Course Code and Title: ENFP420, *Fire Assessment Methods and Laboratory*

Credits: 4

Contact hours: Two classroom meetings weekly (75 minutes each) and one laboratory meeting weekly (75 minutes)

Instructor, term: Peter Sunderland, Spring 2026

Textbook: Readings provided on ELMS.

Catalog description: *Experimental evaluation of ignition, flame spread, rate of heat release and smoke production of flammable gases, liquids, solids, and interior finish materials. Analytical and computer methods for the design, performance, and analysis of fire experiments. Preparation of laboratory reports.*

Prerequisite: ENFP 415.

This course informs students about fire test measurements and standards. Students conduct and observe laboratory experiments on fire dynamics. Upon successful completion of the course, students will be able to:

- Design and conduct laboratory tests and measurement analyses;
- Prepare laboratory reports;
- Understand terminology and issues related to fire hazards and flammability assessment methods; and
- Understand the relationship between fire protection design issues and fire dynamics/performance.

ABET student outcomes assessed: ENFP 420 teaches and assesses the following ABET student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

The brief list of topics covered is as follows.

- Lab 1: Cleveland Open Cup – ASTM D92
- Lab 2: Smoke Chamber – ASTM E662
- Lab 3: Cone Calorimeter – ASTM E1354
- Lab 4: Cup Burner – NFPA2001 Annex B
- Lab 5: Downward Spread – ASTM E162
- Candle experimentation
- Fire Protection Design Issues
- Fire Test Instrumentation
- Fire Physics
- Fire Safety Regulation

- Ignition
- Smoke Production
- Fire Growth
- Fire Spread