 Credits)
A. A review of the analysis of building construction methods and terminology. A systems approach to designing building fire safety; the Life Safety Code; the function of and testing of rated building components, evaluating plans for code compliance.

FSE 201S. Building Construction. (3 Credits)
A. A review of the analysis of building construction methods and terminology using a service learning approach. A systems approach to designing building fire safety; the Life Safety Code; the function of and testing of building components, evaluating plans for code compliance. Credit will not be awarded for both FSE 201 and FSE 201S.

FSE 221. Fire Detection and Suppression Systems. (3 Credits)
A. Prerequisites: FSE 101, FSE 120. Introduction to fire detection, protection,control systems and extinguishment. Fixed and portable systems of the following types will be studied: automatic sprinklers, standpipes, dry chemical, foam, halogenated agents, fire alarm systems and diction.

FSE 223. Fire and Emergency Scene Operations. (3 Credits)
A. Prerequisite: FSE 201 or FSE 201S. Principles of Incident Management including emergency scene decisions, strategies, and tactics. Utilizing emergency control resources such as personnel, apparatus, and equipment.

FSE 224. Human Behavior In Fire. (3 Credits)
Prerequisites: FSE 101 and FSE 120. Examine current and past research on human behavior, systems models, life safety education and building design to determine interactions emergency situations. Develop a best practice building life safety system.

FSE 225. Legal Aspects of Fire Protection. (3 Credits)
A. A study of legislative and legal decisions relating to personnel practices, employee safety, and public protection. Emphasizes the legal responsibilities, liabilities, and authority of the fire service practitioner.

FSE 230. Fire Prevention Organization and Management. (3 Credits)
A. Prerequisite: FSE 101. An introduction to management issues related to fire prevention systems. Overview of the requirements for fire prevention codes, managing inspections, relations with public and officials and implementation of fire education programs.

FSE 250. Introduction to Explosion Investigations and Bombings. (3 Credits)
A. Introduction to explosion investigations and bombings. Topics include a historical overview of terrorism statutes, sources of information, the federal role in explosion investigation, explosives and improvised explosive devices.

FSE 260. Proving Criminal Acts. (3 Credits)
A study of crimes and the methodical steps in the investigation and proving of criminal acts. Explore defenses/legal remedies to enable the student to understand the obligations of managing an investigation.

FSE 280. Constitutional Criminal Procedure. (3 Credits)
Examines the legal implications of obtaining evidence directly from the suspect. Fourth, Fifth, and Sixth Amendments, and rules of evidence are discussed as they relate to the investigation of criminal acts.

FSE 300. Technical Report Writing for Emergency Services. (3 Credits)
A. Prerequisite: ENG 102. Develop oral and written communication skills specific to the public emergency service sector's needs. Focusing on the technical aspects involved in supporting public initiatives operating within the legal system and learning the specific requirements for submitting documentation to various technical committees. Credit will not be awarded to students who have credit for FSE 300 and 300W.

FSE 300W. Technical Report Writing for Emergency Services. (3 Credits)
A. Prerequisite: ENG 102. Develop oral and written communication skills specific to the public emergency service sector's needs. Focusing on the technical aspects involved in supporting public initiatives operating within the legal system and learning the specific requirements for submitting documentation to various technical committees. Credit will not be awarded to students who have credit for FSE 300 and 300W.

FSE 305. Fire Protection and Hazardous Materials. (3 Credits)
A. Prerequisite: FSE 120. Study of hazardous material problems in transportation, storage, and use. Chemical properties relating to specific reactions, engineering controls, and control in an emergency situation. Emphasis on the role of pre-emergency planning, combating, coordinating, and controlling a hazardous materials incident.

FSE 310. WMD/Hazardous Materials. (3 Credits)
A. Study of different Weapons of Mass Destruction (WMD) materials, deployment, and use. Evaluation of hazardous materials, usage, storage, and transportation. Preventing and controlling WMD/Hazardous Materials incidents.

FSE 320. Principles of Emergency Services. (3 Credits)
A. An overview of organizational and management practices in the fire and safety fields. Emphasis on supervision and leadership styles, motivation, morale, and organizational behavior.

FSE 322. Water-Based Fire Protection Systems Design. (3 Credits)
A. Prerequisite: FSE 221. Analysis and evaluation of specific code requirements related to the design, inspection, testing and maintenance of water-based fire protection systems. Design projects will be included.

FSE 330. Principles of Criminal Investigation. (3 Credits)
Prerequisites: FSE 300 or FSE 300W, FSE 260, and FSE 280. A detailed study of the investigative procedure as it applies to fire, arson, explosion and other personal property crimes.

