

Cuyamaca College

Ford ASSET Course Order and Pathway to Graduation and or Ford Certification

Course Map

1.1

The curricula will include synchronous and asynchronous lectures, laboratory assignments – performance projects, Ford e-learning modules, Ford webinars, objective tests on campus, and required work experience at a Ford dealership. Live lectures occur daily on campus during the normal ASSET face to face class hours using [CCC.ConferZoom](#). Attendance during lectures is required as part of the class participation grade. The lectures start at Noon and last one to two hours. The lectures are recorded, so students who are not able to attend the face to face class may listen to the lecture at different time. [Lectures will be captioned by student request](#). Students must contribute communication during a live lecture. Students may also use the discussion board to listen to recorded lectures and answer the questions posted about the lecture content. [California Education Code Title 5](#) requires student teacher interaction, and students participating in the course must achieve the required lecture and lab contact hours. Students have varied communication resources including phone, smart device, discussion board, webinars, and a private Face Book page.

1.2

Students will use a college learning management system which contains learning activities. The discussion board allows students to post their student performance projects, demonstrating their knowledge and skills throughout the eight week semesters and program. Students must have access to the learning management system by a computer device. Students are required to complete Ford e-learning modules, learning activities, Ford webinars, and laboratory assignments by a specific day and time during each semester. Student who do not complete the learning activities will not be allowed to schedule objective labs and tests.

1.3

The laboratory assignments will be required to be performed by each student. All students are required to perform documented laboratory hours performing prescribed learning objective tasks. The tasks can be performed at the laboratory on campus during laboratory hours, and performance projects documented at the dealership.

1.4

All students are required to visit campus for the objective laboratory assignments and tests during midterms and final examinations. An objective test and laboratory is proctored and evaluates each student's ability to perform the skills required for certification. Each class contains a Ford descriptor correlating to specific corporate training class. Each semester length class includes an average of three Ford descriptors. Each descriptor requires approximately 8 hours of examination.

1.5

The class offerings will occur sequentially throughout each semester. However, with the proposed class divisions it will be possible to offer prerequisite classes; electrical and electronics, or classes identified by Ford student requests at various times throughout the schedule. This will allow more student access to the program.

1.6

Each student is required to have a [“College Education Plan”](#). The education plan requires [students to apply and enroll in the College](#), and an assessment of math and English skills. The education plan will include a defined pathway of general education classes. Cuyamaca College will offer distance learning general education classes to compliment Ford curriculum. A student may elect to take general education classes near their respective dealership. [Students taking classes at a college other than Cuyamaca must articulate classes transferable to a California University](#).

2.0 (Note the current class is proposed to be divided into 3 classes. Climate control will be moved to semester 6 with Inspector Level II Training)

Semester 1 Fall 2017 August 21rst

2.1 Section 1 Class 1 Auto 190 ASSET Orientation, PDI and Lubrication

1-hour lecture, 3 hours' laboratory, 2 units
<i>Total contact hours: 16-17.5 lecture, 48-52.5 laboratory</i>

2.2 Learning Objectives:

- 1) Demonstrate standardized safety and hazardous waste handling practices.
- 2) Describe the work flow processes utilized by new car dealership service departments.
- 3) Prepare new vehicles for customer delivery.
- 4) Perform lubrication maintenance service and minor maintenance services.
- 5) Utilize factory service information from manufacturer's website to accurately service customer vehicles.

