

COURSE OUTLINE
Water Supply and Hydraulics

SECTION I

SUBJECT AREA AND COURSE NUMBER: Fire Technology – FTA 210

COURSE TITLE: Water Supply and Hydraulics

COURSE CATALOG DESCRIPTION: This course will cover basic static and dynamic fluid principles and properties. Factors of friction loss will be presented in detail. Municipal water supply schemes and alternate water delivery systems will be discussed as well as fire-fighting pump mechanics and water supply apparatus systems. Students will be introduced to skills needed for developing fire scene hydraulics estimates.

LECTURE HOURS PER WEEK: 3 **CREDIT HOURS:** 3

LAB HOURS PER WEEK: 0

PREREQUISITES: FTA 112, MAT 137, and PHY 121 or permission of instructor

SECTION II

- A. SCOPE:** Students will study basic static and dynamic fluid principles and properties and will use various mathematical equation derivations to calculate fluid flow and pressure from orifices, friction loss estimates, and fire hydrant flow potential. Students will study skills required to develop fire scene hydraulics estimates.
- B. REQUIRED WORK:** Students will be expected to complete all assigned readings and homework and submit all written work on time.
- C. ATTENDANCE AND PARTICIPATION:** Regular attendance and class participation are expected.
- D. METHODS OF INSTRUCTION:** The methods of instruction are determined by each instructor and may include but are not limited to lecture/discussion, small group tasks, collaborative learning, experimental/exploration, distance learning, student presentations, or use of technologies such as audio/visual materials, computers, and internet.

E. OBJECTIVES, OUTCOMES, AND ASSESSMENT: The following objectives and outcomes represent the department's core requirement for student achievement:

LEARNING OBJECTIVES	LEARNING OUTCOMES	ASSESSMENT METHODS
To demonstrate an understanding of:	Student will:	As measured by:
1. The student's role in the learning process	a) Attend regularly, on time, and stay for entire class period; b) Complete assignments and contribute positively to the class	Attendance records Class records
2. The principles of hydraulics	Understand principles of forces that affect fluids at rest and in motion	Problem solving
3. The application of mathematics and physics to the movement of water in fire suppression	Develop solutions for fluid discharge from orifices; Develop solutions for friction loss; Calculate pump pressure for complex hose layouts	Problem solving and exams
4. Water distribution systems	Detail components of a water distribution system	Exam
5. The theory of fire pumps	Describe operations of centrifugal pumps and positive displacement pumps	Exam
6. The dynamics of supplying firefighting water	Calculate effects of hose diameters and elevation changes	Exam

F. **TEXTS AND MATERIALS:** As selected by instructor.

G. **INFORMATION TECHNOLOGY:** As determined by instructor.