Title: FFP 1302 / BFST1302/ ATPC 1302 Syllabus

Revision: May 17, 2018

Section I - Course Information

Course Title: Apparatus Operations

Course Number(s): FFP 1302 / BFST1302 / ATPC 1302

Class Days/Time: If being taught at the Florida State Fire College Campus 11655 NW Gainesville Road, Ocala, FL 34482 Bldg. C – Classrooms - Monday-Friday 8 a.m.- 5 p.m. 5 additional hours out of class work may be required.

Section II - Points of Contact

Training Supervisor:
Name: Frank Ennist,
Email: Frank.Ennist@myfloridacfo.com
Work Phone: 352-369-2838
Bldg. C Room 158

Program Manager/Instructor:
Name:
Email:
Work Phone:

Section III - Course Material


Prerequisite(s): FFP 1301 / BFST 1301 / ATPC 1301, Fire Service Hydraulics

Continuing Educations Units (CEU’s): None

Pre-Course Assignment: None

Required Materials: Appropriate apparatus, classroom, adjunct for visual aids, white board
Section III – Course Description

This course and the exams are based on NFPA 1002: Standard for Fire Apparatus Driver / Operator Professional Qualifications, and may lead to certifications. This course is designed for the firefighter who wishes to advance to the next level of his/her career.

NOTE: Students must bring gloves, hardhat and proper attire for fire stream operations exercises.

Section IV - Instructor Information

Academic integrity is crucial to the learning community and indicates respect for the college, the instructor, the course, your classmates, and yourself. Any violation of this trust, including but not limited to cheating, plagiarism, collusion, or using or having any content of an un-administered test, will result in immediate dismissal from the course. Under Florida Statute 633, any student dismissed for academic dishonesty can be refused acceptance for any course administered by FSFC.

Qualification Description
Training Provider Message
You must be certified by the State of Florida as an Instructor I, II, or III, or a State of Florida recognized Fire Department, or hold a certification as a Single Course Exemption Instructor and be a state certified pump operator. Applications can be made through the Bureau of Fire Standards and Training. Organization Providers are Schools, Government Entities, and Businesses that need to apply and be approved by the Florida State Fire College.

Instructor Message
You may teach courses for this type of Certification or Competency only if you hold the certification, and the appropriate disciplines.

Method of Instruction/Level of Learning: Lecture, discussions, demonstration, practical, role-playing, group work / Comprehension, Psychomotor

Chapter 1: Types of Apparatus Equipped with a Pump
1. Describe fire department pumpers.
2. Describe initial attack fire apparatus.
3. Describe mobile water supply apparatus.
4. Distinguish among specialty fire apparatus.
5. Identify apparatus-mounted special systems.

Chapter 2: Apparatus Inspection and Maintenance
1. Explain a systematic maintenance program. [NFPA® 1002, 4.2.1, 4.2.2, 4.3.7, 5.1.1]
2. Explain the importance of accurate documentation, reporting, and follow-up for apparatus inspections. [NFPA® 1002, 4.2.1, 4.2.2, 4.3.7, 5.1.1]
3. Describe actions taken to ensure vehicle cleanliness.
4. Summarize considerations for conducting an apparatus inspection. [NFPA® 1002, 4.2.1, 4.2.2, 4.3.7, 5.1.1, 10.1.1]
5. Describe actions taken to ensure batteries are operable. [NFPA® 1002, 4.2.1, 4.3.7]
6. Describe general fire suppression equipment maintenance procedures. [NFPA®]
7. Clean the interior and wash and wax the exterior of a fire department apparatus. [Skill Sheet 2-1]
8. Perform a routine walk-around maintenance inspection. [NFPA® 1002, 4.2.1, 4.2.2; Skill Sheet 2-2]
9. Perform an in-cab operational inspection. [NFPA® 1002, 4.2.1, 4.2.2, 4.3.7; Skill Sheet 2-3]
10. Test apparatus road and parking brakes. [NFPA® 1002, 4.2.1; Skill Sheet 2-4]
11. Perform engine compartment inspection and routine preventive maintenance. [NFPA® 1002, 4.2.1, 4.2.2; Skill Sheet 2-5]
12. Charge an apparatus battery. [NFPA® 1002, 4.2.1; Skill Sheet 2-6]
13. Perform daily inspections for apparatus equipped with a fire pump. [NFPA® 1002, 4.2.1, 4.2.2, 5.1.1; Skill Sheet 2-7]
14. Perform weekly inspections for apparatus equipped with a fire pump. [NFPA® 1002, 4.2.1, 4.2.2, 5.1.1; Skill Sheet 2-8]
15. Perform a hard intake hose service test. [NFPA® 1002, 4.2.2, 5.1.1; Skill Sheet 2-9]