2.3 Assigned Web Based Learning Modules:

Lincoln Electronic Pre Delivery Inspection	60S03W0
Lincoln Pre Delivery Inspection - Paper based checklist	60S01W0
Quick Lane: VCU (Vehicle Check Up) Basics	3475W2
Quick Lane: Brand and Values	3651W
Quick Lane: Introduction to Services	3652W
Tire Inspection and Tire Damages	166
People Skills: I Can't See You - Effective Electronic Communication	3575W
Tire Essentials 101 Tire Definitions and Sizing	260
Tire Essentials 102 - Sidewall Markings	261
General Maintenance	10M01W1

PRE DELIVERY INSPECTION	30G22W0
Completing an Efficient VCU/MPI Inspection	10M02W0
ON-LINE SERVICE PUBLICATION NAVIGATION	30G14W1
SYNC Product Knowledge	3610W3
WARRANTY FOR TECHS	30G09W1
Automotive Measuring Tools	32S02W0

2.4 Assigned Laboratory Projects:

Perform various vehicle inspections according to the workshop manual.
 Perform a basic maintenance service as prescribed by the workshop manual.

2.5 Section 2 Class 1 Auto 196 ASSET Electrical, Accessories, and Air Conditioning

4 hours' lecture, 3 hours' laboratory, 5 units
<i>Total contact hours: 64-70 lecture, 48-52.5 laboratory</i>

2.6 Learning Objectives:

- 1) Demonstrate standardized safety and hazardous waste handling practices.
- 2) Perform accurate diagnosis and repairs of electrical and accessory systems.
- 3) Utilize manufacturer's repair information and technical service bulletins for accurate diagnosis and repair.

2.7 Ford Training Course Descriptor

34S14T1 Electrical Diagnosis and Repair
 34S19T2 Electronics Diagnosis and Repair
 35S05T1 Advanced Climate Control Systems Diagnosis

2.8 Assigned Web Based Learning Modules:

2.9 Auto Electrical Diagnosis and Repair

Basic Electrical Theory and Operation	34S11W0
Battery Starting & Charging System Theory & Op	34S12W0
Electrical Diagnosis Tools and Testing I	34S13W0
Electrical Diagnosis Tools and Testing II	34S14W0
IDS - DTC's, PID's, DMM	30G11W1

Understanding Electronic Systems	34S16W0
Network Communication	34S27W0
IDS - O'scope, SGM, & PMI	34S28W0
Hybrid Vehicle Components and Operation	30N26W2
2012 FOCUS ELECTRIC COMPONENTS AND OPERATION	30N41W0

2.10 Auto Electronics Diagnosis and Repair

Anti-Theft Systems	34S21W1
SYNC MyFord Operation and Testing	34S26W3
Hybrid Vehicle Components and Operation	30N26W2
Supplemental Restraints Systems	34S30W0
Instrument Cluster and Lighting Systems	34S31W0
Power Opening Systems	34S32W0
Information and Entertainment Systems	34S33W0
Collision Avoidance and Driver Support	34S34W1
Advanced Module and Network Diagnosis	39S01W0

2.11 Advanced Climate Control Systems Diagnosis

Climate Control Theory and Operation	35S01W1
Electronic Climate Control Theory and Operation	35S03W0
Climate Control System Diagnosis	35S04W1

2.12 Assigned Laboratory Projects: Laboratory assignments can be performed in the traditional lab during the normal face to face class. Or the student can elect to perform a series of assigned projects demonstrating proficiency in a content area at the sponsoring dealership.

Examples:

Perform electrical diagnosis and repair of basic electrical systems i.e.: battery diagnosis and replacement, charging system, lights, and wiring repairs.

Perform electronic systems repairs i.e.: replace electronic control modules, demonstrate the ability to use WSM and IDS to perform correct pin point tests.

Perform climate control system service and diagnosis.

2.13 Objective Tests and Laboratory Performance Testing:

Students will need to schedule approximately 8 hours of testing in the lab for each Ford course descriptor. The student needs to pass each written exam by at least 80%. The student will be given a series of objective laboratory hands on tests which need to be passed by 80%. Students may schedule a second chance written test or lab.

