FRS 203

Firefighters Advanced Skills III

45 clock hours
3 credit hours

Course	Title	Lecture/Skill		Total	Fractional Credit
FRS 2031	Pump Operations II	8	0	8	0.5
FRS 2031	Driver's Training	8	4	12	0.8
FRS 2033	Overhaul II	3	0	3	0.2
FRS 2034	Fire Alarm and Communications II	5	0	5	0.3
FRS 2035	Sprinklers II	7	0	7	0.5
FRS 2036	Practicum	0	55	55	0.7

FRS 2031 **PUMP OPERATIONS LEVEL II**

Lecture	Skill	Fractional Credit
8	0	0.5

Course Description

This course includes the minimum requirements of professional competence of fire service pump operators.

Prerequisites: FRS 2023 or Consent **Corequisite: None**

Task List

1.	Identify the pipe sizes used in water distribution systems for residential, business, and industrial districts.
2.	Identify at least two causes of increased resistance or friction loss with water flowing in water mains.
3.	Identify the NFPA recommended color code system for fire hydrants, or the color code system used in that particular community.
4.	Identify who is responsible for water system maintenance, use, and testing.
5.	Identify private water supply systems and shall explain the operation, care and maintenance of those systems.
6.	Identify three alternative emergency water supply sources.
7.	Identify the components of mobile water supply operations.
8.	Demonstrate the principles of friction loss as they relate to: a. Internal diameter of hose; b. Length of hose line; c. Manner in which hose lines are laid; d. Physical condition of hose; e. Pressure; f. Use of appliances; g. Use of multiple hose lines; h. Use of various nozzles; and i. Velocity of flow.
9.	Identify the following types of fluid pressure encountered in the fire service: a. Flow pressure; b. Negative pressure; c. Normal operating pressure; d. Residual pressure; and e. Static pressure.
10.	Identify the following terms that relate to the basic principles of fire service hydraulics: a. Atmospheric pressure; b. Capacity; c. Displacement; d. Flow (GPM); e. Friction Loss; f. Head pressure (gain or loss); g. Hydrant pressure; h. Net engine pressure; i. Nozzle reaction; j. Pounds per square inch (PSI); k. Pump discharge pressure; l. Vacuum; m. Velocity; and n. Water hammer.
11.	Demonstrate the use of proportions in mathematical calculations as required to solve fire department pumper hydraulics problems.
12.	Identify and demonstrate the determination and use of square roots as required to solve fire department pumper hydraulic problems.
13.	Identify and demonstrate the use of fractions, percentages, and decimal fractions in mathematical calculations

	as required to solve fire department pumper hydraulic problems.
14.	Demonstrate the use of algebraic formulas to solve fire department pumper hydraulic problems.
15.	Given a series of fireground situations and using the written formulas specified determine: a. Nozzle or pump discharge pressures when the length and size of hose, and size of nozzle are given; b. Water flow in gallons per minute (GPM) when the diameter of the orifice are given; c. Friction loss in the supply and attack lines, used by the authority having jurisdiction, when the gpm flow is given; d. Friction loss in siamesed lines when size of hose and gpm flow are given; e. Friction loss in wyed lines when size of hose and gpm flow are given; f. Friction loss in multiple lines when the size of hose and gpm flow are given; and g. An estimated remaining available volume from a hydrant while pumping a given volume.
16.	Given a series of fireground situations, mentally calculate correct pump discharge pressure, gpm, friction loss, and nozzle pressure, using formulas specified by the authority having jurisdiction.
17	Given a series of fireground situations involving various operating pressures, demonstrate the calculation of nozzle reaction of hand and master streams used by the authority having jurisdiction.
18.	Given the necessary information, shall compute the maximum life of a fire department pumper.
19.	Identify three methods of power transfer from the vehicle engine to the pump.
20.	Identify the theory and principles of pumper priming systems.
21.	Identify the theory and principles of pumper pressure relief systems and pressure control governors.
22.	Given a fire department pumper, identify all pump gauges and demonstrate their use.
23.	Identify the auxiliary cooling systems and explain their function.
24.	Given a fire department pumper, demonstrate the method(s) of power transfer from vehicle engine to pump.
25.	Given a fire department pumper and a series of fireground situations, produce effective hand and master streams specified by the authority having jurisdiction.
26.	Given a fire department pumper, shall draft water, and demonstrate a systems check when the pumper will not draft.
27.	Demonstrate the operations of the different types of fire department pumpers used by the authority having jurisdiction.
28.	Given a fire department pumper, properly position, set up the apparatus, and perform the following operations: a. Pump at maximum delivery rate from the apparatus water tank; b. Pump at maximum rated capacity from a hydrant; c. Pump at maximum rated capacity from draft; d. Pump in a relay operation; e. Pump in a tandem pumping operation; and f. Pump in a dual pumping operation.
29.	Given a fire department pumper and a simulated fire scene, demonstrate proper maneuvering and positioning of the apparatus to function from the given source of water.
30.	Given a fire department pumper with a multiple-stage pump, demonstrate the operation of the volume/pressure transfer valve under actual pumping conditions.
31.	Given a fire department pumper, locate, identify, and demonstrate the operation of all equipment carried on or attached to that pumper.
32.	Identify the characteristics and limitations of hard and soft pumper supply hose.
33.	Given a selection of nozzles and tips, identify the type, design operating, nozzle pressure, and flow in gpm for proper operation of each.
34.	Given a fire department pumper, demonstrate the operation of the pumper pressure relief system, or the pressure control governor, or both.
35.	Given a fire department pumper, demonstrate the operation of the auxiliary cooling system.
36.	Given a series of fireground situations identify the capabilities and limitations of the water supply operation.
37.	Identify the factors affecting the effective range of elevated master streams.
38.	Identify the causes and hazards of nozzle reaction of elevated master streams.

