

ENFP310 Water Based Fire Protection Systems Design

Credits: Three (3)

Contact hours: Two lectures per week, 50 minutes each and one discussion period per week, 110 minutes long.

Table 5-1 category: Engineering topic with significant design component

Instructor: Isman

Textbooks: *Layout, Detail and Calculation of Fire Sprinkler Systems, 3rd Edition*, Published by the National Fire Sprinkler Association, 2022.

Pumps for Fire Protection Systems by Kenneth E. Isman and Milosh T. Puchovsky, Published by the National Fire Protection Association, 2002 (electronic edition provided to students for free)

Other supplemental materials:

NFPA 13 – 2016 Edition (on-line version provided to students for free)

Catalog description:

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.

Prerequisites and Corequisites:

Prerequisite: ENFP300. Corequisite: ENFP312. Restriction: Permission of ENGR-Fire Protection Engineering department.

Table 5-1 Course Type: Required

Specific outcomes of instruction:

Upon completion of this course, students should be able to:

- Identify sprinkler design criteria in accordance with nationally recognized standards
- Specify the types, locations and positions of sprinklers in a building
- Perform hydraulic calculations to determine the demand of a sprinkler system
- Evaluate whether a given water supply is adequate for a system
- Use fire pumps as a solution to insufficient pressure from a water supply
- Test fire pumps

Student outcomes assessed: SO2.2, SO2.3, SO6.3

Brief list of topics covered:

History of sprinklers; listing of products/How do sprinklers get listed?

Contracts, specifications and the role of the engineer

Wet, dry, preaction and deluge sprinkler systems; sprinkler spacing and location (including what spaces get sprinklers within a building); aboveground and underground pipe types and configurations; hangers and seismic design considerations

Hydraulic calculations; fire pumps; standpipe systems; tanks for fire protection