2.14 Auto 197 Work Experience Class

3 Units is 225 hours of paid work experience. Reference the "Tasks" in the Student Record Book.

Semester 2 Spring 2018 January 25th

3.1 Class 2 Section 1 Auto 191 ASSET Brakes and Alignment

5 hours' lecture, 6 hours' laboratory, 7 units
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<i>Total contact hours: 80-87.5 lecture, 96-105 laboratory</i>
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3.2 Learning Objectives:

Upon successful completion of this course, students will be able to:

- 1) Demonstrate standardized safety and hazardous waste handling practices.
- 2) Apply brake system theory principles in order to diagnose brake system and related problems using assigned lab sheets and hands-on testing.
- 3) Perform various brake repairs to prescribed industry standards using assigned lab sheets and hands-on testing.

3.3 Ford Training Course Descriptor

38S07T1 Brake System Diagnosis and Repair
38S08T1 Advanced Brake Diagnosis and Service
33S15T0 Steering and Suspension System
30S06T0 Noise Vibration and Harshness

3.4 Assigned Web Based Training Modules

3.5 Brake System Diagnosis and Repair

Vehicle Brake Systems - Web Based Training	38S01W0
Brake Service Procedures - Web Based Training	38S02W0

3.6 Advanced Brake Diagnosis and Service

Advanced Brake System Theory and Operation	38S03W1
Advanced Brake Systems Diagnosis	38S04W1

3.7 Steering and Suspension System

Suspension Systems Theory and Operation	33S11W1
Steering System Theory and Operation	33S12W2
Steering & Suspension Alignment	33S13W0
Steering and Suspension Systems Tools and Testing	33S14W1
Tire Pressure Monitor Systems (TPMS)	33S16W0

3.8 Noise Vibration and Harshness

Introduction to Noise, Vibration and Harshness	30S05W0
Introduction to MTS4000 Vibration Analyzer	30G13W0

3.9 Assigned Laboratory Projects: Laboratory assignments can be performed in the traditional lab during the normal face to face class. Or the student can elect to perform a series of assigned projects demonstrating proficiency in a content area at the sponsoring dealership.

Examples:

Perform various brake diagnosis and repair including front and rear brake component repair and replacement of parts: Pro Cut on the car brake rotor resurfacing, wheel bearings, hydraulic brake system repair and diagnosis, and vehicle suspension component diagnosis relating to brake system pull, vibration, describing the relationship of brakes and suspension.

Perform anti-lock brake system diagnosis and repair.

Perform suspension diagnosis and repair. Demonstrate ability to perform alignments and adjustments to front and rear steering components. Describe suspension and steering components on various designs.

Demonstrate the ability to use the MTS 4000 Noise Vibration and Harshness diagnostic equipment.

3.10 Objective Tests and Laboratory Performance Testing:

Students will need to schedule approximately 8 hours of testing in the lab for each Ford course descriptor. The student needs to pass each written exam by at least 80%. The student will be given a series of objective laboratory hands on tests which need to be passed by 80%. Students may schedule a second chance written test or lab with the permission of the instructor and service manager.

3.11 Auto 197 Work Experience Class

3 Units is 225 hours of paid work experience. Reference the "Tasks" in the Student Record Book.

Semester 3 Summer 2018 June 11th

4.1 Class 3 Auto 193 ASSET Engine Repair

3 hours' lecture, 4.5 hours' laboratory, 4.5 units

Total contact hours: 48-52.5 lecture, 72-78.75 laboratory

4.2 Learning Objectives

Upon successful completion of this course, students will be able to:

- 1) Demonstrate standardized safety and hazardous waste handling procedures.
- 2) Utilize manufacturer's repair data and specifications for accurate diagnosis and repair using assigned lab sheets and hands-on testing.
- 3) Perform intrusive and non-intrusive engine tests, interpret results, and prescribe appropriate repair using assigned lab sheets and hands-on testing.

