



Wildland Fire Apparatus Operations (2024)

Course Plan

Course Details

Certification:	Wildland Fire Apparatus Driver/Operator (2024)
CTS Guide:	Fire Apparatus Driver/Operator (2024)
Description:	This course provides the knowledge and skills needed to operate and perform preventive maintenance on a wildland fire apparatus. Topics include routine tests, inspections, and servicing functions on the systems and components unique to wildland fire apparatus; operating a wildland fire apparatus; and producing an effective fire stream.
Designed For:	Personnel who drive and operate a wildland fire apparatus
Course Prerequisites:	OSFM certified Fire Fighter 1 or certified Fire Fighter 2 tenured path (Appointment to the rank of Officer (Lieutenant or higher) waives this prerequisite. Appointment to the CAL FIRE rank of Fire Apparatus Engineer is equivalent to Officer level. Performing in an "acting" capacity does not fulfill this requirement.) FADO 1A: Fire Apparatus Driver/Operator (2017 or newer) FADO 1B: Pumping Apparatus Operations (2017 or newer) One of the following driver's licenses: Class C fire fighter endorsed, Commercial A, or Commercial B
Standard:	Complete all activities, skills, and tests Complete the summative test with a minimum score of 80%
Hours (Total):	27 hours (7 lecture / 18 application / 2 testing)
Maximum Class Size:	30
Instructor Level:	SFT Wildland Fire Apparatus Driver/Operator Registered Instructor
Instructor/Student Ratio:	1:30 (lecture) / 1:8 (application)
Restrictions:	Sufficient fire apparatus and space to accommodate classroom and skills training
SFT Designation:	CFSTES

Table of Contents

Course Details	1
Required Resources	3
Instructor Resources	3
Online Instructor Resources	3
Student Resources	3
Facilities, Equipment, and Personnel	3
Timetable	5
Timetable Key	5
Unit 1: Introduction	7
Topic 1-1: Orientation and Administration	7
Topic 1-2: Wildland Fire Apparatus Driver/Operator Certification	8
Unit 2: Preventive Maintenance	10
Topic 2-1: Performing and Documenting Visual and Operational Checks	10
Unit 3: Operations	11
Topic 3-1: Operating a Wildland Fire Apparatus	11
Topic 3-2: Producing an Effective Fire Stream	13
How to Read a Course Plan	15

Required Resources

Instructor Resources

To teach this course, instructors need:

- One of the following textbooks
 - *Fire Apparatus Driver/Operator: Pump, Aerial, Tiller, and Mobile Water Supply* (Jones & Bartlett, current edition)
 - *Pumping and Aerial Apparatus Driver/Operator Handbook* (IFSTA, current edition)
- Maintenance and inspection forms
- Manufacturer's specifications and requirements

Online Instructor Resources

The following instructor resources are available online at <https://osfm.fire.ca.gov/what-we-do/state-fire-training/professional-certifications>:

- Wildland Fire Apparatus Operations required activities
 - Activity 3-1: Operate a Wildland Fire Apparatus on and off Road
 - Activity 3-2(a): Produce an Effective Fire Stream from a Water Tank
 - Activity 3-2(b): Produce an Effective Fire Stream from a Pressurized Water Source
 - Activity 3-2(c): Produce an Effective Fire Stream from a Static Water Source

Student Resources

To participate in this course, students need:

- Textbook selected by instructor
- Personal protective equipment (minimum = long pants, wildland jacket, gloves, helmet, footwear with toe protection)

Facilities, Equipment, and Personnel

The following facilities, equipment, or personnel are required to deliver this course:

- Standard learning environment or facility
 - Writing board or paper conference pads
 - Markers, erasers
 - Computer or tablet with presentation or other viewing software
 - Amplification devices
 - Projector and screen
- Sufficient wildland fire apparatus to accommodate the students in the class
 - Recommend at least 30 minutes of drive time per student across Topics 3-1 and 3-2
- Adequate space and terrain for required activities
- Water tank
- Pressurized water source (hydrant or supply line from another pumping apparatus)

- Static water source (drafting pit, portable tank, or natural water source)
- Tools and equipment for inspection and testing
- Hard suction hose
- Foam portioning system
- Foam or foam substitute
- Tools and equipment
- Personal protective equipment (students)