Chapter 3: Apparatus Safety and Operating Emergency Vehicles
1. Identify the considerations taken when selecting qualified driver/operators.
2. List driving regulations that affect apparatus driver/operators. [NFPA® 1002, 4.3.1, 4.3.6]
3. Detect reasons for accidents. [NFPA® 1002, 4.3.1, 4.3.6]
4. Review apparatus rider safety considerations. [NFPA® 1002, 4.3.1, 4.3.6]
5. Explain considerations to take when starting, idling, and shutting down apparatus. [NFPA® 1002, 4.3.1]
6. Explain considerations for operation of an apparatus. [NFPA® 1002, 4.3.1, 4.3.6, 7.2.2]
7. Explain apparatus emergency response considerations. [NFPA® 1002, 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6]
8. Describe types of emergency operations warning devices. [NFPA® 1002, 4.3.1, 4.3.6]
9. Identify types of traffic control devices. [NFPA® 1002, 4.3.1, 4.3.6]
10. Explain considerations when stopping and braking apparatus. [NFPA® 1002, 4.3.1, 4.3.6]
11. Explain considerations when backing apparatus. [NFPA® 1002, 4.3.2, 4.3.3, 4.3.4, 4.3.6]
12. Explain considerations when performing tillering operations. [NFPA® 1002, 7.2.2]
13. Describe driving exercises and evaluation methods. [NFPA® 1002, 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6]
14. Summarize considerations for working safely on and around fire apparatus.
15. Start, idle, and shut down a fire service apparatus. [NFPA® 1002, 4.3.1; Skill Sheet 3-1]
16. Drive a fire service apparatus. [NFPA® 1002, 4.3.1; Skill Sheet 3-2]
17. Back apparatus using mirrors. [NFPA® 1002, 4.3.2, 4.3.3, 4.3.4, 4.3.5; Skill Sheet 3-3]
18. Perform various driving exercises. [NFPA® 1002, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6; Skill Sheet 3-4]
19. Perform various road tests in a fire service apparatus. [NFPA® 1002, 4.3.1; Skill Sheet 3-5]

Chapter 4: Positioning Apparatus
1. Describe positioning of pumper for fire attack. [NFPA® 1002, 5.2.1, 5.2.2, 5.2.4]
2. Describe positioning water source supply pumper. [NFPA® 1002, 5.2.1, 5.2.2, 5.2.4]
3. Summarize apparatus positioning considerations for wildland fire attack.
4. Identify considerations for special positioning situations. [NFPA® 1002, 5.2.1, 5.2.2, 5.2.4]
5. Position pumper and make large diameter intake hose connections. [NFPA® 1002, 5.2.1, 5.2.2, 5.2.4; Skill Sheet 4-1]
6. Position pumper and connect to 2½-inch (65 mm) hydrant outlets. [NFPA® 1002, 5.2.1, 5.2.2, 5.2.4; Skill Sheet 4-2]
7. Position pumper and make multiple intake connections. [NFPA® 1002, 5.2.1, 5.2.2, 5.2.4; Skill Sheet 4-3]
8. Position pumper and make connections for a dual pumping operation. [NFPA® 1002, 5.2.1, 5.2.2, 5.2.4; Skill Sheet 4-4]
9. Position pumper and make connections for a tandem pumping operation. [NFPA® 1002, 5.2.1, 5.2.2, 5.2.4; Skill Sheet 4-5]

