

FIRE 0074 - FIRE APPARATUS AND EQUIPMENT

Catalog Description

Advisory: Completion with grade of "C" or better or concurrent enrollment in FIRE 1

Hours: 54 lecture

Description: Principles and techniques for maintaining and operating fire service pumping and other mobile apparatus. Fire service equipment and apparatus troubleshooting; principles and techniques of preventive maintenance; construction and operation of fire service pumps and pump accessories; basic highway operating techniques for fire apparatus; fire apparatus specifications and testing procedures. (CSU-with unit limitation)

Course Student Learning Outcomes

- CSLO #1: Compare and contrast various types of fire service pumping apparatus.
- CSLO #2: Describe a preventive maintenance program for pumping apparatus.
- CSLO #3: Examine proper emergency vehicle operation and positioning at emergencies.
- CSLO #4: Determine the advantages and disadvantages of using water as a fire extinguishing agent.
- CSLO #5: Compare and contrast the efficiency and effectiveness of a fog nozzle versus a smooth bore nozzle.

Effective Term

Fall 2019

Course Type

Credit - Degree-applicable

Contact Hours

54

Outside of Class Hours

108

Total Student Learning Hours

162

Course Objectives

1. Assess the skills and physical abilities needed by the driver operator;
2. Compare and contrast various types of fire service pumping apparatus;
3. Examine the reasons for a routine inspection and maintenance program for fire apparatus;
4. Analyze a preventive maintenance program for pumping apparatus;
5. Evaluate troubleshooting procedures for fire service pumps;
6. Compare basic operations of emergency vehicles;
7. Examine proper emergency vehicle operation and positioning at emergencies;
8. Evaluate theoretical pressure calculations;

9. Calculate basic fire ground hydraulics using flow meters, calculators, charts and the hand method;
10. Investigate water supply sources available to the fire service;
11. Evaluate the effectiveness and efficiency of relay pumping operations versus water shuttle operations;
12. Compare firefighting foam equipment and systems and foam concentrate classifications;
13. Evaluate the advantages and disadvantages of using water as a fire extinguishing agent; and
14. Compare and contrast the efficiency and effectiveness of a fog nozzle versus a smooth bore nozzle.

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- CSU Transferable

Methods of Evaluation

- Essay Examinations
 - Example: In a short essay the student will explain the difference between a centrifugal pump and a positive displacement pump. Rubric Grading.
- Objective Examinations
 - Example: Students will take a multiple-choice examination on fire apparatus types. Standard Grading. Example question: An engine with a Class A pump, 1200 feet of hose and a water tank is considered: A. Class A, B. Class B, C. Class C, D. none of the above.
- Problem Solving Examinations
 - Example: After watching a scenario on apparatus inspections which has an inspector missing several key elements of the inspection, students are to identify what items were missed. Rubric Grading.

Repeatable

No

Methods of Instruction

- Lecture/Discussion
- Distance Learning

Lecture:

1. The instructor will lead a discussion on the use of the "hand method" of fire calculations and field hydraulics. The students will then work in small groups to solve field hydraulic problems.
2. The instructor will lecture on relay pumping operations and then the students will complete a worksheet showing various relay pumping diagrams and they will calculate proper pump pressures for each apparatus in the diagram.

Distance Learning

1. Following an online lecture on relay pumping, students, in a report will outline the effectiveness and efficiency of relay pumping operations

versus water shuttle operations and post their reports for other students to review and provide comments. Students must review and post on a minimum of 5 other students reports.

Typical Out of Class Assignments

Reading Assignments

1. The student will read the chapter in the textbook on types of fire apparatus equipped with a fire pump and then be prepared to discuss in class the benefits and limitations of centrifugal pumps and positive displacement pumps. 2. The student will read the material on foam equipment and systems and then prepare a list comparing the benefits of the various types of class B foams.

Writing, Problem Solving or Performance

1. Using a diagram, identify the water flow through a centrifugal pump. 2. Develop a matrix showing the proper sequence of steps to troubleshoot a centrifugal pump that does not obtain its "prime".

Other (Term projects, research papers, portfolios, etc.)

Required Materials

- Pumping Apparatus Driver/Operator Handbook
 - Author: International Fire Service Training Association
 - Publisher: Fire Protection Publications, Oklahoma State University
 - Publication Date: 2006
 - Text Edition: 2nd
 - Classic Textbook?:
 - OER Link:
 - OER:
- Fire Service Pump Operator
 - Author: National Fire Protection Association
 - Publisher: Jones & Bartlett
 - Publication Date: 2011
 - Text Edition:
 - Classic Textbook?:
 - OER Link:
 - OER:
- Fire Apparatus Driver/Operator Pump, Aerial, Tiller, and Mobile Water Supply
 - Author: National Fire Protection Association and International Association of Fire Chiefs
 - Publisher: Jones & Bartlett
 - Publication Date: 2016
 - Text Edition: 2nd
 - Classic Textbook?:
 - OER Link:
 - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.