FSE 349. Applied Learning in Fire and Safety Engineering. (0.5-8 Credits)
A. Prerequisite: departmental approval. Work in placements related to academic studies. One to eight hours credit per semester or summer. Total hours: eight, associate; sixteen, baccalaureate. A minimum of 80 hours employment required for each semester hour credit. Credit will not be awarded for both FSE 349 and OSH 349.

FSE 349A. Cooperative Study: Fire and Safety Engineering. (0.5-8 Credits)
A. Prerequisite: departmental approval. Work in placements related to academic studies. One to eight hours credit per semester or summer. Total hours: eight, associate; sixteen, baccalaureate. A minimum of 80 hours employment required for each semester hour credit. Credit will not be awarded for both FSE 349 A-N and OSH 349 A-N.

FSE 349B. Cooperative Study: Fire and Safety Engineering. (0.5-8 Credits)
A. Prerequisite: departmental approval. Work in placements related to academic studies. One to eight hours credit per semester or summer. Total hours: eight, associate; sixteen, baccalaureate. A minimum of 80 hours employment required for each semester hour credit. Credit will not be awarded for both FSE 349 A-N and OSH 349 A-N.

FSE 349C. Cooperative Study: Fire and Safety Engineering. (0.5-8 Credits)
A. Prerequisite: departmental approval. Work in placements related to academic studies. One to eight hours credit per semester or summer. Total hours: eight, associate; sixteen, baccalaureate. A minimum of 80 hours employment required for each semester hour credit. Credit will not be awarded for both FSE 349 A-N and OSH 349 A-N.

FSE 349D. Cooperative Study: Fire and Safety Engineering. (0.5-8 Credits)
A. Prerequisite: departmental approval. Work in placements related to academic studies. One to eight hours credit per semester or summer. Total hours: eight, associate; sixteen, baccalaureate. A minimum of 80 hours employment required for each semester hour credit. Credit will not be awarded for both FSE 349 A-N and OSH 349 A-N.

FSE 349E. Cooperative Study: Fire and Safety Engineering. (0.5-8 Credits)
A. Prerequisite: departmental approval. Work in placements related to academic studies. One to eight hours credit per semester or summer. Total hours: eight, associate; sixteen, baccalaureate. A minimum of 80 hours employment required for each semester hour credit. Credit will not be awarded for both FSE 349 A-N and OSH 349 A-N.

FSE 349F. Cooperative Study: Fire and Safety Engineering. (0.5-8 Credits)
A. Prerequisite: departmental approval. Work in placements related to academic studies. One to eight hours credit per semester or summer. Total hours: eight, associate; sixteen, baccalaureate. A minimum of 80 hours employment required for each semester hour credit. Credit will not be awarded for both FSE 349 A-N and OSH 349 A-N.

FSE 349G. Cooperative Study: Fire and Safety Engineering. (0.5-8 Credits)
A. Prerequisite: departmental approval. Work in placements related to academic studies. One to eight hours credit per semester or summer. Total hours: eight, associate; sixteen, baccalaureate. A minimum of 80 hours employment required for each semester hour credit. Credit will not be awarded for both FSE 349 A-N and OSH 349 A-N.

FSE 349H. Cooperative Study: Fire and Safety Engineering. (0.5-8 Credits)
A. Prerequisite: departmental approval. Work in placements related to academic studies. One to eight hours credit per semester or summer. Total hours: eight, associate; sixteen, baccalaureate. A minimum of 80 hours employment required for each semester hour credit. Credit will not be awarded for both FSE 349 A-N and OSH 349 A-N.

FSE 349J. Co-op or Appl Lrn: Fire/Safety. (1-8 Credits)
A. Prerequisite: departmental approval. Work in placements related to academic studies. One to eight hours credit per semester or summer. Total hours: eight, associate; sixteen, baccalaureate. A minimum of 80 hours employment required for each semester hour credit. Credit will not be awarded for both FSE 349 A-N and OSH 349 A-N.

FSE 350. Fire Arson and Explosion Investigation. (3 Credits)
A. Prerequisite: FSE 120. An in depth study in the analysis of fire, arson, and explosion scenes. Emphasis will be placed on the principles and techniques of scene preservation and analysis, management of investigative functions, documentation of the scene, and determination of the cause and origin of fire.

FSE 355. Fire Dynamics. (3 Credits)
A. Prerequisites: CHE 101 or higher, FSE 120, and MAT 114. An introduction to fire-related measurement techniques, advanced fire and combustion concepts and associated terminology. This courses includes basic numerical methods for understanding fire dynamics.

