

FIRE 232 : FIRE PROTECTION HYDRAULICS AND WATER SUPPLY

Transcript title

Fire Protection Hyd. Supply

Credits

4

Grading mode

Standard letter grades

Total contact hours

60

Lecture hours

30

Lab hours

30

Prerequisites

FIRE 104, FIRE 105, FIRE 120, FIRE 175, FIRE 205, and MTH 098 (or higher) or minimum placement Math Level 14.

Course Description

Provides a foundation of theoretical knowledge in the principles of the use of water in fire protection and in the application of hydraulic principles to analyze and solve water supply problems. FESHE non-core requirement equivalent to NFA C0277 and DPSST certification in NFPA Pumper Operator.

Course learning outcomes

1. Apply mathematics and physics to the movement of water in fire suppression activities.
2. Describe the design principles of fire service pumping apparatus.
3. Analyze community fire flow demand criteria.
4. Demonstrate, through problem solving, a thorough understanding of the principles of forces that affect water at rest and in motion.
5. Operate as an engineer at a mock scene of a fire or other emergency in a safe and effective manner.

Content outline

The learning outcomes are those of the National Fire Academy (NFA).

1. Water as an extinguishing agent: physical properties, terms and definitions
2. Math review: fractions ratios, proportions, and percentages, powers and roots
3. Water at rest: basic principles of hydrostatics, pressure and force, six principles of fluid pressure, pressure as a function of height and density, atmospheric pressure, measuring devices for static pressure

4. Water in motion: basic principles of hydrokinetics, measuring devices for measuring flow, relationship of discharge velocity, orifice size, and flow
5. Water distribution systems: water sources, public water distribution systems, private water, distribution systems, friction loss in piping systems, fire hydrants and flow testing
6. Fire pumps: pump theory, pump classifications, priming systems, pump capacity, pump gauges and control devices, testing fire pumps
7. Fire streams: calculating fire flow requirements, effective horizontal and vertical reach appliances for nozzles, performance of smooth-bore and combination nozzles, hand-held lines, master streams, nozzle pressures and reaction, water hammer and cavitations
8. Friction loss: factors affecting friction loss, maximum efficient flow in fire hose, calculating friction loss in fire hose, friction loss in appliances, reducing friction loss
9. Engine pressures: factors affecting engine pressure
10. Standpipe and sprinkler systems: classifications, components, supplying systems

Required materials

This course requires students to purchase a textbook.