ENFP410 Advanced Fire Suppression

Credits: Three credits, two 75 minute lectures weekly

Instructor: Kenneth E. Isman, P.E.

Textbooks:

- NFPA 10 – 2013
- NFPA 11 – 2016
- NFPA 12 – 2015
- NFPA 12A – 2015
- NFPA 13 – 2016
- NFPA 14 – 2016
- NFPA 16 – 2015
- NFPA 17 – 2013
- NFPA 17A – 2013
- NFPA 30 – 2015
- NFPA 409 – 2016
- NFPA 750 – 2015
- NFPA 2001 – 2015
- All provided on-line to students for free

Specific course information:

1. This course analyzes the application and theory of fire suppression systems. The key elements of fire suppression systems will be discussed along with how they interact for effective fire suppression design. Physical mechanisms for a variety of fire suppression approaches will be discussed including (hose streams, sprinklers, water mist, foam, clean agents, and chemical agents).
2. Prerequisites: Heat and Mass Transfer (ENFP 312) and Water Based Fire Protection Systems (ENFP 310)
3. Required Course

Specific goals for the course:

1. Upon completion of this course, students should be able to:
   - Determine discharge criteria and installation requirements for a wide variety of fire suppression systems designed to protect special hazards.
   - Use computer design software to design and analyze fire suppression systems.

2. This courses focuses on two SOs:
   - SO3 - An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
   - SO8 - The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
   - SO10 - A knowledge of contemporary issues.

Brief list of topics:

- Foam Systems
- Halon and Clean Agent Systems
- Water Mist Systems
- Carbon Dioxide Systems
- Dry-Wet Chemical Systems
- Preaction Sprinkler Systems
- Sprinkler Systems for Storage Occupancies
- Standpipe Systems
- Darcy-Weisbach Friction Loss
- Hardy Cross Loop Analysis
- Velocity Pressure Calculations