

COURSE SYLLABUS

LAST REVIEW	Spring 2021
COURSE TITLE	Fire Hydraulics
COURSE NUMBER	FRSC 0202
DIVISION	Health Professions
DEPARTMENT	Fire Science
CIP CODE	43.0203
CREDIT HOURS	3
CONTACT HOURS/WEEK	Class: 3
PREREQUISITES	None
COURSE PLACEMENT	Students must meet the correct placement measure for this course. Information may be found at: https://www.kckcc.edu/admissions/information/mandatory-evaluation-placement.html

COURSE DESCRIPTION

Students examine fluid flow, measurement and water availability from distribution systems is included in this course. Maintenance and inspection procedures for various water protection systems are also studied.

PROGRAM LEARNING OUTCOMES

1. Demonstrate physical skills needed for employment as a firefighter.
2. Explain fire behavior.
3. Apply emergency management skills to provide basic emergency medicine in the field.
4. Evaluate strategy and tactics related to fire safety, survival techniques, and fire management.
5. Explain legal issues related to fire services administration.
6. Demonstrate employability skills necessary for completing the job search process.

TEXTBOOKS

<http://kckccbookstore.com/>

METHODS OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels,

conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. Basic Formulas
 - A. Review of basic math/algebra
 - B. Properties of water
 - C. Measurements

- II. Pressure in fluids
 - A. Force of water
 - B. Pressure of water
 - C. Water flow

- III. Velocity
 - A. Falling objects
 - B. Water in pipes
 - C. Velocity in terms of pressure

- IV. Flow
 - A. Discharge
 - B. Energy in flow
 - C. Nozzles

- V. Friction Loss
 - A. Engine-pressure
 - B. Friction loss equation
 1. 2-1/2" hose
 2. 1-1/2" hose
 3. Small diameter hose
 4. Large hose

- VI. Engine-Pressure-Nozzle-Pressure
 - A. Engine pressure
 - B. Nozzle pressure
 - C. EP-NP formulas
 - D. Relaying

- VII. Fog Nozzles

- VIII. Range of Streams

- IX. Field Equations

- X. Pumps

- A. Types of pumps
 - B. Positive displacement pumps
 - C. Centrifugal pumps
 - D. Drafting water
- XI. Reactions
- A. Hose reactions
 - B. Water hammer
 - C. Pipe friction loss
 - D. Sprinkler head flow
 - E. Fire hydrant testing

COURSE LEARNING OUTCOMES

Upon successful completion of this course, the student will:

- A. Calculate basic water flow formulas.
- B. Understand fluid pressures.
- C. Understand water velocity.
- D. Understand water flow.
- E. Explain friction loss.
- F. Differentiate between engine pressure and nozzle pressure.
- G. Understand fog nozzles.
- H. Identify the range of various water streams.
- I. Figure hydraulic equations in the field.
- J. Understand fire pumps and pump operations.
- K. Describe how water reacts under different situations.

ASSESSMENT OF COURSE LEARNING OUTCOMES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.

