

Automotive Mechanics Technology | Cosumnes River College


The Automotive Mechanics Technology program emphasizes developing skills required for efficient diagnosis, maintenance, and repair of the automobile and its components. This program and its instructors are Automotive Service Excellence (ASE) certified. The college offers both theoretical and practical training relating to all phases of the automobile.


[AUTOMOTIVE TECH/ASSET DEPARTMENT \(/ACADEMICS/AUTO-TECH-ASSET\)](#) ▶




DEAN

[Colette Harris-Mathews \(/about-us/contact-us/faculty-and-staff-directory/colette-harris-mathews\)](#)

 Automotive, Construction and Design Technology

 (916) 691-4300

 HarrisC2@crc.losrios.edu
(<mailto:HarrisC2@crc.losrios.edu>)

DEPARTMENT
CHAIR

[Kevin Rogers \(/about-us/contact-us/faculty-and-staff-directory/kevin-rogers\)](#)

Associate Degrees

A.S. in Automotive Mechanics Technology (Ford ASSET)

The Ford Automotive Student Service Education Training (ASSET) Program is a two-year Associate's Degree program in Automotive Mechanics Technology. This program is designed to help students develop the skills necessary to efficiently and accurately maintain, diagnose, and service/repair all major systems of the automobile.

The Ford ASSET Program is a partnership between Cosumnes River College (CRC) and Ford Motor Company. Ford ASSET is the only program that includes an in dealership cooperative work experience component. Students will rotate between school and the dealership for the duration of the two-year program, giving them invaluable hands-on experience while they learn.

Courses within the Ford ASSET program allow students to earn Service Technician Specialty Training (STST) certifications from Ford Motor Company in the following areas:

- Electrical Systems
- Brake Systems
- Steering & Suspension
- Climate Control
- Automatic Transmissions
- Gasoline Engine Repair
- Gasoline Engine Performance
- Diesel Engine Repair
- Diesel Engine Performance
- Manual Transmissions

Instructors for this program are Ford STST certified as required by Ford Motor Company standards.

Completion of this degree also represents completion of a National Automotive Technicians Education Foundation (NATEF) accredited Master Automotive Service Technology (MAST) program. Instructors for this program are Automotive Service Excellence (ASE) certified as required by NATEF standards.

Upon successful completion of this program, students are well qualified for placement as service technicians in Ford and/or Lincoln dealerships. Students may apply units earned by the successful completion of this program to one or more of the specialized certificates as well as the Associate's degree.

Catalog Date: June 1, 2019

Degree Requirements

COURSE CODE	COURSE TITLE	UNITS
First Year - Fall Semester:		
AMT 370	Ford ASSET Automotive Fundamentals and Dealership Practices	4
AMT 371	Ford ASSET Automotive Electrical/Electronic Systems	3
AMT 372	Ford ASSET Automotive Brake Systems	3
A minimum of 3 units from the following:		3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
First Year - Spring Semester:		
AMT 374	Ford ASSET Automotive Suspension and Steering	3
AMT 375	Ford ASSET Automotive Wheel Alignment	3

COURSE CODE	COURSE TITLE	UNITS
AMT 376	Ford ASSET Automotive Heating and Air Conditioning	3
A minimum of 3 units from the following:		3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
First Year - Summer Semester:		
AMT 378	Ford ASSET Automatic Transmissions/Transaxles	3
AMT 130	Ford ASSET Advanced Automatic Transmission Diagnosis	1.5
AMT 379	Ford ASSET Automotive Engine Repair	3
AMT 385	Ford ASSET Automotive Manual Drive Train and Axles	1.5
Second Year - Fall Semester:		
AMT 381	Ford ASSET Electronic Engine Control	4
AMT 382	Ford ASSET Gasoline Engine Performance	3
AMT 383	Ford ASSET Advanced Gasoline Engine Performance	3
A minimum of 3 units from the following:		3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
Second Year - Spring Semester:		
AMT 131	Ford ASSET Diesel Engine Performance	3
AMT 340	Emission Control Inspection and Repair	5
WELD 160	Welding Technology for the Automotive Industry	1.5
A minimum of 3 units from the following:		3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
Total Units:		59.5

The Automotive Mechanics Technology (Ford ASSET) Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

- Eligibility for ENGWR 101.
- Eligibility for MATH 100.
- Possess a valid driver's license with a driving record that is suitable for the sponsoring dealership's insurance requirements.
- Able to operate a vehicle equipped with a manual transmission.
- Meet sponsoring dealership hiring requirements which may include submitting to a drug test and/or criminal background check.
- Completion of an application for the Ford ASSET Program (can be found at <http://www.crc.losrios.edu/cars>).

Enrollment Process

Eligible students are selected for the program according to the following steps:

- Students are selected from the applicant pool in the order in which they are received.
- Only students who meet the stated eligibility requirements will be considered for the program.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO 1: Understand the fundamental purpose, components, and operation of major automotive systems to include gasoline engines, automatic transmissions and transaxles, manual transmissions, drivetrains, and axles, suspension and steering systems, brake systems, electrical and electronic systems, heating and air conditioning systems, and engine performance systems.
- PSLO 2: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical new car dealership hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- PSLO 3: Diagnose engine mechanical concerns, conduct diagnostic testing procedures, and perform the procedures and techniques involved in typical engine repairs and overhauls.
- PSLO 4: Demonstrate the ability to diagnose, service, and repair automatic transmissions and transaxles.
- PSLO 5: Demonstrate the ability to diagnose and repair manual transmissions, transaxles, and drive train concerns.
- PSLO 6: Demonstrate the ability to diagnose and repair automotive suspension and steering concerns.
- PSLO 7: Demonstrate the ability to diagnose and repair automotive brake systems.
- PSLO 8: Demonstrate the ability to diagnose and repair automotive electrical and electronic concerns.
- PSLO 9: Demonstrate the ability to diagnose and repair automotive heating, ventilation, and air conditioning (HVAC) system concerns.
- PSLO 10: Demonstrate the ability to diagnose, service, and repair gasoline engine performance systems and their components.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

- Automotive Technician
- Light Duty Diesel Technician
- Ford/Lincoln Specialized Technician (in any of the Service Technician Specialty Training [STST] areas)
- Ford/Lincoln Engine Master Technician
- Ford/Lincoln Chassis Master Technician
- Ford/Lincoln Drivetrain Master Technician
- Ford/Lincoln Senior Master Technician

Students who successfully complete the program will:

- Earn an Associate's degree in Automotive Mechanics Technology.
- Be granted Ford Service Technician Specialty Training (STST) credentials.
- Be prepared for Automotive Service Excellence (ASE) certification in all Automobile series areas.
- Be eligible to sit for testing for both the California SMOG Inspector and SMOG Repair licenses.

A.S. in Automotive Mechanics Technology

This program emphasizes developing skills required for efficient diagnosis, maintenance, and repair of the automobile and its components. Completion of this degree also represents completion of a National Automotive Technicians Education Foundation (NATEF) accredited Master Automotive Service Technology (MAST) program. Instructors for this program are Automotive Service Excellence (ASE) certified as required by NATEF standards.

Upon successful completion of the program, students are qualified for placement as technicians in the automotive industry. Students may apply units earned by successful completion of Automotive Mechanics Technology courses to one or more of the specialized certificates and/or the Associate Degree in Automotive Mechanics Technology.

HIGHLIGHTS

- *One of the best equipped shops in Northern California for hands-on training
- *Graduates routinely pass ASE and State Smog Certification exams
- *A facility chosen as part of the GM, Ford and Chrysler Technical Training Network
- *NATEF MAST program
- *ASE Certified instructors
- *Class sizes with an excellent teacher/student ratio

Catalog Date: June 1, 2019

Degree Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 300	Automotive Fundamentals and Shop Procedures	4
AMT 303	Automotive Electrical & Electronic Systems	4
AMT 304	Automotive Manual Drive Train and Axles	3
AMT 310	Engine Performance	3
AMT 314	Wheel Alignment	3
AMT 316	Automotive Brakes	3
AMT 322	Engine Repair	3
AMT 324	Electronic Fuel Injection	3
AMT 326	Automotive Heating and Air Conditioning	3
AMT 330	Automatic Transmissions/Transaxles	3
AMT 332	Automotive Computerized Controls	3
A minimum of 5 units from the following:		5
AMT 140	Automotive Service (1)	

COURSE CODE	COURSE TITLE	UNITS
AMT 301	Automotive Service Management (3)	
AMT 305	Survey of Alternative Fueled & Hybrid Vehicles (3)	
AMT 306	Small Engine Repair (3)	
AMT 308	Late Model Car Care and Maintenance (3)	
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
A minimum of 3 units from the following:		3
AMT 321	Advanced Automotive Electrical & Hybrid Vehicle Systems (3)	
AMT 328	Light Duty Diesel Engine Performance (3)	
AMT 336	Advanced Service Management (3)	
AMT 340	Emission Control Inspection and Repair (5)	
Total Units:		43

The Automotive Mechanics Technology Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO 1: Understand the fundamental purpose, components, and operation of major automotive systems to include gasoline engines, automatic transmissions and transaxles, manual transmissions, drivetrains, and axles, suspension and steering systems, brake systems, electrical and electronic systems, heating and air conditioning systems, and engine performance systems.
- PSLO 2: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical automotive shop hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- PSLO 3: Diagnose engine mechanical concerns, conduct diagnostic testing procedures, and perform the procedures and techniques involved in typical engine repairs and overhauls.
- PSLO 4: Demonstrate the ability to diagnose, service, and repair automatic transmissions and transaxles.
- PSLO 5: Demonstrate the ability to diagnose and repair manual transmissions, transaxles, and drive train concerns.
- PSLO 6: Demonstrate the ability to diagnose and repair automotive suspension and steering concerns.
- PSLO 7: Demonstrate the ability to diagnose and repair automotive brake systems.
- PSLO 8: Demonstrate the ability to diagnose and repair automotive electrical and electronic concerns.
- PSLO 9: Demonstrate the ability to diagnose and repair automotive heating, ventilation, and air conditioning (HVAC) system concerns.
- PSLO 10: Demonstrate the ability to diagnose, service, and repair gasoline engine performance systems and their components.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

Auto Technician; Auto/Truck Specialist; Automotive Microcomputer Programmer & Operator; Field Service/Sales Representative; Inventory Controls Manager; Tune-up & Electrical Specialist.