4.3 Ford Training Course Descriptor

51S15T0 Diesel Engine Performance and Diagnosis

32S09T0 Engine Diagnosis and Repair

4.4 Assigned Web Based Training Modules

4.5 Engine Repair and Diagnosis

Engine Operation Diagnosis & Repair 1	32S06W0
Engine Operation Diagnosis & Repair 2	32S07W0
Diesel Engine Repair Update	52S-UPDATE
Diesel Engine Repair	52S01W0

4.6 Diesel Engine Performance and Diagnosis

Diesel Engine Theory and Operation	51S03W2
Diesel Fuel Supply and Fuel Injection Systems	51S04W2
Diesel Air Inlet and Exhaust After-treatment	51S05W2
6.0L Diesel Diagnosis	51S07W1

6.4L Diesel Diagnosis	51S10W1
Diesel Diagnosis	51S14W0

4.7 Assigned Laboratory Projects: Laboratory assignments can be performed in the traditional lab during the normal face to face class. Or the student can elect to perform a series of assigned projects demonstrating proficiency in a content area at the sponsoring dealership.

Examples:

Perform engine measurements of engine components as prescribed in the Work Shop Manual. Disassemble and reassemble various 4 stroke engine designs. Demonstrate the ability to use special tools to align timing chains correlation of camshaft and crankshafts. Demonstrate proper cleaning, and torquing of engine components.

Demonstrate the ability to perform in vehicle diagnosis of base engine performance problems: vacuum tests, compression tests, PCV tests, and IDS power balance tests and relative compression tests.

Describe diesel and gasoline engine designs and the different methods and procedures used for various engine designs.

4.8 Objective Tests and Laboratory Performance Testing:

Students will need to schedule approximately 8 hours of testing in the lab for each Ford course descriptor. The student needs to pass each written exam by at least 80%. The student will be given a series of objective laboratory hands on tests which need to be passed by 80%. Students may schedule a second chance written test or lab with the permission of the instructor and service manager.

4.9 Auto 197 Work Experience Class

3 Units is 225 hours of paid work experience. Reference the "Tasks" in the Student Record Book.

Semester 4 Fall 2018 August 21rst

5.1 Auto 192 ASSET Drive Train

5.5 hours' lecture, 7.5 hours' laboratory, 8 units
Total contact hours: 88-96.25 lecture, 120-131.25 laboratory

5.3 Learning Objectives:

Upon successful completion of this course, students will be able to:
 1) Demonstrate standardized safety and hazardous waste handling practices.

- 2) Utilize manufacturer's repair data and specifications for accurate diagnosis and repair using assigned lab sheets and hands-on testing.
- 3) Diagnose manual and automatic transmission mechanical and electrical faults following manufacturer's procedures using assigned lab sheets and hands-on testing.

5.4 Ford Training Course Descriptor

36S17T1 Differential and 4WD Diagnosis and Service

37S13T1 Automatic Transmission Service

37S15T1 Automatic Transmission Diagnosis

5.5 Assigned Web Based Training Modules

5.6 Differential and 4WD Diagnosis and Service

Differential and Driveline Systems Operation	36S13W0
Transfer Case & RWD based 4WD Systems Operation	36S14W0
Transfer Case & RWD based 4WD Systems Diagnosis	36S15W0
FWD based AWD Systems Diagnosis and Service	36S16W1
Manual Transmission and Transaxle Operation	36S10W0
Manual Transmission and Transaxle Diagnosis	36S11W0

5.7 Automatic Transmission Service

Intro to Auto Trans Theory and Operation	37S10W0
Automatic Transmission Electronic Control Systems	37S11W0
Introduction to Automatic Transmission Service	37S12W1
Automatic Transmission Overhaul	37S13W0

5.8 Automatic Transmission Diagnosis

Automatic Transmission Diagnosis	37S14W1
5R110 (Torq-shift) Diagnosis & Service	37S19W0
Torqshift 6 Diagnosis & Service	37S20W1
6F50 Diagnosis & Service	37S21W0
6F35 Diagnosis & Service	37S22W0
DPS6 Operation and Service	37S23W1

5.9 Assigned Laboratory Projects: Laboratory assignments can be performed in the traditional lab during the normal face to face class. Or the student can elect to perform a series of assigned projects demonstrating proficiency in a content area at the sponsoring dealership.

