ENFP  Engineering, Fire Protection  Fall 2016

ENFP101  Hot Topics in Fire Protection Engineering
(Perm req)

Credits: 1  Grading Method: Regular,
Pass-Fail, Audit

Restriction: Permission of ENGR-Fire Protection Engineering department. Credit only granted for:
ENFP 108 or ENFP 101. Formerly: ENFP108.

Current issues of importance to fire protection engineering. Topics focus on advances in basic fire
science, computerized fire modeling, safety systems, human behavior and fire, fire toxicity, risk
analysis, performance based fire safety, fire reconstruction, arson and evidence, voluntary fire safety
standards, codes, and relations with other disciplines including architecture and the built environment,
loss prevention and fire insurance.

<table>
<thead>
<tr>
<th>0101</th>
<th>James Milke</th>
<th>Seats (Total: 25, Open: 25, Waitlist: 0)</th>
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<tr>
<td></td>
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<td>M 12:00pm - 12:50pm</td>
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ENFP250  Introduction to Life Safety Analysis
(Perm req)

Credits: 3  Grading Method: Regular,
Audit

Prerequisite: Permission of ENGR-Fire Protection Engineering department. Credit only granted for:
ENFP250 or ENFP251. Formerly: ENFP251.

Introduction to fire protection engineering and building regulation, building safety systems, and egress

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<tr>
<th>0101</th>
<th>Kenneth Isman</th>
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<td>TuTh 9:30am - 10:45am</td>
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ENFP310  Water Based Fire Protection Systems Design
(Perm req)

Credits: 3  Grading Method: Regular,
Pass-Fail, Audit

Prerequisite: ENFP300. Corequisite: ENFP312. Restriction: Permission of ENGR-Fire Protection
Engineering department.
Introduction to aqueous fire suppression. Discussion of key fluid dynamics and heat transfer processes in aqueous fire suppression. System design and performance analysis based on national standards, hydraulic theory and elementary fluid dynamics and heat transfer.

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<th>Instructor</th>
<th>Seats (Total: 40, Open: 40, Waitlist: 0)</th>
<th>Time</th>
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<tr>
<td>ENFP312</td>
<td>Heat and Mass Transfer</td>
<td>Kenneth Isman</td>
<td>EGR 0135</td>
<td>MWF 11:00am - 11:50am</td>
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ENFP312 Heat and Mass Transfer

Credits: 3
Grading Method: Regular,
Pass-Fail, Audit

Prerequisite: ENES232 and ENFP300. Restriction: Permission of ENGR-Fire Protection Engineering department.


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<tr>
<td>ENFP405</td>
<td>Structural Fire Protection</td>
<td>Marino diMarzo</td>
<td>EGR 1202</td>
<td>MW 9:00am - 9:50am, M 1:00pm - 2:50pm</td>
<td>JMP 1109 Lab</td>
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ENFP405 Structural Fire Protection

Credits: 3
Grading Method: Regular,
Pass-Fail, Audit

Prerequisite: ENES220. Restriction: Must be in Engineering: Fire Protection program; and permission of ENGR-Fire Protection Engineering department.

Effects of elevated temperature on structural materials; steel, concrete, wood, gypsum, glass and reinforced plastics. Experimental evaluation of fire resistance of building assemblies. Analytical methods to evaluate fire resistance of structural members.

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<th>Seats (Total: 30, Open: 30, Waitlist: 0)</th>
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<th>Location</th>
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<td>ENFP413</td>
<td>Advanced Life Safety Analysis</td>
<td>James Milke</td>
<td>EGR 1104</td>
<td>Th 3:30pm - 4:50pm, Tu 3:30pm - 4:50pm</td>
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ENFP413 Advanced Life Safety Analysis

Credits: 3
Grading Method: Regular,
Pass-Fail, Audit

Prerequisite: ENFP250. Restriction: Permission of ENGR-Fire Protection Engineering department.
Also offered as: ENFP613. Credit only granted for: ENFP413 or ENFP613.

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<td>ENFP415</td>
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**ENFP415 Fire Dynamics**

Grading Method: Regular, Pass-Fail, Audit

Prerequisite: ENFP312.  Restriction: Permission of ENGR-Fire Protection Engineering department.

Also offered as: ENFP651.  Credit only granted for: ENFP415 or ENFP651.

Introduction to premixed and diffusion flames; ignition, flame spread and rate of burning; fire plumes; flame radiation.

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<tr>
<td>ENFP415</td>
<td>Stanislav Stoliarov</td>
<td>PLS 1130</td>
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**ENFP425 Enclosure Fire Modeling**

Grading Method: Regular, Pass-Fail, Audit

Prerequisite: ENES232, ENFP300, and ENFP312.  Restriction: Must be in Engineering: Fire Protection program; and senior standing; and permission of ENGR-Fire Protection Engineering department.

An introduction to enclosure fire dynamics through the development of fire modeling algorithms and the application of computer-based fire modeling techniques. The objectives of the course are: to provide a basic understanding of enclosure fire dynamics with an emphasis on a system-level viewpoint (i.e., a global description of the coupling between combustion dynamics, smoke filling, vent flows and heat transfer); and to provide an introduction to the zone modeling approach.  Topics covered include a review of the mathematical formulation of zone models, a discussion of numerical integration of the zone modeling equations (using MATLAB), and an introduction to zone modeling software used by professional engineers (e.g., CFAST).