ASE certified in the areas of Brakes, Electrical/Electronic Systems, Engine Performance, Suspension and Steering, Automatic Transmission/Transaxle, Engine Repair, Heating and Air Conditioning, and Manual Drive Train and Axles.

Courses in the general automotive program are designed to emphasize skills development in efficient diagnosis, maintenance, and repair of the automobile. A wide variety of makes and models of vehicles are used in laboratory practice. Students can enter the General Program in Automotive Mechanics Technology at any semester, summer, fall, or spring. Certificate programs as well as an A.S. degree in Automotive Mechanics Technology are available.

Certificates of Achievement

Automatic Transmissions and Transaxles Certificate

The curriculum is designed for students interested in seeking employment in the diagnosis and repair of automatic transmissions/transaxles.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 300	Automotive Fundamentals and Shop Procedures	4
AMT 303	Automotive Electrical & Electronic Systems	4
AMT 304	Automotive Manual Drive Train and Axles	3
AMT 330	Automatic Transmissions/Transaxles	3
Total Units:		14

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- Identify components and systems that require periodic inspection and/or maintenance.
- Explain the proper use of service publications used in diagnostic procedures.
- Recognize electronic principles and how they relate to particular automotive systems.
- Perform the necessary repair procedure for a certain set electrical/electronic diagnostic problems.
- Understand the operation of clutches, manual transmissions, transaxles, transfer cases, drive shafts, and axle assemblies (powertrain).
- Demonstrate the ability to diagnose manual powertrain concerns.
- Understand theory and operation of automatic transmissions/transaxles.
- Demonstrate the ability to repair automatic transmissions/transaxles.

Automatic Transmissions/Transaxles (Ford ASSET) Certificate

This certificate represents a subset of the Ford Automotive Student Service Education Training (ASSET) Program and is intended for students wishing to specialize in automatic transmissions and transaxles. This certificate is designed to help students develop the skills necessary to efficiently and accurately maintain, diagnose, and service/repair automatic transmissions and transaxles.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 370	Ford ASSET Automotive Fundamentals and Dealership Practices	4
AMT 371	Ford ASSET Automotive Electrical/Electronic Systems	3
AMT 378	Ford ASSET Automatic Transmissions/Transaxles	3
AMT 130	Ford ASSET Advanced Automatic Transmission Diagnosis	1.5
A minimum of 3 units from the following:		3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
Total Units:		14.5

Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

- Eligibility for ENGWR 101.
- Eligibility for MATH 100.
- Possess a valid driver's license with a driving record that is suitable for the sponsoring dealership's insurance requirements.
- Able to operate a vehicle equipped with a manual transmission.
- Meet sponsoring dealership hiring requirements which may include submitting to a drug test and/or criminal background check.
- Completion of an application for the Ford ASSET Program (can be found at <http://www.crc.losrios.edu/cars>).

Enrollment Process

Eligible students are selected for the program according to the following steps:

- Students are selected from the applicant pool in the order in which they are received.
- Only students who meet the stated eligibility requirements will be considered for the program.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO 1: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical new car dealership hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.

- SLO 2: Understand the fundamental purpose, components, and operation of automatic transmissions and transaxles.
- SLO 3: Demonstrate the ability to diagnose, service, and repair automatic transmissions and transaxles.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

Automotive Maintenance / Light Repair Technician Automatic Transmission Technician Ford/Lincoln Specialized Technician (in Service Technician Specialty Training [STST] area 37-Automatic Transmissions)

Automotive Brakes (Ford ASSET) Certificate

This certificate represents a subset of the Ford Automotive Student Service Education Training (ASSET) Program and is intended for students wishing to specialize in automotive brake systems. This certificate is designed to help students develop the skills necessary to efficiently and accurately maintain, diagnose, and service/repair automotive brake systems.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 370	Ford ASSET Automotive Fundamentals and Dealership Practices	4
AMT 371	Ford ASSET Automotive Electrical/Electronic Systems	3
AMT 372	Ford ASSET Automotive Brake Systems	3
A minimum of 3 units from the following:		3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
Total Units:		13

Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

- Eligibility for ENGWR 101.
- Eligibility for MATH 100.
- Possess a valid driver's license with a driving record that is suitable for the sponsoring dealership's insurance requirements.
- Able to operate a vehicle equipped with a manual transmission.
- Meet sponsoring dealership hiring requirements which may include submitting to a drug test and/or criminal background check.
- Completion of an application for the Ford ASSET Program (can be found at <http://www.crc.losrios.edu/cars>).

Enrollment Process

Eligible students are selected for the program according to the following steps:

- Students are selected from the applicant pool in the order in which they are received.
- Only students who meet the stated eligibility requirements will be considered for the program.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO 1: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical new car dealership hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- SLO 2: Understand the fundamental purpose, components, and operation of automotive brake systems.
- SLO 3: Demonstrate the ability to diagnose and repair automotive brake systems.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

Automotive Maintenance / Light Repair Technician Brake System Technician Ford/Lincoln Specialized Technician (in Service Technician Specialty Training [STST] area 38-Brakes)

Automotive Brakes Certificate

This curriculum is designed for students interested in seeking employment in the repair and installation of automotive brakes systems.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 300	Automotive Fundamentals and Shop Procedures	4
AMT 303	Automotive Electrical & Electronic Systems	4
AMT 310	Engine Performance	3
AMT 316	Automotive Brakes	3
AMT 332	Automotive Computerized Controls	3
Total Units:		17

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- Describe the fundamentals of automotive systems to include engine operation and repair, automatic transmissions/transaxles, manual drive train and axles, suspension and steering, brakes, electrical and electronic systems, heating and air conditioning, and engine performance.
- Describe the fundamentals of diagnosing automotive systems.
- Explain how to perform fundamental diagnostic procedures as outlined in manufacture service publications.
- Describe the theory and operation of Automotive Electrical/Electronic Systems.
- Recall and apply step-by-step diagnostic procedures.

- Repair automotive electrical/electronic systems relating to Brake Systems.
- Understand theory and operation of automotive brake systems.
- Explain the operation of conventional, anti-lock, traction control and electronic stability assist brake systems.
- Demonstrate the ability to repair automotive brake systems.
- Explain theory and operations of automotive computerized controls.
- Perform inspection, testing, disassembly, component replacement, reassembly, and confirmation of repair on automotive computerized control systems.

Automotive Electrical Systems (Ford ASSET) Certificate

This certificate represents a subset of the Ford Automotive Student Service Education Training (ASSET) Program and is intended for students wishing to specialize in automotive electrical systems. This certificate is designed to help students develop the skills necessary to efficiently and accurately maintain, diagnose, and service/repair automotive electrical systems.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 370	Ford ASSET Automotive Fundamentals and Dealership Practices	4
AMT 371	Ford ASSET Automotive Electrical/Electronic Systems	3
AMT 381	Ford ASSET Electronic Engine Control	4
A minimum of 3 units from the following:		3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
Total Units:		14

Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

- Eligibility for ENGWR 101.
- Eligibility for MATH 100.
- Possess a valid driver's license with a driving record that is suitable for the sponsoring dealership's insurance requirements.
- Able to operate a vehicle equipped with a manual transmission.
- Meet sponsoring dealership hiring requirements which may include submitting to a drug test and/or criminal background check.
- Completion of an application for the Ford ASSET Program (can be found at <http://www.crc.losrios.edu/cars>).

Enrollment Process

Eligible students are selected for the program according to the following steps:

- Students are selected from the applicant pool in the order in which they are received.
- Only students who meet the stated eligibility requirements will be considered for the program.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO 1: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical new car dealership hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- SLO 2: Understand the fundamental purpose, components, and operation of automotive electrical and electronic systems.
- SLO 3: Demonstrate the ability to diagnose, service, and repair automotive electrical and electronic systems.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

Automotive Technician (Electrical Specialist) Ford/Lincoln Specialized Technician (in Service Technician Specialty Training [STST] area 34-Electrical Systems)

Automotive Electrical Systems Certificate

This curriculum is designed for students interested in seeking employment in the diagnosis and repair of automotive electrical systems.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 300	Automotive Fundamentals and Shop Procedures	4
AMT 303	Automotive Electrical & Electronic Systems	4
AMT 310	Engine Performance	3
AMT 321	Advanced Automotive Electrical & Hybrid Vehicle Systems	3
AMT 332	Automotive Computerized Controls	3
Total Units:		17

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- Describe the fundamentals of automotive systems to include engine operation and repair, automatic transmissions/transaxles, manual drive train and axles, suspension and steering, brakes, electrical and electronic systems, heating and air conditioning, and engine performance.
- Explain how to perform fundamental diagnostic procedures as outlined in manufacture service publications.

- Describe the theory and operation of Automotive Electrical/Electronic Systems.
- Perform the necessary repair procedure for a certain set electrical/electronic diagnostic problems.
- Describe the theory and the operation of automotive ignition systems.
- Apply test procedures on automotive ignition systems and components
- Describe the theory and operation of Electronic Control Systems.
- Diagnose automotive electronic control system concerns.
- Explain the relationships between input sensors, processing and output sensors.
- Perform the necessary repair procedures for a certain set of automotive computerized control diagnostic problems.

Automotive Emission Control Certificate

This curriculum is designed for students who are interested in seeking employment in the inspection, diagnosis, and/or repair of automotive emission control systems. Students completing this program may be eligible to pursue licensing as a California SMOG Check Inspector and/or California SMOG Check Repair Technician.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 300	Automotive Fundamentals and Shop Procedures	4
AMT 303	Automotive Electrical & Electronic Systems	4
AMT 310	Engine Performance	3
AMT 324	Electronic Fuel Injection	3
AMT 332	Automotive Computerized Controls	3
AMT 340	Emission Control Inspection and Repair	5 ¹
Total Units:		22

¹A current advanced emission control smog license will meet the requirement for AMT 340. ASE (Automotive Service Excellence) Certification in A6, A8, and L1 will meet requirements for AMT 303, 310, 332. No units will be earned for requirements met through licensing or certification exams. In these cases fewer total units are required.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- Recognize electronic principles and how they relate to particular automotive systems.
- Diagnose automotive engine performance concerns.
- Demonstrate the ability to diagnose electronic fuel injection.
- Diagnose automotive computerized control concerns.
- Identify the fundamentals of automotive emission systems to include electrical, vacuum, computerized vehicle emission components, emission regulations, emission testing, emission reduction systems, and emission inspection/diagnostic equipment.