Timetable

Segment	Lecture	Application	Unit Total
Unit 1: Introduction			
Topic 1-1: Orientation and Administration	0.5	0.0	
Topic 1-2: Wildland Fire Apparatus Driver/Operator Certification	0.5	0.0	
Unit 1 Totals	1.0	0.0	1.0
Unit 2: Preventive Maintenance			
Topic 2-1: Performing and Documenting Visual and Operational Checks	2.0	1.0	
Unit 2 Totals	2.0	1.0	3.0
Unit 3: Operations			
Topic 3-1: Operating a Wildland Fire Apparatus	2.5	*	
Topic 3-2: Producing an Effective Fire Stream	1.5	*	
Unit 3 Totals	4.0	17.0	21.0
Summative Assessment			
Determined by AHJ or educational institution	0.0	2.0	0.0
Skills Practice (Lab / Sets and Reps)			
Determined by AHJ or educational institution	0.0	0.0	0.0
Course Totals	7.0	20.0	27.0

* Individual application time determined by instructor for a total of 17 hours for Unit 3. Recommend at least 30 minutes of drive time per student across Topics 3-1 and 3-2.

Timetable Key

1. The Timetable documents the amount of time required to deliver the content included in the course plan.
2. Time is documented using the quarter system:
 - 15 min. = 0.25 hours
 - 30 min. = 0.50 hours
 - 45 min. = 0.75 hours
 - 60 min. = 1.00 hours
3. The Course Totals do not reflect time for lunch (1 hour) or breaks (10 minutes per each 50 minutes of instruction or assessment). It is the instructor's responsibility to add this time based on the course delivery schedule.

4. Application (activities, skills exercises, and formative testing) time will vary depending on the number of students enrolled. The Application time documented is based on the maximum class size identified in the Course Details section.
5. Summative Assessments are determined and scheduled by the authority having jurisdiction. These are not the written or psychomotor State Fire Training certification exams. These are in-class assessments to evaluate student progress and calculate course grades.

Unit 1: Introduction

Topic 1-1: Orientation and Administration

Terminal Learning Objective

At the end of this topic a student will be able to identify facility and classroom requirements and identify course objectives, events, requirements, assignments, activities, skills exercises, resources, evaluation methods, and participation requirements in the course syllabus.

Enabling Learning Objectives

1. Identify facility requirements
 - Restroom locations
 - Food locations
 - Smoking locations
 - Emergency procedures
2. Identify classroom requirements
 - Start and end times
 - Breaks
 - Electronic device policies
 - Special needs and accommodations
 - Other requirements as applicable
3. Review course syllabus
 - Course objectives
 - Calendar of events
 - Course requirements
 - Student evaluation process
 - Assignments
 - Activities and skills exercises
 - Required student resources
 - Class participation requirements

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Instructor Notes

1. None

Topic 1-2: Wildland Fire Apparatus Driver/Operator Certification

Terminal Learning Objective

At the end of this topic a student will be able to identify the requirements for Wildland Fire Apparatus Driver/Operator certification and be able to describe the certification task book and testing process.

Enabling Learning Objectives

1. Identify different levels of certification in the Fire Apparatus Driver/Operator certification track
 - Pumping Apparatus
 - Aerial Apparatus
 - Tillered Apparatus
 - Wildland Fire Apparatus
 - Water Tender
2. Identify the prerequisites for certification
 - One of the following:
 - OSFM Fire Fighter 1 certification **or**
 - Appointment to the rank of Officer (Lieutenant or higher) or CAL FIRE rank of Fire Apparatus Engineer (Performing in an “acting” capacity does not fulfill this requirement.) **and**
 - Valid Class C Firefighter Endorsed **or** Commercial A **or** Commercial B driver’s license (per California Vehicle Code, Section 12804.11)
3. Identify the courses required for certification
 - FADO 1A: Fire Apparatus Driver/Operator (2015 or newer)
 - FADO 1B: Pumping Apparatus Operations (2015 or newer)
 - FADO 1E: Wildland Fire Apparatus Operations (2015 or newer)
4. Identify the exams required for certification
 - No exams outside of class formative and summative testing
5. Identify the task book requirements for certification
 - Pumping Apparatus Certification Task Book (2024)
 - Wildland Fire Apparatus Certification Task Book (2024)
6. Identify the experience requirements for certification (both required)
 - A minimum of one year full-time paid or two years’ volunteer or part-time paid experience in a recognized California fire agency with the primary responsibility as a Pumping Apparatus Driver/Operator **and**
 - A minimum of one year full-time paid or two years’ volunteer or part-time paid experience in a recognized California fire agency with the primary responsibility as a driver/operator on the apparatus for which the candidate seeks certification
7. Identify the position requirements for certification
 - The position requirement is met when the applicant fulfills the role of the specific duties as defined by the fire chief
8. Describe the certification task book process
9. Describe the certification testing process

- Not applicable

Discussion Questions

1. Determined by instructor

Application

1. Determined by instructor

Instructor Notes

1. None

Unit 2: Preventive Maintenance

Topic 2-1: Performing and Documenting Visual and Operational Checks

Terminal Learning Objective

At the end of this topic a student, given a wildland fire apparatus, tools and equipment, manufacturer's specifications, inspection forms, and AHJ policies and procedures, will be able to perform and document the visual and operational checks on the systems and components unique to wildland fire apparatus (water tank and/or other extinguishing agent levels (if applicable), pumping systems, foam systems, four-wheel drive system), in addition to those in 11.2.1 in NFPA 1010 (2024), so that the operational status is verified.