Chapter 5: Principles of Water
1. Describe the characteristics of water.
2. Identify the advantages and disadvantages of water.
3. Summarize facts about water pressure and velocity.
4. Summarize the principles of friction loss. [NFPA® 1002, 5.2.1, 5.2.2]
5. Identify how friction loss principles can be applied to the fire service. [NFPA® 1002, 5.2.1, 5.2.2]
6. Identify the principles of municipal water supply systems.
7. Describe private water supply systems. [NFPA® 1002, 5.2.1, 5.2.2]

Chapter 6: Hose Nozzles and Flow Rates
1. Distinguish among types of fire hose nozzles. [NFPA® 1002, 5.2.1]
2. Identify considerations for selecting nozzles. [NFPA® 1002, 5.2.1]
3. Distinguish among types of special purpose nozzles. [NFPA® 1002, 5.2.1]
4. Summarize facts about nozzle pressure and reaction. [NFPA® 1002, 5.2.1]
Chapter 7: Theoretical Pressure Calculations
1. Summarize facts about total pressure loss. [NFPA® 1002, 5.2.1, 5.2.2]
2. Identify how various hose layouts affect total pressure loss. [NFPA® 1002, 5.2.4]
3. Explain how to determine pump discharge pressure. [NFPA® 1002, 5.2.1, 5.2.2]
4. Test hose carried on fire department apparatus to determine friction loss. [NFPA®
   1002, 5.2.1, 5.2.2, 5.1.1, Skill Sheet 7-1]

Chapter 8: Fireground Hydraulic Calculations
1. Describe flowmeters and flowmeter applications. [NFPA® 1002, 5.2.1, 5.2.2]
2. Distinguish between manual and electronic hydraulic calculators. [NFPA® 1002,
   5.2.1, 5.2.2]
3. Describe how pump charts are used in the fire service. [NFPA® 1002, 5.2.1, 5.2.2]
4. Explain how the Condensed Q formula can be used on the fireground. [NFPA® 1002,
   5.2.1, 5.2.2]
5. Describe the gpm flowing method. [NFPA® 1002, 5.2.1, 5.2.2]

Chapter 9: Fire Pump Theory
1. Distinguish among types of positive displacement pumps. [NFPA® 1002, 5.2.1, 5.2.2]
2. Summarize facts about the operation of centrifugal pumps. [NFPA® 1002, 5.2.1,
   5.2.2]
3. Distinguish among various pump mounting and drive arrangements. [NFPA® 1002,
   5.2.1, 5.2.2]
4. Describe intake and discharge piping. [NFPA® 1002, 5.2.1, 5.2.2]
5. Summarize facts about valves used in a piping system. [NFPA® 1002, 5.2.1, 5.2.2]
6. Explain the operation of automatic pressure control devices. [NFPA® 1002, 5.2.1,
   5.2.2]
7. Summarize facts about priming methods and devices. [NFPA® 1002, 5.2.1, 5.2.2]
8. Identify characteristics of pump panel instrumentation. [NFPA® 1002, 5.2.1, 5.2.2]
9. Describe types of auxiliary cooling devices. [NFPA® 1002, 5.2.1, 5.2.2]