Automotive Engine Performance (Ford ASSET) Certificate

This certificate represents a subset of the Ford Automotive Student Service Education Training (ASSET) Program and is intended for students wishing to specialize in gasoline engine performance systems. This certificate is designed to help students develop the skills necessary to efficiently and accurately maintain, diagnose, and service/repair gasoline engine performance systems.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 371	Ford ASSET Automotive Electrical/Electronic Systems	3
AMT 381	Ford ASSET Electronic Engine Control	4
AMT 382	Ford ASSET Gasoline Engine Performance	3
AMT 383	Ford ASSET Advanced Gasoline Engine Performance	3
Total Units:		13

Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

- Eligibility for ENGWR 101.
- Eligibility for MATH 100.
- Possess a valid driver's license with a driving record that is suitable for the sponsoring dealership's insurance requirements.
- Able to operate a vehicle equipped with a manual transmission.
- Meet sponsoring dealership hiring requirements which may include submitting to a drug test and/or criminal background check.
- Completion of an application for the Ford ASSET Program (can be found at <http://www.crc.losrios.edu/cars>).

Enrollment Process

Eligible students are selected for the program according to the following steps:

- Students are selected from the applicant pool in the order in which they are received.
- Only students who meet the stated eligibility requirements will be considered for the program.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO 1: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Demonstrate the use of special tools necessary to repair gasoline engine performance systems and their components.

- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- SLO 2: Understand the fundamental purpose, components, and operation of gasoline engine performance systems.
- SLO 3: Demonstrate the ability to diagnose, service, and repair gasoline engine performance systems and their components.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

Automotive Technician (Drivability Specialist) Ford/Lincoln Specialized Technician (in Service Technician Specialty Training [STST] area 31-Gasoline Engine Performance)

Automotive Engine Performance Certificate

This curriculum is designed for students who are interested in seeking employment in the inspection, maintenance, diagnosis, and repair of automotive engine performance systems.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 300	Automotive Fundamentals and Shop Procedures	4
AMT 303	Automotive Electrical & Electronic Systems	4
AMT 306	Small Engine Repair (3)	3
or AMT 322	Engine Repair (3)	
AMT 310	Engine Performance	3
AMT 321	Advanced Automotive Electrical & Hybrid Vehicle Systems	3
AMT 324	Electronic Fuel Injection	3
AMT 332	Automotive Computerized Controls (3)	3 - 5
or AMT 340	Emission Control Inspection and Repair (5)	
Total Units:		23 - 25

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- Recognize electronic principles and how they relate to particular automotive systems.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Repair automotive engine performance systems.
- Describe theory and the operation of automotive ignition systems.
- Diagnose automotive electronic control system concerns.
- Diagnose engine mechanical concerns and conduct diagnostic testing procedures.
- Understand theory and operation of electronic fuel injection.

- Perform the necessary repair procedures for a certain set of automotive computerized control diagnostic problems.
- Identify the fundamentals of automotive emission systems to include electrical, vacuum, computerized vehicle emission components, emission regulations, emission testing, emission reduction systems, and emission inspection/diagnostic equipment.

Automotive Engine Repair (Ford ASSET) Certificate

This certificate represents a subset of the Ford Automotive Student Service Education Training (ASSET) Program and is intended for students wishing to specialize in automotive engine repair. This certificate is designed to help students develop the skills necessary to efficiently and accurately maintain, diagnose, and service/repair automotive engines.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 370	Ford ASSET Automotive Fundamentals and Dealership Practices	4
AMT 379	Ford ASSET Automotive Engine Repair	3
AMT 382	Ford ASSET Gasoline Engine Performance	3
A minimum of 3 units from the following:		3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
Total Units:		13

Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

- Eligibility for ENGWR 101.
- Eligibility for MATH 100.
- Possess a valid driver's license with a driving record that is suitable for the sponsoring dealership's insurance requirements.
- Able to operate a vehicle equipped with a manual transmission.
- Meet sponsoring dealership hiring requirements which may include submitting to a drug test and/or criminal background check.
- Completion of an application for the Ford ASSET Program (can be found at <http://www.crc.losrios.edu/cars>).

Enrollment Process

Eligible students are selected for the program according to the following steps:

- Students are selected from the applicant pool in the order in which they are received.
- Only students who meet the stated eligibility requirements will be considered for the program.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO 1: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical new car dealership hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- SLO 2: Understand the fundamental purpose, components, and operation of automotive engines.
- SLO 3: Diagnose engine mechanical concerns, conduct diagnostic testing procedures, and perform the procedures and techniques involved in typical engine repairs and overhauls.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

Automotive Technician (Engine Repair Specialist) Ford/Lincoln Specialized Technician (in Service Technician Specialty Training [STST] area 32-Gasoline Engine Repair)

Automotive Engine Repair Certificate

This curriculum is designed for students interested in seeking employment in the engine overhaul and engine repair field.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 300	Automotive Fundamentals and Shop Procedures	4
AMT 306	Small Engine Repair	3
AMT 322	Engine Repair	3
A minimum of 3 units from the following:		3
Any other Automotive Mechanics Technology course		
Total Units:		13

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO 1: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical automotive repair shop hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- SLO 2: Understand the fundamental purpose, components, and operation of automotive engines.
- SLO 3: Diagnose engine mechanical concerns, conduct diagnostic testing procedures, and perform the procedures and techniques involved in typical engine repairs and overhauls.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Automotive Heating and Air Conditioning (Ford ASSET) Certificate

This certificate represents a subset of the Ford Automotive Student Service Education Training (ASSET) Program and is intended for students wishing to specialize in automotive heating and air conditioning systems. This certificate is designed to help students develop the skills necessary to efficiently and accurately maintain, diagnose, and service/repair automotive heating and air conditioning systems.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 370	Ford ASSET Automotive Fundamentals and Dealership Practices	4
AMT 371	Ford ASSET Automotive Electrical/Electronic Systems	3
AMT 376	Ford ASSET Automotive Heating and Air Conditioning	3
AMT 379	Ford ASSET Automotive Engine Repair	3
Total Units:		13

Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

- Eligibility for ENGWR 101.
- Eligibility for MATH 100.
- Possess a valid driver's license with a driving record that is suitable for the sponsoring dealership's insurance requirements.
- Able to operate a vehicle equipped with a manual transmission.
- Meet sponsoring dealership hiring requirements which may include submitting to a drug test and/or criminal background check.
- Completion of an application for the Ford ASSET Program (can be found at <http://www.crc.losrios.edu/cars>).

Enrollment Process

Eligible students are selected for the program according to the following steps:

- Students are selected from the applicant pool in the order in which they are received.
- Only students who meet the stated eligibility requirements will be considered for the program.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO 1: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical new car dealership hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.

- SLO 2: Understand the fundamental purpose, components, and operation of automotive heating and air conditioning systems.
- SLO 3: Demonstrate the ability to diagnose and repair automotive heating, ventilation, and air conditioning (HVAC) system concerns.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

Automotive Maintenance / Light Repair Technician Automotive HVAC Technician Ford/Lincoln Specialized Technician (in Service Technician Specialty Training [STST] area 35-Climate Control)

Automotive Heating and Air Conditioning Certificate

This curriculum is designed for students interested in seeking employment in the automotive heating and air conditioning repair/installation field.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 300	Automotive Fundamentals and Shop Procedures	4
AMT 303	Automotive Electrical & Electronic Systems	4
AMT 310	Engine Performance	3
AMT 326	Automotive Heating and Air Conditioning	3
AMT 332	Automotive Computerized Controls	3
Total Units:		17

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- Describe the fundamentals of diagnosing automotive systems.
- Explain the proper use of service publications used in diagnostic procedures.
- Recognize electronic principles and how they relate to particular automotive systems.
- Perform the necessary repair procedure for a certain set electrical/electronic diagnostic problems.
- Understand the basic operation of automotive air conditioning (A/C) and engine cooling systems.
- Repair automotive air conditioning (A/C) and cooling systems.

Automotive Mechanics Technology (Ford ASSET) Certificate

The Ford Automotive Student Service Education Training (ASSET) Program is a two-year program in Automotive Mechanics Technology. This program is designed to help students develop the skills necessary to efficiently and accurately maintain, diagnose, and service/repair all major systems of the automobile.

The Ford ASSET Program is a partnership between Cosumnes River College (CRC) and Ford Motor Company. Ford ASSET is the only program that includes an in dealership cooperative work experience component. Students will rotate between school and the dealership for the duration of the two-year program, giving them invaluable hands-on experience while they learn.

Courses within the Ford ASSET program allow students to earn Service Technician Specialty Training (STST) certifications from Ford Motor Company in the following areas:

- Electrical Systems
- Brake Systems
- Steering & Suspension
- Climate Control
- Automatic Transmissions
- Gasoline Engine Repair
- Gasoline Engine Performance
- Diesel Engine Repair
- Diesel Engine Performance
- Manual Transmissions

Instructors for this program are Ford STST certified as required by Ford Motor Company standards.

Completion of this certificate also represents completion of a National Automotive Technicians Education Foundation (NATEF) accredited Master Automotive Service Technology (MAST) program. Instructors for this program are Automotive Service Excellence (ASE) certified as required by NATEF standards.

