



COURSE OUTLINE FALL 2008

FIR 202
Course Number

3
Credits

Water Supply for Fire Protection
Course Title

3 Lecture Hours
Hours: lecture/laboratory/other (specify)

Catalog description:

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

Prerequisites: None

Corequisites: None

Is course New or Modified? No

Required texts/other materials:

Fire Service Hydraulics and Water Supply, IFSTA, Fire Service Publications

Last revised: n/a

Course coordinator: Scott Loh, 799-3245 (Dempster Center), lohs@mccc.edu

Information resources:

U.S. Fire Administration

Publications: http://www.usfa.fema.gov/applications/publications/pubs_main.cfm

See Fire Protection, Fire Administration, Fire Service Operations, Wildfire

Applied Research:

<http://www.usfa.fema.gov/dhtml/inside-usfa/research.cfm>

Research Reports:

http://www.usfa.fema.gov/dhtml/inside-usfa/r_reports.cfm

Technical Reports: <http://www.usfa.fema.gov/applications/publications/techreps.cfm>

Topical Fire Research Series:

<http://www.usfa.fema.gov/dhtml/inside-usfa/tfrs.cfm>

Learning Resource Center:

<http://www.usfa.fema.gov/dhtml/inside-usfa/lrc.cfm>

National Institute for Standards and Technology

<http://www.fire.nist.gov>: Fire Tests/Data, Software/Models, Publications, FIREDOC (under Publications)

References

Introduction to Fire Pumps; Thomas Sturtevant, Thomson, 2004

Hydraulics for Firefighting; William Crapo, Thomson, 2001

Techniques of Fire Hydraulics; Lawrence Erven, Glencoe Fire Service Series, 1972

Fire Service Hydraulics; James Casey, Pennwell, 2nd.Ed. 1984

Pumping Apparatus: Driver/Operator Handbook; Fire Protection Publications, 1998

Fire Service Pump Operators Handbook; Warren Isman, Pennwell 1984

Fire Protection Hydraulics and Water Supply Analysis; Pat Brock, Fire Protection Publications, 2005

Fire Protection Handbook, NFPA

Other learning resources:

Current Events/News

<http://www.firehouse.com/>

<http://www.fireengineering.com/>

<http://www.withthecommand.com/>

Course goals:

This course provides a foundation of theoretical knowledge in order to understand the principles of the use of water in fire protection and to apply hydraulic principles to analyze and to solve water supply problems.

The student will be able to:

- Apply the application of mathematics and physics to the movement of water in fire suppression activities.
- Comprehend the design principles of fire service pumping apparatus.
- Analyze community fire flow demand criteria.
- Demonstrate, through problem solving, a thorough understanding of the principles of forces that affect water at rest and in motion.

Course-specific General Education Core Competencies and Goals.

General Education Knowledge Goals

Mathematics. Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

Science. Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

MCCC Core Skills

Critical Thinking and Problem-solving. Students will use critical thinking and problem solving skills in analyzing information.

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 and continuing into the fire protection industry.

Collaboration and cooperation. Students will develop the interpersonal skills required for effective performance in group situations through required course work.

Units of study in detail.

- I. Water as an extinguishing agent
 - A. Physical properties
 - B. Terms and definitions

- II. Math review
 - A. Fractions
 - B. Ratios, proportions, and percentage
 - C. Powers and roots

- III. Water at rest
 - A. 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. Measuring devices for static pressure

- IV. Water in motion
 - A. Basic principles of hydrokinetics
 - B. Measuring devices for measuring flow
 - C. Relationship of discharge velocity, orifice size, and flow

- V. Water distribution systems
 - A. Water sources
 - B. Public water distribution systems
 - C. Private water distribution systems
 - D. Friction loss in piping systems
 - E. Fire hydrants and flow testing

- VI. Fire Pumps
 - A. Pump theory
 - B. Pump classifications
 - C. Priming systems
 - D. Pump capacity
 - E. Pump gauges and control devices
 - F. Testing fire pumps

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

- VIII. Friction loss
 - A. Factors affecting friction loss
 - B. Maximum efficient flow in fire hose
 - C. Calculating friction loss in fire hose
 - D. Friction loss in appliances
 - E. Reducing friction loss

- IX. Engine pressures
 - A. Factors affecting engine pressure

- X. Standpipe and sprinkler systems
 - A. Standpipe systems
 - 1. Classifications
 - 2. Components
 - 3. Supplying Standpipe Systems
 - B. Sprinkler systems
 - 1. Classifications
 - 2. Components
 - 3. 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 or group projects are encouraged.

Academic Integrity Statement: Mercer County Community College and the Fire Science program are committed to Academic Integrity -- the honest, fair and continuing pursuit of knowledge, free from fraud or deception. This implies that students are expected to be responsible for their own work and that faculty and academic support services staff members will take reasonable precautions to prevent the opportunity for academic dishonesty. The Fire Science program affirms its support of the Academic Integrity Policy as printed in the Student handbook and approved by the College Board of Trustees March 18, 2004.