

**CATALOG INFORMATION**

Dept and Nbr: FIRE 56

Title: FIRE HYDRAULICS

Full Title: Fire Hydraulics

Last Reviewed: 12/12/2011

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	17.5	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**  
A review of the math, calculations, principles and variables concerning the application of water as utilized in the fire service including an overview of the properties of water, the use of fire streams, formulas and mental calculations, types of pumps and water supplies, the regulations and standards associated with water delivery systems and the practical application of hydraulics in pumping exercises.

**Prerequisites/Corequisites:**  
Course Completion of FIRE 71; OR Course Completion of CSKLS 372 or Qualifying Placement from Math Assessment.  
See Student Success & Assessment Services ([assessment.santarosa.edu](http://assessment.santarosa.edu)) for more information about the assessment process.

**Recommended Preparation:**  
Eligibility for ENGL 100 or ESL 100

**Limits on Enrollment:**

**Schedule of Classes Information:**  
Description: A review of the math, calculations, principles and variables concerning the

application of water as utilized in the fire service including an overview of the properties of water, the use of fire streams, formulas and mental calculations, types of pumps and water supplies, the regulations and standards associated with water delivery systems and the practical application of hydraulics in pumping exercises. (Grade Only)

Prerequisites/Corequisites: Course Completion of FIRE 71; OR Course Completion of CSKLS 372 or Qualifying Placement from Math Assessment.

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Recommended: Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>	Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>IGETC:</b>	<b>Transfer Area</b>	Effective:	Inactive:
<b>CSU Transfer:</b>	Transferable	Effective: Fall 1981	Inactive: Fall 2018
<b>UC Transfer:</b>		Effective:	Inactive:

**CID:**

**Certificate/Major Applicable:**

Certificate Applicable Course

## **COURSE CONTENT**

### **Outcomes and Objectives:**

1. Demonstrate the ability to use mathematics and algebra to perform hydraulic equations.
2. Identify the different types of water supplies, distribution systems and their associated standards and regulations.
3. Describe the different types of pumps and the operation principles associated with each.
4. Identify the various types and sizes of hose streams and their uses.
5. Demonstrate the use of fire streams and their ranges.
6. Develop a variety of pumping situations which consider variables such as elevation, velocity, flow rates, friction loss, and nozzle pressure.

### **Topics and Scope:**

1. Applied Mathematics
  - a. Multiplication and division
  - b. Square root
  - c. Elementary algebra
2. Principles of Hydraulics
  - a. Hydraulic symbols
  - b. Velocity, rate of flow, and friction loss
  - c. Nozzle and engine pressures

- d. Other hydraulic formulas
3. Water Sources
  - a. Static water supplies
  - b. Dynamic water supplies
  - c. Fire code requirements
  - d. Insurance Services Office (ISO) grading system
4. Fire Pumps
  - a. Positive displacement pumps
  - b. Centrifugal pumps
  - c. Priming pumps
5. Fire Streams
  - a. Fog and spray
  - b. Straight streams
6. Pumping
  - a. Various hose layouts
  - b. Sprinklers and standpipes
  - c. Fire pump testing

### Assignment:

1. Reading of 10 - 40 pages per week
2. Homework problems such as end of chapter activities
3. Research paper 3-5 pages
4. Oral presentation on research paper
5. Oral presentation evaluations
6. 2 - 5 quizzes
7. Midterm exam
8. Final exam

### Methods of Evaluation/Basis of Grade:

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Research paper, written evaluations of oral presentations
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Writing 10 - 30%
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**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems
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Problem solving 10 - 20%
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**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None
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Skill Demonstrations 0 - 0%
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**Exams:** All forms of formal testing, other than skill performance exams.

Quizzes, midterm and final exam

Exams  
30 - 60%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Oral presentations

Other Category  
10 - 20%

**Representative Textbooks and Materials:**

Hydraulics for Firefighting, Crapo, William F. Cengage Learning, 2008