Upon successful completion of this program, students are well qualified for placement as service technicians in Ford and/or Lincoln dealerships. Students may apply units earned by the successful completion of this program to one or more of the specialized certificates as well as the Associate's degree.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 370	Ford ASSET Automotive Fundamentals and Dealership Practices	4
AMT 371	Ford ASSET Automotive Electrical/Electronic Systems	3
AMT 372	Ford ASSET Automotive Brake Systems	3
A minimum of 3 units from the following:		3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
AMT 374	Ford ASSET Automotive Suspension and Steering	3
AMT 375	Ford ASSET Automotive Wheel Alignment	3
AMT 376	Ford ASSET Automotive Heating and Air Conditioning	3
A minimum of 3 units from the following:		3

COURSE CODE	COURSE TITLE	UNITS
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
AMT 378	Ford ASSET Automatic Transmissions/Transaxles	3
AMT 130	Ford ASSET Advanced Automatic Transmission Diagnosis	1.5
AMT 379	Ford ASSET Automotive Engine Repair	3
AMT 385	Ford ASSET Automotive Manual Drive Train and Axles	1.5
AMT 381	Ford ASSET Electronic Engine Control	4
AMT 382	Ford ASSET Gasoline Engine Performance	3
AMT 383	Ford ASSET Advanced Gasoline Engine Performance	3
A minimum of 3 units from the following:		3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
AMT 131	Ford ASSET Diesel Engine Performance	3
AMT 340	Emission Control Inspection and Repair	5
WELD 160	Welding Technology for the Automotive Industry	1.5
A minimum of 3 units from the following:		3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
Total Units:		59.5

Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

- Eligibility for ENGWR 101.
- Eligibility for MATH 100.
- Possess a valid driver's license with a driving record that is suitable for the sponsoring dealership's insurance requirements.
- Able to operate a vehicle equipped with a manual transmission.
- Meet sponsoring dealership hiring requirements which may include submitting to a drug test and/or criminal background check.
- Completion of an application for the Ford ASSET Program (can be found at <http://www.crc.losrios.edu/cars>).

Enrollment Process

Eligible students are selected for the program according to the following steps:

- Students are selected from the applicant pool in the order in which they are received.
- Only students who meet the stated eligibility requirements will be considered for the program.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO 1: Understand the fundamental purpose, components, and operation of major automotive systems to include gasoline engines, automatic transmissions and transaxles, manual transmissions, drivetrains, and axles, suspension and steering systems, brake systems, electrical and electronic systems, heating and air conditioning systems, and engine performance systems.
- PSLO 2: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical new car dealership hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- PSLO 3: Diagnose engine mechanical concerns, conduct diagnostic testing procedures, and perform the procedures and techniques involved in typical engine repairs and overhauls.
- PSLO 4: Demonstrate the ability to diagnose, service, and repair automatic transmissions and transaxles.
- PSLO 5: Demonstrate the ability to diagnose and repair manual transmissions, transaxles, and drive train concerns.
- PSLO 6: Demonstrate the ability to diagnose and repair automotive suspension and steering concerns.
- PSLO 7: Demonstrate the ability to diagnose and repair automotive brake systems.
- PSLO 8: Demonstrate the ability to diagnose and repair automotive electrical and electronic concerns.
- PSLO 9: Demonstrate the ability to diagnose and repair automotive heating, ventilation, and air conditioning (HVAC) system concerns.
- PSLO 10: Demonstrate the ability to diagnose, service, and repair gasoline engine performance systems and their components.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

- Automotive Technician
- Light Duty Diesel Technician
- Ford/Lincoln Specialized Technician (in any of the Service Technician Specialty Training [STST] areas)
- Ford/Lincoln Engine Master Technician
- Ford/Lincoln Chassis Master Technician
- Ford/Lincoln Drivetrain Master Technician
- Ford/Lincoln Senior Master Technician

Students who successfully complete the program will:

- Earn a certificate in Automotive Mechanics Technology.
- Be granted Ford Service Technician Specialty Training (STST) credentials.
- Be prepared for Automotive Service Excellence (ASE) certification in all Automobile series areas.
- Be eligible to sit for testing for both the California SMOG Inspector and SMOG Repair licenses.

Automotive Mechanics Technology Certificate

This one-year curriculum is designed for students who are seeking basic job entry skills for employment in the automotive field. Subsequent certificates and/or an Associate degree in Automotive Mechanics Technology can be earned without the need to repeat courses completed as part of this certificate. Completion of this certificate also represents completion of a National Automotive Technicians Education Foundation (NATEF) accredited Master Automotive Service Technology (MAST) program. Instructors for this program are Automotive Service Excellence (ASE) certified as required by NATEF standards.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 300	Automotive Fundamentals and Shop Procedures	4
AMT 303	Automotive Electrical & Electronic Systems	4
AMT 304	Automotive Manual Drive Train and Axles	3
AMT 310	Engine Performance	3
AMT 314	Wheel Alignment	3
AMT 316	Automotive Brakes	3
AMT 322	Engine Repair	3
AMT 324	Electronic Fuel Injection	3
AMT 326	Automotive Heating and Air Conditioning	3
AMT 330	Automatic Transmissions/Transaxles	3
AMT 332	Automotive Computerized Controls	3
A minimum of 5 units from the following:		5
AMT 140	Automotive Service (1)	
AMT 301	Automotive Service Management (3)	
AMT 305	Survey of Alternative Fueled & Hybrid Vehicles (3)	
AMT 306	Small Engine Repair (3)	
AMT 308	Late Model Car Care and Maintenance (3)	
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	
A minimum of 3 units from the following:		3
AMT 321	Advanced Automotive Electrical & Hybrid Vehicle Systems (3)	
AMT 328	Light Duty Diesel Engine Performance (3)	
AMT 336	Advanced Service Management (3)	
AMT 340	Emission Control Inspection and Repair (5)	
Total Units:		43

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO 1: Understand the fundamental purpose, components, and operation of major automotive systems to include gasoline engines, automatic transmissions and transaxles, manual transmissions, drivetrains, and axles, suspension and steering systems, brake systems, electrical and electronic systems, heating and air conditioning systems, and engine performance systems.
- PSLO 2: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical automotive shop hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- PSLO 3: Diagnose engine mechanical concerns, conduct diagnostic testing procedures, and perform the procedures and techniques involved in typical engine repairs and overhauls.
- PSLO 4: Demonstrate the ability to diagnose, service, and repair automatic transmissions and transaxles.
- PSLO 5: Demonstrate the ability to diagnose and repair manual transmissions, transaxles, and drive train concerns.
- PSLO 6: Demonstrate the ability to diagnose and repair automotive suspension and steering concerns.
- PSLO 7: Demonstrate the ability to diagnose and repair automotive brake systems.
- PSLO 8: Demonstrate the ability to diagnose and repair automotive electrical and electronic concerns.
- PSLO 9: Demonstrate the ability to diagnose and repair automotive heating, ventilation, and air conditioning (HVAC) system concerns.
- PSLO 10: Demonstrate the ability to diagnose, service, and repair gasoline engine performance systems and their components.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

Auto Technician; Auto/Truck Specialist; Automotive Microcomputer Programmer & Operator; Field Service/Sales Representative; Inventory Controls Manager; Tune-up & Electrical Specialist.

ASE certified in the areas of Brakes, Electrical/Electronic Systems, Engine Performance, Suspension and Steering, Automatic Transmission/Transaxle, Engine Repair, Heating and Air Conditioning, and Manual Drive Train and Axles.

Automotive Suspension and Steering (Ford ASSET) Certificate

This certificate represents a subset of the Ford Automotive Student Service Education Training (ASSET) Program and is intended for students wishing to specialize in automotive suspension and steering systems. This certificate is designed to help students develop the skills necessary to efficiently and accurately maintain, diagnose, and service/repair automotive suspension and steering systems.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 370	Ford ASSET Automotive Fundamentals and Dealership Practices	4
AMT 371	Ford ASSET Automotive Electrical/Electronic Systems	3

COURSE CODE	COURSE TITLE	UNITS
AMT 374	Ford ASSET Automotive Suspension and Steering	3
AMT 375	Ford ASSET Automotive Wheel Alignment	3
Total Units:		13

Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

- Eligibility for ENGWR 101.
- Eligibility for MATH 100.
- Possess a valid driver's license with a driving record that is suitable for the sponsoring dealership's insurance requirements.
- Able to operate a vehicle equipped with a manual transmission.
- Meet sponsoring dealership hiring requirements which may include submitting to a drug test and/or criminal background check.
- Completion of an application for the Ford ASSET Program (can be found at <http://www.crc.losrios.edu/cars>).

Enrollment Process

Eligible students are selected for the program according to the following steps:

- Students are selected from the applicant pool in the order in which they are received.
- Only students who meet the stated eligibility requirements will be considered for the program.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO 1: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical new car dealership hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- SLO 2: Understand the fundamental purpose, components, and operation of automotive suspension and steering systems.
- SLO 3: Demonstrate the ability to diagnose and repair automotive suspension and steering systems.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

Automotive Maintenance / Light Repair Technician Ford/Lincoln Specialized Technician (in Service Technician Specialty Training [STST] area 33-Steering and Suspension)

Automotive Suspension and Steering Certificate

This curriculum is designed for students interested in seeking employment in the automotive suspension, steering, or wheel alignment fields.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 300	Automotive Fundamentals and Shop Procedures	4
AMT 303	Automotive Electrical & Electronic Systems	4
AMT 310	Engine Performance	3
AMT 314	Wheel Alignment	3
AMT 332	Automotive Computerized Controls	3
Total Units:		17

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- Explain the proper use of service publications used in diagnostic procedures.
- Recognize electronic principles and how they relate to particular automotive systems.
- Diagnose vehicle alignment angle concerns.
- Explain theory and operations of automotive computerized controls.

Manual Drive Train and Axles (Ford ASSET) Certificate

This certificate represents a subset of the Ford Automotive Student Service Education Training (ASSET) Program and is intended for students wishing to specialize in manual transmissions/transaxles, drive trains, and axles. This certificate is designed to help students develop the skills necessary to efficiently and accurately maintain, diagnose, and service/repair manual transmissions/transaxles, drive trains, and axles.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 370	Ford ASSET Automotive Fundamentals and Dealership Practices	4
AMT 374	Ford ASSET Automatic Transmissions/Transaxles	3
AMT 385	Ford ASSET Automotive Manual Drive Train and Axles	3
AMT 498	Work Experience in Automotive Mechanics Technology (1 - 4)	11.5
Total Units:		11.5

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Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

- Eligibility for ENGWR 101.
- Eligibility for MATH 100.
- Possess a valid driver's license with a driving record that is suitable for the sponsoring dealership's insurance requirements.
- Able to operate a vehicle equipped with a manual transmission.
- Meet sponsoring dealership hiring requirements which may include submitting to a drug test and/or criminal background check.
- Completion of an application for the Ford ASSET Program (can be found at <http://www.crc.losrios.edu/cars>).