Chapter 10: Operating Fire Pumps
1. Explain making the pump operational. [NFPA® 1002, 5.1.1, 10.2.2]
2. Summarize facts about operating from the water tank. [NFPA® 1002, 5.1.1, 10.2.2]
3. Explain considerations when operating from a pressurized supply source. [NFPA®
   1002, 5.1.1, 10.2.2]
4. Summarize facts about operating from a static water supply source. [NFPA® 1002,
   5.2.1, 5.2.2]
5. Describe actions taken for sprinkler and standpipe support. [NFPA® 1002, 5.2.4]
6. Explain actions taken when troubleshooting pumping operations. [NFPA® 1002,
   5.1.1]
7. Engage and disengage a power take-off (PTO). [NFPA® 1002, 5.2.1, 5.2.2, 5.2.4;
   Skill Sheet 10-1]
8. Engage and disengage a pump. [NFPA® 1002, 5.2.1, 5.2.2, 5.2.4; Skill Sheet 10-2]
9. Perform pump operations from the apparatus water tank. [NFPA® 1002, 5.2.1; Skill Sheet 10-3]
10. Make the transition from the apparatus water tank to an external pressurized water supply. [NFPA® 1002, 5.2.1; Skill Sheet 10-4]
11. Operate from a pressurized water source. [NFPA® 1002, 5.2.1; Skill Sheet 10-5]
12. Draft from a static water supply. [NFPA® 1002, 5.2.1, 5.2.2, 5.2.4; Skill Sheet 10-6]
13. Supply water to a sprinkler/standpipe system. [NFPA® 1002, 5.2.4; Skill Sheet 10-7]

### Chapter 11: Static Water Supply Sources
1. Explain the principles of lift. [NFPA® 1002, 5.2.1]
2. Summarize considerations when drafting from a natural static water supply source. [NFPA® 1002, 5.2.1, 10.2.1, 10.2.2, 10.2.3]
3. Describe types of artificial static water supply sources. [NFPA® 1002, 5.2.1]
4. Dam a stream with a ladder and salvage cover. [NFPA® 1002, 5.2.1, 5.2.2; Skill Sheet 11-1]

### Chapter 12: Relay Pumping Operations
1. Describe relay apparatus and equipment. [NFPA® 1002, 5.2.2]
2. Explain relay pumping operational considerations. [NFPA® 1002, 5.2.2]
3. Summarize general guidelines for relay operations. [NFPA® 1002, 5.2.2]
4. Describe the open relay method. [NFPA® 1002, 5.2.2]
5. Summarize facts about the closed relay method. [NFPA® 1002, 5.2.2]
6. Operate in an open relay. [NFPA® 1002, 5.2.2; Skill Sheet 12-1]
7. Operate in a closed relay. [NFPA® 1002, 5.2.2; Skill Sheet 12-2]

### Chapter 13: Water Shuttle Operations
1. Identify water shuttle apparatus. [NFPA® 1002, 10.2.3]
2. Summarize considerations taken for the setup of a water shuttle. [NFPA® 1002, 10.2.1]
3. Describe fill site operations. [NFPA® 1002, 10.2.1]
4. Distinguish among dump site operational methods. [NFPA® 1002, 10.2.2, 10.2.3]
5. Explain methods of evaluating tender performance. [NFPA® 1002, 10.1.1, 10.2.2, 10.2.3]
6. Verify operational readiness of mobile water supply apparatus. [NFPA® 1002, 10.1.1; Skill Sheet 13-1]
7. Operate at a fill site as part of a water shuttle operation. [NFPA® 1002, 10.2.1; Skill Sheet 13-2]
8. Operate at a portable water tank dump site as part of a water shuttle operation. [NFPA® 1002, 10.2.2, 10.2.3; Skill Sheet 13-3]
9. Establish, operate, and shut down a multiple portable tank water shuttle dump site. [NFPA® 1002, 10.2.2, 10.2.3; Skill Sheet 13-4]
Chapter 14: Foam Equipment and Systems
1. Summarize facts about principles of foam. [NFPA® 1002, 5.2.3]
2. Distinguish among types of foam concentrates used in firefighting. [NFPA® 1002, 5.2.3]
3. Explain the operation of low energy foam proportioning systems. [NFPA® 1002, 5.2.3]
4. Describe high energy foam generating systems. [NFPA® 1002, 5.2.3]
5. Distinguish among portable foam application devices. [NFPA® 1002, 5.2.3]
6. Identify reasons for the production of poor quality foam or the lack of foam production when using an in-line proportioner. [NFPA® 1002, 5.1.1, 5.2.3, 10.1.1]
7. Identify foam application techniques. [NFPA® 1002, 5.1.1, 5.2.3, 10.1.1]
8. Explain the environmental impact of foam. [NFPA® 1002, 5.2.3]
9. Identify durable agents. [NFPA® 1002, 5.2.3]
10. Install and operate an in-line foam eductor. [NFPA® 1002, 5.2.3; Skill Sheet 14-1]

