

# Program of Instruction

## Course Syllabus

**Course Title:** Fire Apparatus Engineer

**Course Duration:** 64 hours

**Program:** Fire Fighting

**Course Prerequisites:** Firefighter II

**Course Description:** The Fire Apparatus Engineer course is designed for firefighters who are assigned to operate fire department apparatus in the normal course of their duties. It is designed to develop a firefighter in the areas of principles of water and water systems, mechanical principles of pumps, pumps and pump controls, intake and discharge hydraulics, aerial apparatus considerations, apparatus spotting, fire stream development, pump maintenance, service testing, acceptance testing, and pump troubleshooting. The FAE will be able to generate effective fire streams from hydrants, relay operations, and drafting from static sources. Hose situations will range from single line problems up through multiple-line relay operations to give the students a solid understanding of fire ground hydraulics, as well as practical solutions to be able to apply these concepts to their department.

**Course Requirements:**

- Attend 90% of the course.
- Completion of all daily quizzes.
- Completion of the final exam with a score of at least 75%.
- Complete and pass all practical skill tests administered.

**Course Policies:**

**Safety Policy:** Students shall understand and follow all instructions pertaining to operational safety, as stated by instructors or as written in course materials. Instructors and students shall be mindful of safety at all times. Conduct judged to be unsafe shall be grounds for dismissal from the course.

**Academic Integrity Policy:** IFSI has the responsibility for maintaining academic integrity so as to protect the quality of the education provided through its courses, and to protect those who depend upon our integrity. It is the responsibility of the student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions. Any violation of the code of conduct is grounds for immediate dismissal from the course.

**Grading Policy:** Decisions regarding certificates of course completion shall be made solely by the lead instructor of the course. All grading of exams shall be conducted by qualified instructors. All grading of practical exercises shall be based upon the standards set by the regulatory agency referenced in the course material and IFSI.

**Course Content:**

Module: 1

Title: Introduction and Orientation

Module: 2

Title: Mechanical Principles of Pumps

Module: 3

Title: Features of a Pumper

Module: 4

Title: Properties of Water

Module: 5

Title: Water Supply

Module: 6

Title: Intake Hydraulics

Module: 7

Title: Hydraulics

Module: 8

Title: Aerial Apparatus

Module: 9

Title: Foam Applications

Module: 10

Title: Rural Water Supply

Module: 11

Title: Maintenance and Records

Module: 12

Title: Service Testing

Module: 13

Title: Pumper Operations

**Assignment Summary:**

A take home quiz will be given at the end of each day. These are to be completed and return on the next class period.

**Textbook:**

IFSTA, Pumping Apparatus Driver/Operator Handbook, 2<sup>nd</sup> Edition 1999

**Evaluation Strategy:**

Written and practical skill testing is conducted at intervals within and at the completion of the course.

**Reference List:**

IFSTA, Fire Stream Practices, 7<sup>th</sup> Edition 1989

IFSTA, Fire Department Pumping Apparatus, 7<sup>th</sup> Edition 1989

IFSTA, Pumping Apparatus Driver/Operator Handbook, 1<sup>st</sup> Edition 1999

NFPA 11, Standard for Low Expansion Foam, Edition 1998

NFPA 1001, Standard for Professional Firefighter Qualifications, Edition 1997

NFPA 1002, Standard for Fire Apparatus Driver/Operator, Edition 1998

NFPA 1901, Standard for Fire Service Apparatus, Edition 1999

NFPA 1911, Standard for Service Test of Fire Pump Systems on Fire Apparatus,  
Edition 1997

NFPA 1932, Standard for Use, Maintenance and Service Testing of Fire  
Department Ground Ladders, Edition 1999

## Course Schedule

<b><u>Day 1</u></b>		<b><u>Duration</u></b>
Module 1	Introduction and Orientation	1 ½ hours
Module 2	Mechanical Principles of Pumps	2 ½ hours
<b>Lunch</b>		
Module 3	Features of a Pumper	4 hours

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<b><u>Day 2</u></b>		<b><u>Duration</u></b>
Module 4	Properties of Water	2 ½ hours
Module 5	Water Supply	2 hours
<b>Lunch</b>		
Module 6	Intake Hydraulics	3 ½ hours

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<b><u>Day 3</u></b>		<b><u>Duration</u></b>
Module 7	Hydraulics	8 hours

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<b><u>Day 4</u></b>		<b><u>Duration</u></b>
Module 7	Hydraulics	8 hours

<b><u>Day 5</u></b>		<b><u>Duration</u></b>
Module 8	Aerials	8 hours

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<b><u>Day 6</u></b>		<b><u>Duration</u></b>
Module 9	Foam Applications	2 ½ hours
Module 10	Rural Water Supply	2 ½ hours
<b>Lunch</b>		
Module 11	Maintenance and Records	½ hour
Module 12	Service Testing	2 ½ hours

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<b><u>Day 7</u></b>		<b><u>Duration</u></b>
Module 13	Pumper Operations	3 hours
	Course Review	1 hour
<b>Lunch</b>		
	Practice Session	4 hours

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<b><u>Day 8</u></b>		<b><u>Duration</u></b>
	Final Exam	2 hours
<b>Lunch</b>		
	Practical Stations	6 hours