Enrollment Process

Eligible students are selected for the program according to the following steps:

- Students are selected from the applicant pool in the order in which they are received.
- Only students who meet the stated eligibility requirements will be considered for the program.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- SLO 1: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Understand typical new car dealership hierarchy, structure, and standard procedures.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- SLO 2: Understand the fundamental purpose, components, and operation of manual transmissions/transaxles, drive trains, and axles.
- SLO 3: Demonstrate the ability to diagnose and repair manual transmissions, transaxles, and drive train concerns.
- Verify the outcome of the repair through a test drive analysis or system self-test.

Career Information

Automotive Technician (Clutch Specialist) Manual Transmission Technician Ford/Lincoln Specialized Technician (in Service Technician Specialty Training [STST] area 36-Manual Transmissions)

Small Engine Repair Certificate

This curriculum is designed for students who are interested in obtaining skills necessary for the repair of small engines used in industry, home maintenance, landscape maintenance and recreation.

Catalog Date: June 1, 2019

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
AMT 303	Automotive Electrical & Electronic Systems	4

COURSE CODE	COURSE TITLE	UNITS
AMT 306	Small Engine Repair	3
AMT 310	Engine Performance	3
AMT 324	Electronic Fuel Injection	3
Total Units:		13

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- Recognize electronic principles and how they relate to particular automotive systems.
- Perform the necessary repair procedure for a certain set electrical/electronic diagnostic problems.
- Diagnose small engine operation concerns.
- Assess and repair small engine systems.
- Understand theory and operation of electronic fuel injection.
- Demonstrate the ability to repair electronic fuel injection systems.

Automotive Mechanics Technology (AMT)

AMT 130 Ford ASSET Advanced Automatic Transmission Diagnosis

Units:	1.5
Hours:	27 hours LEC
Prerequisite:	None.
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course provides a review of electronically controlled automatic transmissions and transaxles to include electronic control system theory, hydraulic/mechanical system theory, electronic testing procedures, hydraulic testing procedures, mechanical testing procedures, module programming and configuration, and adaptive shift strategies. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the theory and operation of advanced electronically controlled automatic transmissions and transaxles.
- Explain the operation of advanced automatic transmission and transaxle electronic control systems.
- Explain the operation of advanced automatic transmission and transaxle hydraulic and mechanical systems.
- SLO 2: Demonstrate the ability to diagnose advanced automatic transmission and transaxle concerns.
- Identify advanced automatic transmission and transaxle components.

- Perform mechanical testing of advanced automatic transmission and transaxle concerns to evaluate component condition and/or system operation.
- Perform hydraulic testing of advanced automatic transmission and transaxle concerns to evaluate component condition and/or system operation.
- Perform electronic testing of advanced automatic transmission and transaxle concerns to evaluate component condition and/or system operation.
- SLO 3: Demonstrate the ability to repair advanced automatic transmission and transaxle concerns.
- Select, service, and replace advanced automatic transmission and transaxle components based upon inspection and measurement using manufacturer's specifications and procedures.
- Perform necessary module programming and/or configuration as part of the repair procedure.
- Perform necessary re-learn strategies after resetting adaptive shift strategies as part of the repair procedure.

AMT 131 Ford ASSET Diesel Engine Performance

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 371 with a grade of "C" or better
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course provides a review of light duty diesel engine performance systems to include diesel engine theory, air induction systems, fuel systems, starting aid systems, emission controls, and exhaust after-treatment systems. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the basic operation of light duty diesel engines and associated systems.
- Explain the operation of light duty four stroke cycle diesel engines.
- Explain the operation of light duty diesel engine fuel supply and fuel injection systems.
- Explain the operation of light duty diesel engine air induction systems.
- Explain the operation of light duty diesel engine starting aid systems.
- Explain the operation of light duty diesel engine emission control systems.
- Explain the operation of light duty diesel engine exhaust after-treatment systems.
- Explain the operation of light duty diesel electronic engine control systems.
- SLO 2: Demonstrate the ability to diagnose light duty diesel engine performance concerns.
- Identify light duty diesel engine performance components.

- Perform mechanical testing of light duty diesel engine performance concerns to evaluate component condition and/or system operation.
- Perform electronic testing of light duty diesel engine performance concerns to evaluate component condition and/or system operation.
- SLO 3: Demonstrate the ability to repair light duty diesel engine performance concerns.
- Select, service, and replace light duty diesel engine performance components based upon inspection and measurement using manufacturer's specifications and procedures.

AMT 140 Automotive Service

Units:	1
Hours:	15 hours LEC; 9 hours LAB
Prerequisite:	None.
Catalog Date:	June 1, 2019

This is a short-term course designed to enable students to gain skills in a specialized automotive area and to assist the student in preparation for state licensure requirements when applicable. Some of the service system topics that may be scheduled include: brakes, charging, alignment, brakes, automatic transmission, air conditioning and service management. Consult class schedule for specific topics being offered.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Describe industry standards for automotive service.
- Identify service publications that define service standards.
- Explain the importance service standards for effective repair.
- SLO 2: Appraise vehicle condition based upon industry standards.
- Perform basic mechanical diagnostic procedures for automotive service.
- Perform basic electronic diagnostic procedures for automotive service.
- SLO 3: Demonstrate the ability to perform service to industry standards.
- Select, service, and replace vehicle components based upon inspection and measurement using manufacturer's specifications.
- Verify service quality in accordance with industry standards.

AMT 294 Topics in Automotive Mechanics Technology

Units:	0.5 - 4
Hours:	9 - 72 hours LEC
Prerequisite:	None.
Catalog Date:	June 1, 2019

This course covers special topics not included in current automotive offerings in a timely manner. Topics may be offered in workshops or seminar presentations on timely subjects or targeted for specific audiences.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- (SLO1): Demonstrate the skills and competencies necessary for effective diagnosis of vehicle systems.
- (SLO2): Demonstrate the skills and competencies necessary for effective repair of vehicle systems.
- (SLO3): Demonstrate the skills and competencies necessary for effective customer service within the Automotive Industry.

AMT 295 Independent Studies in Automotive Mechanics Technology

Units:	1 - 3
Hours:	54 - 162 hours LAB
Prerequisite:	None.
Catalog Date:	June 1, 2019

An independent studies project involves an individual student or small group of students in study, research, or activities beyond the scope of regularly offered courses. See the current catalog section of "Special Studies" for full details of Independent Studies.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Actively engage in intellectual inquiry beyond that required in order to pass a course of study (College Wide Learning Outcome – Area 4).
- Discuss and outline a proposal of study (that can be accomplished within one semester term) with a supervising instructor qualified within the discipline.
- Design an independent study (to be completed individually or by collaboration of a small group) to foster special knowledge, skills, and experience that are not available in any one regularly scheduled course.
- Use information resources to gather discipline-specific information.
- SLO #2: Utilize modes of analysis and critical thinking to apply theoretical perspectives and/or concepts in the major discipline of study to significant problems and/or educational activities (College Wide Learning Outcome – Area 3).
- Analyze and apply the knowledge, skills and experience that are involved in the independent study to theoretical perspectives and/or concepts in the major discipline of study.
- Explain the importance of the major discipline of study in the broader picture of society.
- SLO #3: Communicate a complex understanding of content matter of the major discipline of study (College Wide Outcome – Area 3).

- Demonstrate competence in the skills essential to mastery of the major discipline of study that are necessary to accomplish the independent study.
- SLO #4: Identify personal goals and pursue these goals effectively (College Wide Outcome – Area 4).
- Utilize skills from the “academic tool kit” including time management, study skills, etc., to accomplish the independent study within one semester term.

AMT 300 Automotive Fundamentals and Shop Procedures

Units:	4
Hours:	72 hours LEC
Prerequisite:	None.
Transferable:	CSU
General Education:	AA/AS Area III(b) (effective Summer 2019)
Catalog Date:	June 1, 2019

This course includes a basic study of vehicles and their mechanical systems including vehicle purchase, vehicle maintenance, vehicle safety systems and the principles and operation of the automotive engine, engine support systems, the drive train, steering, suspension and brakes. This class also explores consumers legal rights concerning vehicle purchase, repair, replacement and recalls. Hand tools, shop equipment and shop procedures will be demonstrated to familiarize the students with the automotive industry.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Describe the fundamentals of vehicle systems to include: vehicle safety systems, engine operation and repair, automatic transmissions/transaxles, manual drive train and axles, suspension and steering, brakes, electrical and electronic systems, heating and air conditioning, and engine performance.
- Explain the purpose and operation of specific vehicle systems.
- Identify the components of vehicle systems and their interaction with other systems and components.
- SLO #2: Describe the fundamentals of diagnosing vehicle systems.
- Identify common vehicle diagnostic equipment.
- Explain the proper use of service publications used in diagnostic procedures.
- Explain how to perform fundamental diagnostic procedures as outlined in manufacturer service publications.
- SLO #3: Describe and apply the fundamentals in repairs of major vehicle systems.
- Demonstrate knowledge of how to perform typical vehicle maintenance service.
- Explain how to follow a repair procedure as outlined in manufacturer service publications.
- Demonstrate knowledge of shop safety, OSHA, and hazardous materials procedures.
- SLO #4: Become an informed consumer that understands his or her legal rights and can make informed economic decisions related to vehicle purchase, maintenance, and repair by demonstrating competence in locating and evaluating information readily available to automotive consumers.

- Locate and interpret vehicle maintenance and service schedules in order to identify components and systems that require periodic inspection and/or maintenance.
- Compare maintenance and use costs of different vehicles using published information.
- Compare costs, coverage, and benefits/drawbacks of various warranty types including: manufacturer new-car warranties, extended warranties (both manufacturer and aftermarket), and emissions warranties.
- Evaluate vehicle purchase options including vehicle ergonomics, pricing, safety systems, warranty options, and financing.
- Examine legal rights of automotive consumers related to: vehicle purchasing, vehicle repair, vehicle lemon law, warranty denial, and consumers bill of rights concerning vehicle repair.