FSE 360. Fire Protection Hydraulics and Water Supply. (3 Credits)
A. Prerequisites: FSE 120 and MAT 107 or higher. A study of water at rest and in motion, Bernoulli's and Pascal's theorems; water distribution systems, velocity, friction loss, pump and nozzle pressures required for fire protection.

FSE 365. Instructional Methodology for Emergency Service. (3 Credits)
A. Course provides students with opportunities to develop presentation skills used in classroom instruction. Develop lesson plans, prepare audio-visual aids and props for the class. Prepare evaluation methodologies that competently assure learning objectives during delivery of presentations.

FSE 370. Electrical and Mechanical Systems Failure Analysis. (3 Credits)
A. Overview of design criteria for electrical and mechanical systems and components relative to fire safety via laboratory experiments, exemplar components and photographs that depict system and component failures that result in fire. Learning opportunities include engaging in destructive and nondestructive analysis of components and systems.

FSE 375. Emergency Services Resource Management. (3 Credits)
A. Introduction to management issues related to obtaining and accounting for resources. Included are financial management processes, acquisition strategies, strategies for maintenance of effort and resource prioritization, resource replacement planning and processes to audit program success.

FSE 380. Failure Analysis. (3 Credits)
A. Prerequisite: FSE 370. An in-depth study of fire and arson investigations. Emphasis will be placed on the principles and techniques of scene preservation, failure analysis, report writing, and determination of cause and origin.

FSE 400. Advanced Emergency Services. (3 Credits)
A. Prerequisites: FSE 300 or FSE 300W and 320. A study of environmental management including the identification and analysis of key managerial issues confronting contemporary fire services managers. Application in current methods and planning, organizing, developing and evaluating public fire/emergency services organizations.

FSE 425. Disaster & Community Fire Defense Planning. (3 Credits)
A. Prerequisite: FSE 300 or FSE 300W. Overview of the ever changing demographics of the departmental jurisdictions and response during community service master planning, identifying hazards then assessing risks associated with those hazards. Analysis of potential disaster and recovery methods.

FSE 445. Advanced Structural Fire Protection. (3 Credits)
Prerequisite: FSE 355 (C). Examines principles involved in structural fire protection: behavior of materials and design considerations for each material in regards to a structure's design under fire attack and resistive protection methods.

FSE 450. Advanced Explosion and Bombing Investigation. (3 Credits)
A. Prerequisite: FSE 250 and FSE 380. An in-depth study of explosion scene investigation. Emphasis will be placed on the principles and techniques of scene preservation analysis, management of investigative functions, documentation of scene, and determination of the cause of explosions.

FSE 480. Industrial Fire Safety. (3 Credits)
Prerequisites: FSE 101, FSE 120 and FSE 360. Fire scenario analyses for industrial installations using test data, loss experience and simplified theoretical modeling focusing on warehousing, storage of flammable liquids and safety of electrical equipment and computers.

FSE 481. Fire Protection Design. (3 Credits)
Prerequisite: FSE 445. Comprehensive project emphasizing a team approach to the design process. Problem formulation; project management; drawings and specifications; cost estimating; and various project components. Engineering and professional ethics.

FSE 489. Topical Seminar:___. (1-3 Credits)
A. Prerequisite: Departmental approval. Development and presentation of research in contemporary methods, techniques, and devices in the field. May be retaken under different topics to a maximum of 12 hours.

FSE 490. Fire/Safety Research & Evaluat. (3 Credits)
A. Prerequisite: senior standing. Development of competency relating to concepts of fire and safety research analysis. Each student develops a research design and carries out a study project. Individual studies are culminated with project paper and presentation.

FSE 495. Fire Arson and Explosion Case Preparation. (3 Credits)
A. Prerequisite: FSE 450. Preparation of the fire, arson, and explosion case for trial, including preparation of demonstrative evidence, scene documentation for presentation, rules of evidence, case review and analysis, and testimony.

FSE 496. Fire Investigation Case Preparation. (3 Credits)
Prerequisite: FSE 450. Preparation of the fire and arson case for trial, including preparation of demonstrative evidence, scene documentation for presentation, and testimony.

FSE 498. Independent Study. (1-3 Credits)
A. Prerequisite: Departmental approval. Individual reading and research on a problem or area within the field of Fire and Safety, after student consultation with the instructor. Student must have the independent study proposal form approved by faculty supervisor and department chair prior to enrollment. May be retaken to a maximum of six hours providing the project title differs.

FSE 499. Practicum. (1-12 Credits)
A. Prerequisite: departmental approval. Supervised field observation, research, and/or experience.