Enabling Learning Objectives

1. Describe wildland fire apparatus systems and components
 - Foam systems
 - Pumping systems
 - Water tank and/or other extinguishing agent levels (if applicable)
 - Four-wheel drive system
2. Describe manufacturer's specifications and requirements
3. Describe AHJ policies and procedures including documentation requirements
4. Describe inspection requirements when transitioning from off-road to on-road operations
5. Inspect wildland fire apparatus
6. Use hand tools and equipment
7. Recognize system problems and out-of-service criteria
8. Correct any deficiency noted according to policies and procedures and/or manufacturer's specifications and requirements

Discussion Questions

1. What equipment is unique to a wildland fire apparatus?
2. Why is it important to do a pre-trip and post-trip inspection?
3. What should be inspected when transitioning from off-road to on-road driving?
4. How do you maintain the four-wheel drive components during the off-season?
5. How can off-road driving affect the air filters?

Application

1. Given a wildland fire apparatus, inspection forms, and tools and equipment, divide students into groups and have each group perform a wildland fire apparatus inspection and present their findings.

Instructor Notes

1. None

CTS Guide Reference: CTS 12-1

Unit 3: Operations

Topic 3-1: Operating a Wildland Fire Apparatus

Terminal Learning Objective

At the end of this topic a student, given a wildland fire apparatus, predetermined route on and off of a public way that incorporates the maneuvers and features that the driver/operator is expected to encounter during normal operations, applicable laws and regulations, and AHJ policies and procedures, will be able to operate a wildland fire apparatus so that the vehicle is operated in compliance with all applicable AHJ rules and regulations and the operational limitations of the apparatus.

Enabling Learning Objectives

1. Recognize wildland fire apparatus resource typing
2. Explain the effects of braking reaction time and load factors while driving on- and off-road
3. Explain the effects of high center of gravity on:
 - Roll-over potential
 - General steering reactions
 - Speed
 - Centrifugal force
4. Identify applicable laws and regulations
5. Identify policies and procedures of the jurisdiction
6. Describe the principles of:
 - Skid avoidance
 - Night driving
 - Shifting
 - Gear patterns
7. Describe how to negotiate:
 - Intersections
 - Railroad crossings
 - Bridges
 - Transition from on-road to off-road
 - Dozer trails (non-developed roadways)
 - Hillside/incline driving, braking, and turning
8. Identify weight and height limitations for both roads and bridges
9. Describe how to identify and operate apparatus gauges (if applicable)
10. Explain operational limits
 - 2-wheel vs. 4-wheel drive
 - 4-wheel drive high vs. 4-wheel drive low
11. Identify potential off-road wildland fire apparatus hazard scenarios
 - Vehicle slides off roadway
 - Vehicle gets stuck
 - Mechanical failure

- Vehicle cannot navigate terrain
 - Other
12. Identify communication needs between wildland fire apparatus driver/operator and crew
 - Verbal
 - Non-verbal
 13. Operate passenger restraint devices
 14. Maintain safe following distances
 15. Maintain control of the wildland fire apparatus while accelerating, decelerating, and turning, given road, weather, and traffic conditions
 16. Operate the wildland fire apparatus under:
 - Adverse environmental conditions
 - Adverse driving surface conditions
 - Nonemergency conditions
 17. Use apparatus gauges and controls (if applicable)

Discussion Questions

1. How do you determine if a bridge is safe to cross?
2. What are some ways to estimate slope in the field?
3. When should you inhibit exhaust regeneration?
4. When should you engage the front axle?
5. How does the use of the auxiliary brake differ between on- and off-road driving?
6. What tactics can you use to maintain control when encountering uneven road surfaces?
7. What is the safest following distance on a mid-slope road?
8. In what situations might you use a spotter?
9. What are some driving considerations when traveling in strike team formation?