AMT 301 Automotive Service Management

Units:	3
Hours:	54 hours LEC
Prerequisite:	None.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course provides a survey of automotive service operations, management strategies, economic importance, regulatory responsibilities, customer relations, and employment opportunities in the automotive service industry.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Identify the major types of repair organizations that comprise the auto service industry.
- Evaluate the benefits and deficiencies of different types of service facilities.
- SLO 2: Calculate the total investment in facilities and equipment required to operate a service shop.
- Describe requirements and procedures necessary to start and open a small auto service business.
- Analyze methods of financial measurement of income, expenses, and compensation in the automotive service environment.
- SLO 3: Examine best automotive service practices in employee and customer relations.
- Evaluate the basic qualities that establish value in marketing an automotive product or service.
- SLO 4: Describe the implications of the repair order as a legal contract in California.
- Identify the major areas of legal responsibilities in customer transactions.

AMT 303 Automotive Electrical & Electronic Systems

Units:	4
Hours:	45 hours LEC; 81 hours LAB
Prerequisite:	None.
Advisory:	AMT 300
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is a study of the fundamental principles of electricity as used by the auto technician. Construction and function of automotive electrical/ electronic components and systems will be discussed, including storage batteries, charging and starting systems, lighting, and accessory systems.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Describe theory and operation of Automotive Electrical/Electronic Systems.
- Explain general electrical/electronic system principles.
- Explain battery systems and the relationship to electronic systems.
- Explain starting and charging systems.
- Identify components of automotive electrical systems.
- Explain lighting and driver information systems.
- Recognize electronic principles and how they relate to particular automotive systems.
- Identify electrical/electronic system failures.
- SLO 2: Diagnose automotive electrical/electronic concerns.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause and correction.
- Research applicable vehicle and service information, such as electrical/electronic system operation, system specifications, technical service bulletins, vehicle service history, and service precautions.
- Explain the proper use of technical service publications used in diagnostic procedures.
- Recall and apply step-by-step diagnostic procedures.
- Apply the use of scan-tools and digital multi meters (DMM) accurately.
- Perform road or system tests to verify customers concern.
- SLO #3: Repair automotive electrical/electronic systems.
- Perform the necessary repair procedure for a certain set of electrical/electronic diagnostic problems.
- Perform disassembly, inspection, testing, and reassembly of automotive electronic/electrical systems.
- Identify and apply the use of special tools necessary to repair automotive electrical/electronic systems.
- Perform the outcome of the repair through the test drive analysis.

AMT 304 Automotive Manual Drive Train and Axles

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	None.
Advisory:	AMT 300
Transferable:	CSU
Catalog Date:	June 1, 2019

This course covers the principles of operations of automotive power trains, including diagnosis and overhaul techniques of clutches, manual transmission/transaxles, transfer cases, drive lines and differentials.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the operation of clutches, manual transmissions, transaxles, transfer cases, drive shafts, and axle assemblies (powertrain).
- Explain the use of torque in manual transmissions.
- Explain the relationship between torque, speed and gear ratios.
- Identify the components in manual transmissions, and transaxles.
- Identify the components of transfer cases, clutches, drive shafts, and axle assemblies.
- Explain the flow of power through manual transmissions and transaxles.
- Explain the flow of power through clutches and axle assemblies.
- SLO 2: Demonstrate the ability to diagnose manual powertrain concerns.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Perform noise diagnosis of the manual powertrain.
- Perform vibration diagnosis of the manual powertrain.
- Perform mechanical diagnosis of manual powertrain concerns.
- SLO 3: Demonstrate the ability to repair the manual powertrain system.
- Perform disassembly and reassembly of manual transmissions.
- Perform disassembly and reassembly of manual transaxles.
- Select, service, and replace powertrain components based upon inspection and measurement and manufacture's specifications

AMT 305 Survey of Alternative Fueled & Hybrid Vehicles

Units:	3
Hours:	54 hours LEC
Prerequisite:	None.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course will provide the students with resources and relevant information about the technologies of alternative fueled, electric and hybrid vehicle powertrains, as well as the impacts of their wider application in society. While the course will have a technical component, the larger focus of the course is targeted at both the automotive and non-automotive student. Access to a computer with Internet capabilities will be necessary for this course.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Explain the role of hybrid and alternative fuel vehicles in today's society.
- Research the technology used in hybrid and alternative fuel vehicles in contemporary society
- Evaluate the different types of hybrid and alternative-fueled vehicles.
- Assess alternatives to carbon-based fuels, including factors needed to reduce the carbon footprint.
- SLO 2: Analyze the operation of internal combustion, alternative fuel and hybrid powered vehicles.
- Assess current Internal Combustion Engine (ICE) technology.
- Identify major components and systems used in serial and parallel hybrid powertrains.
- SLO 3: Explain the safety procedures used while servicing alternative fuel and hybrid vehicles.

AMT 306 Small Engine Repair

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	None.
Advisory:	AMT 300
Transferable:	CSU
Catalog Date:	June 1, 2019

This course focuses on operation and repair of small four-cycle engines. There is special emphasis placed on design and operation principles of internal combustion engines that support the student's understanding of automotive engines.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Describe the purpose of the small engines in current use.
- Explain the operation of small engines.
- Explain the operation of the combustion cycle of small engines.
- Identify the components of small engines.

- Determine correct small engine size for its intended application.
- SLO 2: Diagnose small engine operation concerns.
- Prepare draft work orders to include customer information, engine identifying information, customer concern, related service history, cause and correction.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Perform noise and vibration diagnosis of concerns caused by engine operation or improper engine mounting.
- Perform mechanical diagnosis of small engine systems as described in service publications.
- Perform electronic diagnosis of small engine systems as described in service publications.
- SLO 3: Assess and repair small engine systems.
- Perform disassembly and reassembly of small engine components.
- Select, service, and replace small engine components based upon inspection and measurement using manufacturer's specifications and procedures.
- Verify repair using small engine in its intended application.
- Apply proper safety practices as outlined in service publications.
- List safety concerns related to hazardous materials with regards to current industry regulations and standards.

AMT 308 Late Model Car Care and Maintenance

Units:	3
Hours:	54 hours LEC
Prerequisite:	None.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is designed for the service technician and late model car owner wishing to perform or schedule car maintenance. This course will provide both men and women with basic automotive repair procedures and a fundamental understanding of how various automotive components and systems work. Use of the owner's manual, repair orders and other resources will be emphasized along with the development of a preventative maintenance schedule.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- understand how to service various automotive systems.
- develop preventative maintenance schedules.
- use the car's owner's manual.
- understand repair orders.
- perform basic car repairs that all car owners should know how to do.

AMT 310 Engine Performance

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 300, 306, or 322 with a grade of "C" or better
Advisory:	AMT 303
Transferable:	CSU
Catalog Date:	June 1, 2019

This course covers basic principles of the internal combustion engine and its related components, with an emphasis on complete electrical and fuel systems. The course will include the use of advanced types of testing equipment.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Demonstrate understanding of engine performance systems and their relationships.
- Identify major engine performance components and systems.
- Describe the relationships of mechanical, fuel, ignition and emissions systems to one another.
- SLO #2: Perform engine performance-related services and repairs.
- Perform mechanical services including component adjustments, removal and replacement.
- Perform ignition services, including component removal and replacement.
- Perform fuel system services, including cleaning, component removal and replacement.
- SLO #3: Diagnose engine performance systems.
- Perform basic engine diagnostic checks, such as engine condition and cooling system tests.
- Use the automotive exhaust gas analyzer to test the air/fuel ratio for better performance and fuel economy.
- Evaluate engine performance systems in relationship to manufacturer's specifications.
- Diagnose driveability problems using oscilloscope and scan-tool technology.

AMT 314 Wheel Alignment

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	None.
Transferable:	CSU
Catalog Date:	June 1, 2019

An in-depth examination of alignment equipment and different auto manufacturer's alignment systems. Will cover wheel balancing and front end steering and wheel alignment, diagnosis and repair.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Describe the purpose of alignment procedures.
- Explain the relationship between caster, camber and toe.
- Recall and accurately apply the operation of alignment equipment.
- Identify the components of the suspension system.
- Explain adjustment angles.
- SLO 2: Diagnose vehicle alignment angle concerns.
- Prepare a work order to include customer information, vehicle identifying information, customer concern, related service history, cause and correction.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Perform noise diagnosis caused by alignment angles not within specifications.
- Perform vibration diagnosis of tires and wheels.
- Perform mechanical diagnosis of alignment angles.
- SLO 3: Apply the adjustment of alignment angles.
- Perform disassembly and reassembly suspension components.
- Perform two wheel alignment(s).
- Perform four wheel alignment(s).
- Select, service, and replace alignment components based upon inspection and measurement and manufacture's specifications
- Demonstrate proper safety practices as outlined in service publications.
- Demonstrate the proper use of special tools as directed in service publications.
- List safety concerns related to hazardous materials with regards to hazardous materials regulations.

AMT 316 Automotive Brakes

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	None.
Advisory:	AMT 300
Transferable:	CSU
Catalog Date:	June 1, 2019

This course covers the principles of operation of automotive brakes and anti-lock brake systems, including diagnosis and overhaul techniques of power brake system components.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand theory and operation of automotive brake systems.
- Explain the purpose of conventional, anti-lock, traction control and electronic stability assist brake systems.
- Identify brake systems components.
- Explain the operation of conventional, anti-lock, traction control and electronic stability assist brake systems.
- Describe the effect the following principles have on brake system operation: vehicle speed-weight ratios, friction, simple hydraulics, brake fluid viscosity and composition.
- SLO 2: Demonstrate the ability to diagnose automotive brake systems.
- Demonstrate the ability to write repair orders to include: customer information, vehicle identifying information, customer concern, related service history, cause and correction.
- Research applicable vehicle and service information, such as engine management system operation, type of braking systems, vehicle service history, service precaution, and technical service bulletins.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Demonstrate the ability to follow step-by-step diagnostic procedures.
- Demonstrate the use of diagnostic equipment.
- Perform road test to verify the customer concern.
- SLO 3: Demonstrate the ability to repair automotive brake systems.
- Demonstrate the ability to test brake system components.
- Perform removal and replacement of brake system components.
- Perform bleeding procedure.
- Demonstrate adjustment procedures as outlined in the service manual.
- Demonstrate the use of special tools necessary to repair automotive brake systems.
- Perform the outcome of the repair through the test drive analysis.
- List safety concerns related to hazardous materials with regards to "Hazardous Materials Regulations".