Examples:

Perform various diagnosis and repair of automatic and manual transmission components. Remove, disassemble, identify defective components, identify root cause of failure, and reassemble, perform drive cycle tests, and complete a transmission repair. The projects should include at least front wheel drive, and rear wheel drive transmission diagnosis and repair.

Perform a line pressure test.

Perform a shutter test.

Perform a shift point test.

Diagnose a transmission check engine light concern use IDS and a pin point test procedure.

Demonstrate the ability to perform differential diagnosis and repair.

Perform drive line measurements.

Perform fluid flush procedures after a repair has been performed.

5.10 Objective Tests and Laboratory Performance Testing:

Students will need to schedule approximately 8 hours of testing in the lab for each Ford course descriptor. The student needs to pass each written exam by at least 80%. The student will be given a series of objective laboratory hands on tests which need to be passed by 80%. Students may schedule a second chance written test or lab with the permission of the instructor and service manager.

5.11 Auto 197 Work Experience Class

3 Units is 225 hours of paid work experience. Reference the "Tasks" in the Student Record Book.

Semester 5 Spring 2019 January 28th

6.1 Auto 195 ASSET Electronic Engine Controls

5 hours' lecture, 6 hours' laboratory, 7 units

Total contact hours: 80-87.5 lecture, 96-105 laboratory

6.2 Learning Objectives:

Upon successful completion of this course, students will be able to:

- 1) Demonstrate standardized safety and hazardous waste handling practices.
- 2) Relate theory of gasoline and diesel engine systems to practical diagnostic application using assigned lab sheets and hands-on testing.
- 3) Independently perform tune-up and repair operations using diagnostic equipment using assigned lab sheets and hands-on testing.
- 4) Independently perform electronic engine diagnostics on both gasoline and diesel vehicles using assigned lab sheets and hands-on testing.

6.3 Ford Training Course Descriptor

31S26T0 Engine Performance Operation and Diagnosis

31S28T0 Advanced Engine Performance Diagnosis and Testing

31S30T0 Gas Turbo Direct Injection Diagnosis and Testing

6.4 Assigned Web Based Training Modules

6.5 Engine Performance Operation and Diagnosis

Introduction to Engine Performance	31S20W0
Fuel and Air Theory and Operation	31S21W0
Exhaust and Emissions Theory and Operation	31S23W0
Ignition Theory and Operation	31S22W0

6.6 Advanced Engine Performance Diagnosis and Testing

EP System Relationships and OBD II Monitors	31S24W0
EP Diagnostic Processes and Routines 1	31S25W0
EP Diagnostic Processes and Routines 2	31S27W0

6.7 Gas Turbo Direct Injection Diagnosis and Testing

Gasoline Turbocharged Direct Injection (Ecoboost)	31S29W2
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6.8 Assigned Laboratory Projects: Laboratory assignments can be performed in the traditional lab during the normal face to face class. Or the student can elect to perform a series of assigned projects demonstrating proficiency in a content area at the sponsoring dealership.

Examples:

Diagnose and repair an evaporative control system. Describe each evaporative system component and the ability to active and test each component demonstrating knowledge of the cause and effect each component has on the system. Complete a drive cycle test to verify and evaporative system repair.

Diagnose and exhaust gas recirculation system concern on diesel or gasoline. Demonstrate knowledge of the cause and effect of EGR concerns on the emissions produced.

Diagnose and repair oxygen sensors and HEGO sensors.

Diagnose and repair various vacuum leaks before and after the throttle plate. Demonstrate knowledge of manifold and mass air flow sensors on various engine designs.

Perform low pressure and high pressure fuel tests and demonstrate knowledge and ability to safely disable and repair high pressure fuel system components.

Perform ignition systems diagnosis and repair. Demonstrate the ability to perform various ignition system tests.

Demonstrate knowledge and ability to diagnose temperature sensors of various designs including wide band temperature sensors.