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**ENFP429 Independent Studies**
For students who have definite plans for individual study of approved problems, or study of an advanced topic selected in conjunction with the faculty.

Senior standing. For ENFP majors only.

**Contact department for information to register for this course.**

### ENFP489 Special Topics

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<th>Credits: 3</th>
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Selected topics of current importance to fire protection.

For ENFP majors only.

**Contact department for information to register for this course.**

### ENFP489I Special Topics; Industrial Fire Safety

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<th>Credits: 3</th>
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Selected topics of current importance to fire protection.

Prerequisite: permission of department.

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<tr>
<td>0101</td>
<td>Noah Ryder, Arnaud Trouve</td>
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### ENFP613 Human Response to Fire

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<th>Credits: 3</th>
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Prerequisite: Permission of ENGR-Fire Protection Engineering department. Also offered as: ENFP413.


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<tr>
<td>0101</td>
<td>Kenneth Isman</td>
<td>EGR 0135</td>
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<td>TuTh 2:00pm - 3:15pm</td>
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ENFP619  Graduate Seminar
(Perm req)  Grading Method: Regular, Audit
Credits: 1-3

0101  Arnaud Trouve  Seats (Total: 5, Open: 5, Waitlist: 0)
Contact instructor or department for details.

ENFP620  Fire Dynamics Laboratory
Credits: 3  Grading Method: Regular, Audit

Recommended: ENFP415.

Laboratory experiments are designed to illustrate fire phenomena and test theoretical models. Diffusion flames, ignition and flame spread on solids, liquid pool fires, wood crib fires, fire plumes, compartment fires.

0101  Andre Marshall  Seats (Total: 15, Open: 15, Waitlist: 0)
W 12:30pm - 3:00pm  EGR 3111

ENFP621  Analytical Procedures of Structural Fire Protection
(Perm req)  Grading Method: Regular, Audit
Credits: 3

Prerequisite: ENFP405 and ENFP312.

Analysis procedures for structural components of wood, steel, concrete, composites. Structural capabilities, modifications under fire induced exposures. Calculations, computer models for predicting fire resistance ratings of structural components.

0101  James Milke  Seats (Total: 10, Open: 10, Waitlist: 0)
Th 3:30pm - 4:50pm  EGR 1104
Tu 3:30pm - 4:50pm  EGR 1104

ENFP626  Computational Fire Modeling
Credits: 3  Grading Method: Regular, Audit

Prerequisite: Permission of ENGR-Fire Protection Engineering department; and ENFP300; and ENFP312.
Introduction to Computational Fluid Dynamics (CFD)-based fire modeling; governing equations of turbulent reacting flows; numerical approaches to the treatment of turbulence (DNS, LES, RANS); numerical methods for partial differential equations; physical modeling of enclosure fires (turbulence, combustion, thermal radiation, pyrolysis, suppression). Development of sample programs (Matlab) and use of current CFD-based fire models (FDS).

ENFP627
Smoke Detection and Management
Credits: 3
Grading Method: Regular
Prerequisite: ENFP300. Also offered as: ENFP440. Credit only granted for: ENFP627 or ENFP440.

Analysis of hazard smoke. Response analysis of smoke detectors based on characteristics of detectors and properties of smoke. Performance characteristics and limitations of smoke management systems. Capabilities and limitations of analytical design aids.

ENFP629
Selected Topics
Credits: 3-6
Grading Method: Regular, Audit

Current research, studies in fire protection engineering. Future trends and significant changes in research, professional areas. The professional standards process.

Contact department for information to register for this course.

ENFP629I
Selected Topics; Industrial Fire Safety
Credits: 3
Grading Method: Regular, Audit

Current research, studies in fire protection engineering. Future trends and significant changes in research, professional areas. The professional standards process.

Prerequisite: permission of department.
## ENFP630  Diffusion Flames and Burning Rate Theory

Credits: 3  
Grading Method: Regular, Audit

*Basic principles of diffusion flames for gaseous, liquid, and solid fuels. Droplet burning, B number, jet combustion, boundary layer combustion, generalized methods.*

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<th>Section</th>
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<td>0101</td>
<td>Peter Sunderland</td>
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## ENFP649  Special Problems

(Perm req)  
Credits: 1-3  
Grading Method: Regular, Audit

*Advanced topics selected by the faculty from the current literature to suit the special needs and background of students, or for individual students who have definite plans of individual study.*

Prerequisite: permission of department.

**Contact department for information to register for this course.**

## ENFP651  Advanced Fire Dynamics

(Perm req)  
Credits: 3  
Grading Method: Regular, Audit

*Credit only granted for: ENFP629A or ENFP651. Formerly: ENFP629A.*

*A review of the basic chemistry and physics necessary to understanding fire dynamics; and of the physics of heat transfer and turbulent fluid flow will be given. The nature and structure of premixed and diffusion flames will be presented.*

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<td>0101</td>
<td>Stanislav Stoliarov</td>
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## ENFP663  Advanced Fire Risk Modeling

(Perm req)  
Credits: 3  
Grading Method: Regular, Audit

*Credit only granted for: ENFP629R or ENFP663. Formerly: ENFP629R.*

*This on-line course addresses the fundamentals of fire risk modeling from both theoretical and applied perspectives.*
ENFP799  Master's Thesis Research
(Perm req)

Credits: 1-6  Grading Method: Regular, Sat-Fail

Development and completion of Master's Thesis.

Contact department for information to register for this course.