AMT 321 Advanced Automotive Electrical & Hybrid Vehicle Systems

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 303 with a grade of "C" or better
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is a study of the principles of electronic systems serviced by the automotive technician. Construction and function of automotive electronic components and systems will be discussed, including general system diagnosis, driver information systems, vehicle communication networks, hybrid vehicle propulsion technology and controls, and electronic accessory systems.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Describe the theory and operation of Electronic Control Systems.
- Explain general electrical/electronic system principles.
- Explain hybrid electric vehicle propulsion systems and their relationship to electronic controls.
- Explain driver information systems and their relationship to electronic control systems.
- Identify the components of Electronic Control Systems.
- Explain vehicle communication network principles.
- Explain electronic accessory system principles.
- Recognize electronic principles and how they relate to hybrid vehicle automotive systems.
- Identify electronic system failures.
- SLO 2: Diagnose automotive electronic control system concerns.
- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause and correction.
- Research applicable vehicle and service information, such as electrical/electronic system operation, system specifications, technical service bulletins, vehicle service history, and service precautions.
- Explain the proper use of technical service publications used in diagnostic procedures.
- Recall and apply step-by-step diagnostic procedures.
- Apply the use of scan-tools and digital multi meters (DMM) accurately.
- Perform road or system tests to verify the customer's concern.
- SLO 3: Repair automotive electronic control systems.
- Perform the necessary repair procedure for a certain set of electronic control system diagnostic problems.
- Perform disassembly, inspection, testing, and reassembly of electronic control systems in gasoline and hybrid electric powered vehicles.
- Identify and apply the use of special tools necessary to repair automotive electronic control systems, and hybrid electric vehicle propulsion systems.
- Verify the outcome of the repair through the test drive analysis.

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	None.
Advisory:	AMT 300 and 306
Transferable:	CSU
Catalog Date:	June 1, 2019

This course focuses on the theory of operation and repair of the automotive internal combustion engine. Major emphasis will be on diagnosis, measurement, repair and assembly of the automotive engine.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the basic operation of automotive engines.
- Explain the four stroke cycle.
- Explain the relationship of mechanical components in the engine.
- Explain how engines are classified.
- SLO 2: Diagnose engine mechanical concerns and conduct diagnostic testing procedures.
- Perform engine noise diagnosis.
- Perform basic engine mechanical diagnostic procedures.
- SLO 3: Perform the procedures and techniques involved in a gasoline engine overhaul.
- Disassemble, clean, inspect and measure all components of the engine.
- Perform machining operations on the engine block and cylinder heads to manufacture's specifications.
- Select, service, and replace engine components based upon inspection and measurement and manufacture's specifications.
- Reassemble the engine components.

AMT 324 Electronic Fuel Injection

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 303 with a grade of "C" or better
Advisory:	AMT 310
Transferable:	CSU
Catalog Date:	June 1, 2019

This course focuses on the theory and operation, service, diagnostic procedures, and repair of electronic fuel injection systems. This course includes the various types of electronic fuel injection systems and the diagnostic equipment currently used in the automotive industry. In addition, also covered in this course are the theory and operation, and service of intake and exhaust systems, and forced induction systems such as superchargers and turbochargers.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand theory and operation of electronic fuel injection.
- Explain the purpose of electronic fuel injection.
- Identify the components of electronic fuel injection.
- Explain the operation of electronic fuel injection.
- SLO 2: Demonstrate the ability to diagnose electronic fuel injection.
- Demonstrate the ability to write repair orders to include: customer information, vehicle identifying information, customer concern, related service history, cause and correction.
- Research applicable vehicle and service information, such as engine management system operation, vehicle service history, service precautions, and technical service bulletins.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Demonstrate the ability to follow step-by-step diagnostic procedures.
- Demonstrate the use of diagnostic equipment.
- Perform road test to verify the customer concern.
- SLO 3: Demonstrate the ability to repair electronic fuel injection.
- Demonstrate the ability to test fuel injection systems and components.
- Perform removal and replacement of electronic fuel injection components.
- Demonstrate adjustment procedures.
- Demonstrate the use of special tools necessary to repair electronic fuel injection.
- Perform the outcome of the repair through the test drive analysis.
- List safety concerns related to hazardous materials with regards to "Hazardous Materials Regulations".

AMT 326 Automotive Heating and Air Conditioning

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	None.
Corequisite:	AMT 302 or 303
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is a study of installation, operation and repair of automotive air conditioning systems, cooling systems, and heating systems. The course will include a study of the systems for proper functioning including heat transfer and air flow.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the basic operation of automotive air conditioning (A/C) and engine cooling systems.
- Explain heat and pressure relationships.
- Identify A/C specific components on the vehicle.
- Explain the operation of A/C components.
- Explain cooling system operation.
- Identify A/C specific and general tools used in the diagnosis and repair of automotive A/C and cooling systems.
- SLO 2: Diagnose automotive air conditioning (A/C) and cooling system concerns.
- Prepare the vehicle for testing.
- Perform the visual and touch procedures to diagnose the A/C system.
- Perform mechanical diagnosis of the A/C and cooling systems.
- Perform electronic diagnosis of the A/C and cooling systems.
- Explain the proper use of technical service information.
- SLO 3: Repair automotive air conditioning (A/C) and cooling systems.
- Identify and replace faulty components in the A/C system using industry accepted practices.
- Identify and replace faulty components in the cooling system using industry accepted practices.

AMT 328 Light Duty Diesel Engine Performance

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 303 with a grade of "C" or better
Advisory:	AMT 300
Transferable:	CSU
Catalog Date:	June 1, 2019

This course introduces the student to light duty diesel engine performance systems to include diesel engine theory, air induction systems, fuel systems, starting aid systems, emission controls, and exhaust after-treatment systems.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the basic operation of light duty diesel engines and associated systems.
- Explain the operation of light duty four stroke cycle diesel engines.
- Explain the operation of light duty diesel engine fuel supply and fuel injection systems.
- Explain the operation of light duty diesel engine air induction systems.
- Explain the operation of light duty diesel engine starting aid systems.
- Explain the operation of light duty diesel engine emission control systems.

- Explain the operation of light duty diesel engine exhaust after-treatment systems.
- Explain the operation of light duty diesel electronic engine control systems.
- SLO 2: Demonstrate the ability to diagnose light duty diesel engine performance concerns.
- Identify light duty diesel engine performance components.
- Perform mechanical testing of light duty diesel engine performance concerns to evaluate component condition and/or system operation.
- Perform electronic testing of light duty diesel engine performance concerns to evaluate component condition and/or system operation.
- SLO 3: Demonstrate the ability to repair light duty diesel engine performance concerns.
- Select, service, and replace light duty diesel engine performance components based upon inspection and measurement using manufacturer's specifications and procedures.

AMT 330 Automatic Transmissions/Transaxles

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	None.
Advisory:	AMT 300 and 304
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is a study of the fundamentals and theory of automatic transmissions/transaxles. The laboratory experience will include inspection, diagnosis and adjustments.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand theory and operation of automatic transmissions/transaxles.
- Explain the use of torque in automatic transmissions/transaxles.
- Explain the relationship between torque, speed, and gear ratios.
- Identify components.
- Explain flow of power through automatic transmissions/transaxles.
- Explain operation of torque converters.
- Explain hydraulic principles.
- Understand how the electrical/electronic systems work.
- Understand how to identify types of transmissions/transaxles.
- SLO 2: Demonstrate the ability to diagnose automatic transmission/transaxle concerns.

- Demonstrate the ability to write repair orders to include: customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
- Research applicable vehicle and service information, such as transmission/transaxle system operations, transmission/transaxle types, fluid type, vehicle service history, service precautions and technical service bulletins.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Demonstrate the ability to follow step-by-step diagnostic procedures.
- Demonstrate the use of scan tools and digital multi meters (DMM).
- Perform road test to verify the customer concern.
- SLO 3: Demonstrate the ability to repair automatic transmissions/transaxles.
- Perform the necessary repair procedure for a certain set of transmission diagnostic problems.
- Perform disassembly and reassembly of automatic transmissions/transaxles. Clean, inspect, measure, repair, adjust, or replace components.
- Demonstrate the use of special tools necessary to repair automatic transmissions/transaxles.
- Perform the outcome of the repair through the test drive analysis.
- List safety concerns related to hazardous materials with regards to "Hazardous Materials Regulations".

AMT 332 Automotive Computerized Controls

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 303 with a grade of "C" or better
Advisory:	AMT 310
Transferable:	CSU
Catalog Date:	June 1, 2019

This course focuses on the study of automotive computerized controls and their application to the engine, chassis and braking systems. Students will learn how on board computers interact with modern vehicle systems.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Explain theory and operations of automotive computerized controls.
- Explain the use of computers in engine system management.
- Explain the relationships between input sensors, processing and output sensors.
- Identify components within computerized controls.
- Explain the generations of government mandated diagnostics in relation to system operation.
- Describe how computerized electronic systems work.
- Identify various generations of computerized control systems.

- SLO #2: Diagnose automotive computerized control concerns.
- Prepare and write repair orders to include: customer information, vehicle identification information, customer concern, related service history, cause, and correction.
- Research applicable vehicle and service information, such as type of on board diagnostics, code structure, emission compliance level, monitor status, vehicle service history, service precautions, and technical service bulletins.
- Explain the proper use of technical service bulletins used in diagnostic procedures.
- Perform step-by-step diagnostic procedures.
- Apply the use of scan-tools and digital multi meters (DMM).
- Perform road test to verify the customer concern.
- SLO #3: Repair automotive computerized control systems
- Perform the necessary repair procedures for a certain set of automotive computerized control diagnostic problems.
- Perform inspection, testing, disassembly, component replacement, reassembly, and confirmation of repair on automotive computerized control systems.
- Demonstrate the use of specialized on board test sequences to repair automotive computerized control systems.
- Perform the outcome of the repair through data stream analysis.
- List safety concerns related to hazardous materials with regards to "hazardous materials regulations".