6.9 Objective Tests and Laboratory Performance Testing:

Students will need to schedule approximately 8 hours of testing in the lab for each Ford course descriptor. The student needs to pass each written exam by at least 80%. The student will be given a series of objective laboratory hands on tests which need to be passed by 80%. Students may schedule a second chance written test or lab with the permission of the instructor and service manager.

6.10 Auto 197 Work Experience Class

3 Units is 225 hours of paid work experience. Reference the "Tasks" in the Student Record Book.

Semester 6 Summer 2019 June 19th

7.1 Auto 142 Emission Control Level II Inspector License

1 hour lecture, 3 hours laboratory, 2 units

Lecture contact hours: 16-18; Homework hours: 32-36; Total student learning hours 48-54

Laboratory contact hours: 48 -54; Homework hours: zero; Total student learning hours 48-54
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7.2 Learning Outcomes:

Upon successful completion of this course, students will be able to:

- 1) Describe and demonstrate personal, shop, equipment, vehicle safety practices, and the cause and effect of harmful pollution resulting from improper functioning emission control devices and systems from vehicles.

- 2) Demonstrate their knowledge, skills and abilities in performing emission tests and inspections on various vehicle designs and systems.
- 3) Describe standards and practice expected of Inspectors applied to federal and state emission laws and regulations.

7.3 Ford Training Course Descriptor – NONE

7.4 Assigned Web Based Training Modules

Smog Check Training Courses

- [BAR-OIS Training](#)
- [Diesel Vehicle Inspection Training](#)
- [Fuel Evaporative System Inspection Training](#)
- [Hybrid Smog Check Inspections](#)
- [Smog Check Inspection Video](#)
- [Smog Check Inspector Update Training](#)
- [Visible Smoke Test Training](#)

California Smog Check Training Series

- [California Smog Check Program - Module 1](#)
- [How to do a California Smog Check Inspection - Module 2](#)
- [Using the ECS Application Guide - Module 3](#)
- [Smog Check Inspection Procedures for OBD II - Module 4](#)
- [Procedures for Ignition Timing Inspections - Module 5](#)
- [Aftermarket Parts - Module 6](#)
- [Inspection Procedures for Engine Changes - Module 7](#)
- [EGR Functional Testing - Module 8](#)
- [Referee Network - Module 9](#)

Other Training Resources

- [2013 Smog Check Manual](#)
- [2014 Smog Check Reference Guide](#)
- [Smog Check OBD Reference](#)
- [California Automotive Resource Center](#)
- [BAR Educational Advisory Group](#)
- [CAP Operations Manual and Training Module](#)
- [Course Descriptions](#)
- [I-CAR Repairability Technical Support Portal](#)
- [Training Course Catalog](#)
- [Write it Right - A Guide For ARDs](#)

7.5 Assigned Laboratory Projects: Laboratory assignments can be performed in the traditional lab during the normal face to face class. Or the student can elect to perform a series of assigned projects demonstrating proficiency in a content area at the sponsoring dealership

Examples:

Perform smog inspections on various engine designs. Identify emission control components on various vehicle designs.

Perform at least 6 complete smog inspections on various vehicle designs.

Perform a visual smoke test, snap throttle test, EVAP system smoke test, and timing functional tests as prescribed by the California Bureau of Automotive Repair.

7.6 Apply for the Inspector and Repair License during the first week of class.

7.7 Objective Tests and Laboratory Performance Testing:

Students will perform at least 6 inspections with no errors in the lab.

7.8 Students will take the BAR Inspector and Repair Tests proctored by PSI.

Graduation and or Ford Certification

8.1 Students who successfully complete Ford objective tests and laboratory assignments will achieve Ford certifications throughout the program. Most students do not pass the electrical and electronic tests during the first semester. However, each Ford class has an electrical and electronic component test which allows students to prove their capabilities during objective labs. Students may also schedule to take a retest if they fail a written test or laboratory test.

Sample Student Projects

See the attached files