Lecture
Instructor Equipment List
Projection screen
Chalkboard or marker board
Overhead projector
Slide projector
TV/VCR

Skills
Instructor Equipment List
Projection screen
Chalkboard or marker board
Overhead projector

Slide projector
TV/VCR
Pumper

Pumper service test equipment
Old FRT Number: 395 / FRT 145

FRS 2032 **DRIVERS TRAINING**

Lecture	Skill	Fractional Credit
8	4	0.8

Course Description
This course includes the minimum requirements of professional competence required for service as a fire apparatus driver.
Prerequisites: FRS 2011, 2013 Valid Driver License Corequisite:

	Task List
1.	Demonstrate the performance of routine test, inspections, and servicing functions required to assure the operational status of fire department vehicles including: a. Battery check; b. Braking system; c. Coolant system; d. Electrical system; e. Fueling; f. Hydraulic fluids; g. Lubrication; h. Oil levels; i. Tire care; j. Steering system; and k. Tools, appliances, and equipment
2.	Demonstrate the recording and reporting, as specified by the authority having jurisdiction, of all servicing functions.
3.	Identify all applicable state and local laws of the authority having jurisdiction, including rules and regulations governing the safe driving and operating of fire department vehicles.
4.	Given a fire department vehicle, identify all automotive gauges and demonstrate their usage.
5.	Given a fire department vehicle, demonstrate the following driving skills: a. Serpentine; b. Alley dock; c. Opposite alley pull in; d. Diminishing clearance; e. Straight line; f. Turn around; g. Lane change; h. Stopping procedures; and i. Parking procedures
6.	Identify and demonstrate the theory and principles of defensive driving techniques, both emergency and non-emergency.
7.	Identify all applicable state and local laws, including rules and regulations, governing the safe driving and operation of all fire department vehicles of the authority having jurisdiction, on emergency response.
8.	Emergency response conditions, demonstrate the legal and safe driving, positioning, and operating of assigned fire department vehicles of the authority having jurisdiction.
9.	Describe the safety precautions necessary when driving during adverse environmental conditions.
10.	Describe the effects on vehicle control of: a. Braking reaction time; b. Load control factors; and c. General steering reactions.

11.	Demonstrate the performance of routine tests, inspections and servicing functions required to assure the operational status of fire department pumpers, including: a. Battery check; b. Booster tank level (if applicable); c. Braking system; d. Coolant system; e. Electrical system; f. Hydraulic fluids; g. Fueling; h. Lubrication i. Oil levels; j. Pumping system; k. Steering systems; l. Tire care; and m. Tools, appliances, and equipment
12.	Given a fire department pumper, demonstrate the following driving tests: a. Serpentine; b. Alley dock; c. Opposite alley pull in; d. Diminishing clearance; e. Straight line; f. Turn around; g. Lane change h. Stopping procedures; and i. Parking procedures

Lecture
Instructor Equipment List

Projection screen
Chalkboard or marker board
Overhead projector
Slide projector
TV/VCR

Skills
Instructor Equipment List

Cones
Chalk
Measuring Device

Student Equipment List

Vehicle

Old FRT Number: 245 / FRT 146

FRS 2033

OVERHAUL LEVEL II

Lecture	Skill	Fractional Credit
3	0	0.2

Course Description

This course includes information pertaining to overhaul including safety precautions, indicators of structural instability, the preservation of evidence and the procedures for restoration of the fire premises.

