COURSE OUTLINE

Course Number	Course Title	Credits
FIR 202	**Water Supply**	**3**
Hours: 3 Lecture **Lecture/Lab/Other**	**Co- or Pre-requisite**	**Implementation** **Semester & Year**

Catalog description:
Explores water supply storage and distribution as well as efficient use of water at fire scenes.

General Education Category:
Not GenEd
Choose an item.

Course coordinator:
James McCann, mccannj@mccc.edu or (609) 799-3245

Required texts & Other materials:
Fire Service Hydraulics and Water Supply, 3rd edition, IFSTA, Fire Service Publication

Course Student Learning Outcomes (SLO):

Upon successful completion of this course the student will be able to:

1. Apply the application of mathematics and physics to the movement of water in fire suppression activities. (ILG 2, 3), (PLO 3)
2. Understand the principles of the use of water in fire protection and to apply hydraulic principles. (ILG 1, 2, 3), (PLO 1, 2 ,3)
3. Apply hydraulic principles to analyze and to solve water supply problems. (ILG 2,3,11), (PLO 2, 3)
4. Understand basic fire suppression equipment used to flow water for fire streams, standpipes and sprinkler systems. (ILG 3, 4,11), (PLO 3, 4, 5, 6)
5. Comprehend the design principles of fire service pumping apparatus and their basic operations. (ILG 2, 3, 4, 11), (PLO 1, 3, 4, 5, 6)
6. Understand the principles of friction loss and engine/pump pressures and the calculations used for water flow. (ILG 2, 3, 4, 11), (PLO 3)
7. Analyze community fire flow demand criteria. (ILG 2, 3, 4, 10, 11), (PLO 3, 4, 5, 6, 7)
8. Demonstrate, through problem solving, a thorough understanding of the principles of forces that affect water at rest and in motion. (ILG 2, 3, 4, 10, 11), (PLO 3)

Course-specific Institutional Learning Goals (ILG):

Institutional Learning Goal 1.
Written and Oral Communication in English: Students will communicate effectively in both speech and writing.

Institutional Learning Goal 2.
Mathematics: Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

Institutional Learning Goal 3.
Science: Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

Institutional Learning Goal 4.
Technology: Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

Institutional Learning Goal 10: Information Literacy: Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

Institutional Learning Goal 11: Critical Thinking: Students will use critical thinking skills understand, analyze, or apply information or solve problems.

Program Learning Outcomes for (PLO)

1. Discuss the history, support organizations, resources, incident management, training, and emergency operations and relate how each plays a role within the fire service.
2. Define and use basic terms and concepts associated with the chemistry and dynamics of fire;
3. Apply principles of hydraulics, building construction, strategy, and tactics to fire ground operations;
4. Communicate the relationship of fire prevention and fire inspection;
5. Demonstrate the importance of public education in relation to fire prevention;
6. Evaluate facilities to appraise code compliance and potential hazards, building construction issues, and presence of appropriate fire protection systems to help ensure life safety both pre-incident and during an incident;
7. Employ safe work practices using recognized standards and regulations.

Units of study in detail – Unit Student Learning Outcomes:
Learning Objectives
The student will be able to:

I. Water as an extinguishing agent (Supports SLO 1, 2, 3, 4)

A. Understand Physical properties
B. Explain Terms and definitions

II. Math review (Supports SLO 1)

A. Understand Fractions
B. Understand Ratios, proportions, and percentage
C. Understand Powers and roots

I. **III. Water at rest (Supports SLO 2, 3, 8)**

A. Undertstand and explain Basic principles of hydrostatics
   1. Pressure and force
   2. Six principles of fluid pressure
   3. Pressure as a function of height and density
   4. Atmospheric pressure
B. Understand and explain Measuring devices for static pressure

IV. Water in motion (Supports SLO 4, 5, 6)

A. Understand the Basic principles of hydrokinetics
B. Describe the Measuring devices for measuring flow
C. Explain the Relationship of discharge velocity, orifice size, and flow

V. Water distribution systems (Supports SLO 3, 4, 5, 6, 7, 8)

A. Describe the Water sources
B. Understand Public water distribution systems
C. Understand Private water distribution systems
D. Understand Friction loss in piping systems
E. Explain the reason for Fire hydrants and flow testing

VI. Fire Pumps (Supports SLO 2, 3, 4, 5, 6)

A. Understand and Explain Pump theory
B. List the types of Pump classifications
C. Describe Priming systems
D. Understand and describe Pump capacity
E. Understand and describe Pump gauges and control devices
F. Explain the Testing fire pumps

VII. Fire streams (Supports SLO 4, 5, 6)

A. Understand Calculating fire flow requirements
B. Differentiate between Effective horizontal and vertical reach
C. Describe and list Appliances for nozzles
D. Differentiate between Performance of smooth-bore and combination nozzles
E. Describe Hand-held lines
F. Describe Master streams
G. Understand and explain Nozzle pressures and reaction
H. Understand and explain Water hammer and cavitations

VIII. Friction loss (Supports SLO 1, 2, 3, 4, 5, 6, 8)

A. Describe Factors affecting friction loss
B. Understand Maximum efficient flow in fire hose
C. Explain Calculating friction loss in fire hose
D. Understand and Describe Friction loss in appliances
E. Describe how to Reduce friction loss

IX. Engine pressures (Supports SLO 1, 2, 3, 4, 5, 6, 8)

A. Understand and explain Factors affecting engine pressure

X. Standpipe and sprinkler systems (Supports SLO 2, 4, 5, 6, 8)

A. Standpipe systems
    1. List the Classifications
    2. Describe the Components
    3. Explain Supplying Standpipe Systems
B. Sprinkler systems
    1. List the Classifications
    2. Describe the Components
    3. Explain Supplying sprinkler systems

Evaluation of student learning: Students will be evaluated for mastery of learning objectives by methods of evaluation to be determined by the instructor. Periodic tests or quizzes as well as a final exam may be utilized. Other methods such as a research papers or group projects are encouraged.