Chapter 15: Apparatus Testing
1. Distinguish among pre-performance tests for pumping apparatus. [NFPA® 1002, 4.2.2, 5.1.1]
2. Summarize facts about performance testing of fire pumps. [NFPA® 1002, 4.2.2, 5.1.1]
3. Describe methods for testing a foam proportioning system. [NFPA® 1002, 4.2.2, 5.1.1]
4. Perform an engine speed test. [NFPA® 1002, 4.2.2, 5.1.1; Skill Sheet 15-1]
5. Perform a vacuum test. [NFPA® 1002, 4.2.2, 5.1.1; Skill Sheet 15-2]
6. Prepare the pumper and complete a performance test of a fire pump including the priming system, pumping overload, and pressure control tests. [NFPA® 1002, 4.2.2, 5.1.1; Skill Sheet 15-3]
7. Perform discharge gauge and flowmeter operational tests. [NFPA® 1002, 4.2.2, 5.1.1; Skill Sheet 15-4]
8. Perform a tank-to-pump flow test. [NFPA® 1002, 4.2.2, 5.1.1; Skill Sheet 15-5]
## Section VI – Course Content and Outline/Plan of Instruction

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Chapter Title</th>
<th>Suggested Time in Hours</th>
<th>Text Reference</th>
<th>Learning Activities or Skill Sheets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Types of Apparatus Equipped with a Pump</td>
<td>7</td>
<td>10-25</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Apparatus Inspection and Maintenance</td>
<td>7</td>
<td>26-75</td>
<td>Skill Sheets 2-1 through 2-9</td>
</tr>
<tr>
<td>3</td>
<td>Apparatus Safety and Operating Emergency Vehicles</td>
<td>15</td>
<td>76-131</td>
<td>Skill Sheets 3-1 through 3-5</td>
</tr>
<tr>
<td>4</td>
<td>Positioning Apparatus</td>
<td>7</td>
<td>132-162</td>
<td>Skill Sheets 4-1 through 4-5</td>
</tr>
<tr>
<td>5</td>
<td>Principles of Water</td>
<td>8</td>
<td>164-189</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Hose Nozzles and Flow Rates</td>
<td>4</td>
<td>190-205</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Theoretical Pressure Calculations</td>
<td>4</td>
<td>206-277</td>
<td>Skill Sheet 7-1</td>
</tr>
<tr>
<td>8</td>
<td>Fireground Hydraulic Calculations</td>
<td>3</td>
<td>278-290</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Fire Pump Theory</td>
<td>14</td>
<td>292-330</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Operating Fire Pumps</td>
<td>12</td>
<td>332-398</td>
<td>Skill Sheets 10-1 through 10-7</td>
</tr>
<tr>
<td>11</td>
<td>Static Water Supply Sources</td>
<td>5</td>
<td>400-420</td>
<td>Skill Sheet 11-1</td>
</tr>
<tr>
<td>12</td>
<td>Relay Pumping Operations</td>
<td>4</td>
<td>422-438</td>
<td>Skill Sheets 12-1 and 12-2</td>
</tr>
<tr>
<td>13</td>
<td>Water Shuttle Operations</td>
<td>9</td>
<td>440-475</td>
<td>Skill Sheets 13-1 through 13-4</td>
</tr>
<tr>
<td>14</td>
<td>Foam Equipment and Systems</td>
<td>11</td>
<td>476-511</td>
<td>Skill Sheet 14-1</td>
</tr>
<tr>
<td>15</td>
<td>Apparatus Testing</td>
<td>6</td>
<td>512-536</td>
<td>Skill Sheets 15-1 through 15-5</td>
</tr>
</tbody>
</table>