Prerequisites: FRS 1044 or Consent **Corequisite: None**

Task List

1.	Identify the procedures and safety precautions to follow during overhaul.
2.	List 5 indicators of structural instability.
3.	Identify and preserve evidence of fire cause and origin.
4.	Identify the procedures for restoration of the premises after a fire.

Instructor Equipment List

Projection screen
Chalkboard or marker board
Overhead projector
Slide projector
TV/VCR
Generator lights
Assorted hand and power tools

Old FRT Number: 420 / FRT 147

FRS 2034 **FIRE ALARMS and COMMUNICATIONS LEVEL II**

Lecture	Skill	Fractional Credit
5	0	0.3

Course Description

The policies and procedures concerning ordering and transmitting of multiple alarms and supervisory alarm equipment will be discussed in this course.

Prerequisites: FRS 1045 or Consent **Corequisite: None**

Task List

1.	Define the policy and demonstrate the procedures concerning the ordering and transmitting of multiple alarms of fire and calls for special assistance from the emergency scene.
2.	Identify supervisory alarm equipment provided in the fire station and the prescribed action to be taken upon receipt of designated signals.
3.	Identify fire location indicators provided to direct firefighters to specific locations in protected public or private properties.

Instructor Equipment List

Projection screen
Chalkboard or marker board
Overhead projector
Slide projector
TV/VCR

Old FRT Number: 425 / FRT 148

FRS 2035 **SPRINKLERS LEVEL II**

Lecture	Skill	Fractional Credit
7	0	0.5

Course Description

This course is designed to increase the firefighters knowledge of various types of sprinkler systems and the working of these systems.

Prerequisites: FRS 1048 or Consent **Corequisite: None**

Task List

1.	Identify the sources of water supply for sprinkler systems, including: a. Public water systems; b. Gravity tank; c. Pressure tank; d. Pumps; and e. Fire department connections.
2.	Describe how the direction of water flow through a fire department connection check valve can be determined, including: a. Arrows; and b. Pivot casting.
3.	Identify The location and appearance of the control and operating valves of a sprinkler system, including: a. Outside screw and yoke (OS&Y); b. Post indicator; and c. Wall post indicator.
4.	Identify the main drain valve on an automatic sprinkler system.
5.	Open and close a main drain valve on an automatic sprinkler system.
6.	Identify and define the dangers of the premature closure of a sprinkler main control valve and of using hydrants to supply hose streams when the same water system is supplying the automatic sprinkler system.
7.	Identify the difference between an automatic sprinkler system that affords complete coverage and a partial sprinkler system.
8.	Describe the following types of sprinkler systems: a. Wet pipe; b. Dry pipe; c. Deluge; and d. Residential.
9.	Read and record the indicated pressures on all gauges provided on a standard wet pipe automatic sprinkler system and identify each gauge.
10.	Read and record the indicated pressures on all gauges provided on a standard dry pipe automatic sprinkler system and identify each gauge.
11.	Define the reliability of automatic sprinkler systems and give 8 reasons for unsatisfactory performance.
12.	Given a check valve on the fire department connection to an automatic sprinkler system, demonstrate the direction of water flow through the valve.
13.	Demonstrate methods for augmenting water supplies to sprinkler systems.
14.	Given specific information on a sprinkler system, identify the number of sprinkler heads that can be adequately supplied by various capacity fire department pumpers.
15.	Given specific information on a sprinkler system, calculate the hose layouts, pump discharge pressure, and procedures to adequately supply water to the sprinkler system.
16.	Given specific information on a dry standpipe system, calculate the hose layouts; pump discharge pressure, and procedures to adequately supply water to the dry standpipe system.
17.	Given specific information on a wet standpipe system, calculate the hose layouts; pump discharge pressure, and procedures to adequately supply water to the standpipe system.
18.	Identify the proper methods and procedures to supply a standpipe system if the fire department connection is not usable.

Instructor Equipment List

Dry pumper
Standpipe system
Wet standpipe system
Hose and appliances

Student Equipment List

Personal protective equipment

Old FRT Number: 460 / FRT 149

FRS 2036 **PRACTICUM**

Lecture	Skill	Fractional Credit
0	55	0.7

Course Description

The Practicum provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Practicum do not receive compensation.

Prerequisites: FRS 101 – FRS 104 **Corequisite: None**

Task List

1.	Gain career awareness and the opportunity to test career choice(s).
2.	Receive work experience related to career interests prior to graduation.
3.	Integrate classroom studies with work experiences.
4.	Receive exposure to facilities and equipment unavailable in a classroom setting.
5.	Increase employability potential after graduation.

Instructor Equipment List

NA

Old FRT Number: 499 / FRT 150