

ENFP300 Fire Protection Fluid Mechanics

Credits: Three (3)

Contact hours: Two lectures per week, 75 minutes each. One discussion per week, 50 minutes.

Table 5-1 category: Engineering topic

Instructor: Raffan-Montoya

Textbook: Munson, Young and Okiishi's Fundamentals of Fluid Mechanics (9th Edition) by Gherart et al. Wiley.

Other supplemental materials: None

Catalog description:

Presents students with the fundamental properties of fluids and fluid movement. Both static and dynamic fluid problems will be considered with an emphasis on fire protection systems.

Prerequisites and Corequisites:

Prerequisites: MATH246 and ENFP201. Must have completed or be concurrently enrolled in PHYS260, PHYS261. Restriction: Permission of ENGR-Fire Protection Engineering department.

Credit only granted for: BIOE331, ENCE305, ENFP300, or ENME331.

Table 5-1 Course Type: Required

Specific outcomes of instruction:

- Demonstrate a working knowledge of statics and dynamics of fluid flow
- Apply the Bernoulli principle to the solution of fluid flow problems and understand the limitations of said principle
- Estimate pressure drop in pipes and ducts accounting for viscous losses
- Evaluate a hydraulic network with application to sprinkler design

Student outcomes assessed: SO1

Brief list of topics covered:

Statics and dynamics of fluid flow. Pressure and Buoyancy

Bernoulli equation

Kinematics and flow field descriptions

Conservation statements with control volume analysis

Conservation statements with differential analysis. Navier-stokes equations.

Boundary layers and viscous flow in pipes and ducts

Hydraulic networks

Energy considerations in systems with pumps