Application

1. Given pictures of wildland driving environments, have students identify and discuss hazards and mitigation techniques.
2. Activity 3-1: Operate a Wildland Fire Apparatus on and off Road

Instructor Notes

1. None

CTS Guide Reference: CTS 13-1

Topic 3-2: Producing an Effective Fire Stream

Terminal Learning Objective

At the end of this topic a student, given a wildland fire apparatus, water tank, pressurized water source, and static water source, will be able to produce an effective fire stream so that the pump is engaged, all pressure-control and vehicle safety devices are set, the rated flow of the nozzle is achieved, and the apparatus is monitored for potential problems.

Enabling Learning Objectives

1. Describe hydraulic calculations for friction loss and flow using both written formulas and estimation methods
2. Describe safe operation of the pump
3. Describe correct apparatus placement
4. Describe personal safety considerations
5. Identify the reliability of static water sources
6. Describe mobile attack operations
 - Hoseline selection
 - Pump engagement
 - Vegetation and terrain considerations
 - Communications
 - Tactics
 - Pressure relief (valve operations)
7. Identify problems related to:
 - Small diameter or dead-end mains
 - Low-pressure systems
 - Private water supply systems
8. Position a wildland fire apparatus to obtain water from:
 - A fire hydrant
 - At a static water source
 - Another apparatus
9. Position apparatus for fire attack
10. Engage the fire pump
 - Mid-ship
 - PTO
 - Auxiliary driven
 - Hydrostatic
11. Draft from a static water source
12. Operate pumping apparatus pressure control systems
13. Operate the volume/pressure transfer valve (multistage pumps only)
14. Operate auxiliary cooling systems
15. Make the transition between internal and external water sources
16. Assemble hose lines, nozzles, valves, and appliances

Discussion Questions

1. What is the importance of water conservation and how do you achieve it?

2. What are the dangers of mobile attack with personnel in front of the engine on a hose line?
3. What needs to be considered when spotting an apparatus at a static water source?
4. How do you determine the pump discharge pressure when you can no longer see the nozzle?
5. How do elevation and distance affect discharge pressure?

Application

1. Activity 3-2(a): Produce an Effective Fire Stream from a Water Tank
2. Activity 3-2(b): Produce an Effective Fire Stream from a Pressurized Water Source
3. Activity 3-2(c): Produce an Effective Fire Stream from a Static Water Source

Instructor Notes

1. Candidates need to complete all three activities.

CTS Guide Reference: CTS 14-1

How to Read a Course Plan

A course plan identifies the details, logistics, resources, and training and education content for an individual course. Whenever possible, course content is directly tied to a national or state standard. SFT uses the course plan as the training and education standard for an individual course. Individuals at fire agencies, academies, and community colleges use course plans to obtain their institution's consent to offer course and provide credit for their completion. Instructors use course plans to develop syllabi and lesson plans for course delivery.

Course Details

The Course Details segment identifies the logistical information required for planning, scheduling, and delivering a course.

Required Resources

The Required Resources segment identifies the resources, equipment, facilities, and personnel required to deliver the course.

Unit

Each Unit represents a collection of aligned topics. Unit 1 is the same for all SFT courses. An instructor is not required to repeat Unit 1 when teaching multiple courses within a single instructional period or academy.

Topics

Each Topic documents a single Terminal Learning Objective and the instructional activities that support it.

Terminal Learning Objective

A Terminal Learning Objective (TLO) states the instructor's expectations of student performance at the end of a specific lesson or unit. Each TLO includes a task (what the student must be able to do), a condition (the setting and supplies needed), and a standard (how well or to whose specifications the task must be performed). TLOs target the performance required when students are evaluated, not what they will do as part of the course.

Enabling Learning Objectives

The Enabling Learning Objectives (ELO) specify a detailed sequence of student activities that make up the instructional content of a lesson plan. ELOs cover the cognitive, affective, and psychomotor skills students must master in order to complete the TLO.

Discussion Questions

The Discussion Questions are designed to guide students into a topic or to enhance their understanding of a topic. Instructors may add to or adjust the questions to suit their students.

Application

The Application segment documents experiences that enable students to apply lecture content through cognitive and psychomotor activities, skills exercises, and formative testing. Application experiences included in the course plan are required. Instructors may add additional application experiences to suit their student population if time permits.

Instructor Notes

The Instructor Notes segment documents suggestions and resources to enhance an instructor's ability to teach a specific topic.

CTS Guide Reference

The CTS Guide Reference segment documents the standard(s) from the corresponding Certification Training Standard Guide upon which each topic within the course is based. This segment is eliminated if the course is not based on a standard.

Skill Sheet

The Skill Sheet segment documents the skill sheet that tests the content contained within the topic. This segment is eliminated if the course does not have skill sheets.