DATE OF LAST REVIEW : 02/2013
CIP CODE: 43.0205, 43.0202, 43.0203
SEMESTER: Departmental Syllabus
COURSE NAME: Fire Hydraulics
COURSE NUMBER: FRSC-0202
CREDIT HOURS: Three (3)
INSTRUCTOR: Departmental Syllabus
OFFICE LOCATION: Departmental Syllabus
OFFICE HOURS: Departmental Syllabus
TELEPHONE: Departmental Syllabus
EMAIL: Departmental Syllabus

KCKCC issued email accounts are the official means for electronically communicating with our students.

PREREQUISITE(S): None

REQUIRED TEXT & MATERIALS: Please check with the KCKCC bookstore, http://www.kckccbookstore.com/, for the required texts for your particular class.

DESCRIPTION OF COURSE:
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.

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

COURSE OUTLINE:
The course outline is indicated below and is subject to change as course development dictates.

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

EXPECTED LEARNER OUTCOMES:
A. The student will be able to calculate basic water flow formulas.
B. The student will be able to understand fluid pressures.
C. The student will be able to understand water velocity.
D. The student will be able to understand water flow.
E. The student will be able to explain friction loss.
F. The student will be able to differentiate between engine pressure and nozzle pressure.
G. The student will be able to understand fog nozzles.
H. The student will be able to identify the range of various water streams.
I. The student will be able to figure hydraulic equations in the field.
J. The student will be able to understand fire pumps and pump operations.
K. The student will be able to describe how water reacts under different situations.

**COURSE COMPETENCIES:**

*The student will be able to calculate basic water flow formulas.*
1. The student will be able to demonstrate how to calculate basic math formulas.
2. The student will be able to demonstrate how to calculate algebraic formulas.
3. The student will be able to understand the basic properties of water.
4. The student will be able to understand measurements and conversions.

*The student will be able to understand fluid pressures.*
5. The student will be able to explain water force and pressure.
6. The student will be able to demonstrate water flow from a hydrant.
7. The student will be able to demonstrate water flow from a fire pump.

*The student will be able to understand water velocity.*
8. The student will be able to understand basic concepts of velocity.
9. The student will be able to describe water flow in terms of velocity.
10. The student will be able to demonstrate how to use a petot gauge.

*The student will be able to understand water flow.*
11. The student will be able to explain discharge of water.
12. The student will be able to explain energy in the flow of water.
13. The student will be able to explain how nozzles affect the velocity and pressure of water.

*The student will be able to explain friction loss.*
14. The student will be able to demonstrate how to calculate the area of an irregular shape.
15. The student will be able to demonstrate how to calculate friction loss in LDH.
16. The student will be able to demonstrate how to calculate nozzle pressure in LDH.
17. The student will be able to calculate friction loss in appliances.
18. The student will be able to explain friction loss in various size hose lines.
19. The student will be able to demonstrate how to calculate Bernoulli’s Equation.
20. The student will be able to demonstrate how to calculate elevation head.

*The student will be able to differentiate between engine pressure and nozzle pressure.*
21. The student will be able to calculate engine pressure.
22. The student will be able to calculate how to relay water on a slope.

*The student will be able to understand fog nozzles.*
23. The student will be able to calculate water flow employing fog nozzles.
24. The student will be able to demonstrate how to calculate nozzle reaction.

*The student will be able to identify the range of various water streams.*
25. The student will be able to demonstrate how to calculate intake loss and lift.
26. The student will be able to calculate the range of a water streams from a standpipe.
27. The student will be able to demonstrate how to calculate water streams from a deck gun.

_The student will be able to figure hydraulic equations in the field._

28. The student will be able to demonstrate how to hook to a hydrant and flow water.
29. The student will be able to demonstrate how to relay from one fire pump to another.

_The student will be able to understand fire pumps and pump operations._

30. The student will demonstrate how to calculate the discharge from a rotary gear pump.
31. The student will demonstrate how to calculate the discharge from a piston pump.
32. The student will be able to understand how to draft water from a tank or pond.

_The student will be able to describe how water reacts under different situations._

33. The student will demonstrate how to calculate sprinkler systems.
34. The student will demonstrate how to calculate BTU’s.
35. The student will be able to explain the concept of a water hammer.
36. The student will be able to explain sprinkler systems water flow.

**ASSESSMENT OF LEARNER OUTCOMES:**
Assessment methods may include, but are not limited to, the following: Homework, Assignments, Quizzes, Class Participation, Chapter Tests, and Final Exam. The grading scale and the process for calculating the course grades are to be determined by the individual instructors. This information will be included in each instructor’s syllabus.

**SPECIAL NOTES:**
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

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