AMT 336 Advanced Service Management

Units:	3
Hours:	54 hours LEC
Prerequisite:	None.
Advisory:	AMT 301
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is a thorough examination of automotive service management. The course includes strategic planning, financial analysis, personnel management, and automotive service legal responsibilities.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1- Compare and contrast the major types of repair organizations that comprise the service industry.
- SLO 2- Define the major roles of strategic planning in automotive service management systems.
- Calculate the total investment required to properly equip and operate an auto service facility.
- Develop a plan to select and maintain appropriate employees for the service environment.
- SLO 3- Assess the importance of applying ethical standards to the management of an organization.
- SLO 4- Evaluate management of profit and the various ways profit is used in a service environment.

- Analyze the impact of various methods of controlling operating costs.

AMT 340 Emission Control Inspection and Repair

Units:	5
Hours:	72 hours LEC; 54 hours LAB
Prerequisite:	AMT 303 and 310 with grades of "C" or better; AMT 371 and AMT 381 are included in the Ford ASSET Program and can be utilized to meet requisite requirements in lieu of the standard requisites. Current ASE certification in A-6 and A-8 meet equivalency for enrollment in AMT 340 per State of California, Bureau of Automotive Repair Statute.
Advisory:	AMT 324 and 332
Transferable:	CSU
Catalog Date:	June 1, 2019

This course includes inspection, testing, diagnosis, and service of automotive emission control systems. The course is required for all students who plan to become licensed as a SMOG Check Inspector. Upon successful completion of this course, students are eligible to take the State of California SMOG Check Inspector licensing exam and may be eligible to take the State of California SMOG Check Repair Technician licensing exam.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Identify the fundamentals of automotive emission systems to include electrical, vacuum, computerized vehicle emission components, emission regulations, emission testing, emission reduction systems, and emission inspection/diagnostic equipment.
- Explain the purpose of automotive emission systems.
- Identify the components of automotive emission systems.
- Explain the cause and effect of automotive emissions.
- Identify components of the emission system that require visual and functional inspection and/or maintenance.
- SLO 2: Recognize the fundamentals of diagnosing automotive emission systems.
- Identify diagnostic equipment.
- Explain the proper use of service publications used in diagnostic/testing procedures.
- Explain how to perform fundamental emission diagnostic/testing as outlined in both manufacture and industry publications.
- Describe the laws, regulations, and procedures associated with consumer authorization of inspections and the overall administration of the Smog Check Program.
- SLO 3: Apply the fundamentals of vehicle emission system repairs.
- Identify the proper service procedures as outlined in manufacturer's service manuals.

- Demonstrate knowledge of how to perform systematic flow chart diagnosis of vehicle emission systems.
- Explain how to repair specific vehicle emission systems.
- Demonstrate knowledge of shop safety, OSHA, and hazardous materials procedures.

AMT 370 Ford ASSET Automotive Fundamentals and Dealership Practices

Units:	4
Hours:	72 hours LEC
Prerequisite:	None.
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program. Some training materials utilized in this course require access to restricted Ford Motor Company websites obtained via enrollment in the Ford Automotive Student Service Education Training (ASSET) program and establishment of a Ford/Lincoln dealership sponsorship.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course provides an introduction into the theory and operation of major automotive systems including: gasoline engines, electrical systems, transmissions and drivetrains, steering, suspension, and brakes. Common automotive hand tools, power tools, and equipment will also be introduced and demonstrated to familiarize students with a typical automotive shop. Typical new-car dealership hierarchy and structure along with standard practices will be investigated. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the fundamental purpose, components, and operation of major automotive systems.
- Explain the basic theory and operation of gasoline engines.
- Explain the basic theory and operation of automatic transmissions and transaxles.
- Explain the basic theory and operation of manual transmissions, drivetrains, and axles.
- Explain the basic theory and operation of suspension and steering systems.
- Explain the basic theory and operation of brake systems.
- Explain the basic theory and operation of electrical and electronic systems.
- Explain the basic theory and operation of heating and air conditioning systems.
- Explain the basic theory and operation of engine performance systems.
- SLO 2: Understand the proper use of tools, equipment, and publications used for automotive diagnosis and repair.
- Identify common hand tools, power tools, and diagnostic equipment, and their appropriate usage.
- Explain proper vehicle lifting procedures.

- Demonstrate knowledge of shop safety, OSHA, and hazardous materials procedures.
- Perform proper vehicle identification to ensure accurate diagnosis and repair.
- Locate and analyze service information in hard copy and electronic formats.
- Identify the proper maintenance interval schedule as outlined in the vehicle owner's manual.
- SLO 3: Understand typical new car dealership hierarchy, structure, and standard procedures.
- Identify and explain key job roles and chain-of-command in new car dealership parts and service departments.
- Demonstrate knowledge of Bureau of Automotive Repair (BAR) regulations relating to work/repair orders.
- Demonstrate knowledge of manufacturer warranty policies and procedures.
- Demonstrate knowledge of new car pre-delivery inspection procedures.

AMT 371 Ford ASSET Automotive Electrical/Electronic Systems

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	None.
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course is a study of the fundamental principles of electricity and electronic systems as used by the automotive technician. Construction and function of automotive electrical and electronic components will be discussed, including batteries, starting systems, charging systems, lighting systems, and power accessories. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Describe the theory and operation of automotive electrical and electronic systems.
- Explain general electrical and electronic system principles to include the relationship between volts, amperes, and ohms.
- Explain battery systems and their relationship to electronic systems.
- Explain starting and charging systems.
- Identify components of automotive electrical systems.
- Explain lighting and driver information systems.
- Recognize electronic principles and how they relate to particular automotive systems.
- Identify typical electrical and electronic system failures.
- SLO 2: Diagnose automotive electrical and electronic concerns.

- Prepare and write repair orders to include: customer information, vehicle identifying information, customer concerns, related service history, cause, and correction.
- Research applicable vehicle and service information, such as electrical and electronic system operation, system specifications, technical service bulletins, vehicle service history, and service precautions.
- Explain the proper use of technical service publications used in diagnostic procedures.
- Recall and apply step-by-step diagnostic procedures.
- Apply the use of scan-tools and digital multi-meters (DMM) accurately.
- Perform road tests or system self-tests to verify the customer's concern.
- SLO 3: Repair automotive electrical and electronic systems.
- Perform the necessary repair procedure for electrical and electronic circuit faults.
- Perform disassembly, inspection, testing, and reassembly of automotive electronic and electrical systems.
- Identify and apply the use of special tools necessary to repair automotive electrical and electronic systems.
- Verify the outcome of the repair through a test drive analysis or system self-test.

AMT 372 Ford ASSET Automotive Brake Systems

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	None.
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program. Some training materials utilized in this course require access to restricted Ford Motor Company websites obtained via enrollment in the Ford Automotive Student Service Education Training (ASSET) program and establishment of a Ford/Lincoln dealership sponsorship.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course covers the theory, diagnosis, and repair of automotive brake systems, including anti-lock braking systems (ABS). Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the theory and operation of automotive brake systems.
- Identify the purpose of conventional and anti-lock braking systems and components.
- Explain the basic theory and operation of conventional and anti-lock braking systems and components.
- Analyze the effects of basic physics principles on brake system operation, to include: inertia, weight transfer, friction, leverage, hydraulics, and energy conversions.

- List safety concerns related to hazardous materials.
- SLO 2: Demonstrate the ability to diagnose automotive brake systems.
- Demonstrate the ability to write repair orders to include: customer information, vehicle identifying information, customer concern, related service history, cause and correction.
- Research applicable vehicle and service information, such as engine management system operation, type of braking systems, vehicle service history, service precautions, and technical service bulletins.
- Identify and explain the proper use of service information used in the diagnostic procedure.
- Demonstrate the ability to follow step-by-step diagnostic procedures.
- Demonstrate proper use of diagnostic equipment.
- Perform a road test analysis to verify the customer concern.
- SLO 3: Demonstrate the ability to repair automotive brake systems.
- Perform removal and replacement of brake system components.
- Analyze component condition through inspection and measurement and determine the appropriate repair.
- Perform hydraulic system bleeding procedures including anti-lock braking (ABS) bleeding.
- Clean, inspect, service, and adjust brake components according to manufacturer's procedures.
- Demonstrate the proper use of special tools and equipment needed for brake service.
- Perform a road test analysis to verify the effectiveness of the repair procedure.

AMT 374 Ford ASSET Automotive Suspension and Steering

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 371 with a grade of "C" or better
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Transferable:	CSU
Catalog Date:	June 1, 2019

Cookies Disclaimer ✕

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course covers theory, diagnosis, and repair of automotive steering and suspension systems. Wheels, tires, and related systems will also be discussed, including power steering systems and electronically controlled steering and suspension systems. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Describe the purpose of automotive suspension and steering systems.
- Identify the components of the suspension system.

- Explain the operation of the suspension system.
- Identify the components of various steering systems to include manual systems, hydraulic power steering systems, and electronic power steering systems.
- Explain the operation of various steering systems to include manual systems, hydraulic power steering systems, and electronic power steering systems.
- Describe fluid dynamics as it relates to steering and suspension systems.
- SLO 2: Diagnose automotive suspension and steering concerns.
- Prepare draft work orders to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Perform mechanical diagnosis of suspension and steering systems as described in service publications.
- Perform electronic diagnosis of suspension and steering systems as described in service publications.
- Perform noise, vibration, and harshness diagnosis caused by suspension and steering components not within specifications.
- SLO 3: Assess and repair suspension and steering systems.
- Perform disassembly and reassembly of suspension and steering components.
- Select, service, and replace suspension and steering components based upon inspection and measurements using manufacturer's specifications and procedures.
- Verify repair utilizing a test drive analysis.
- Apply proper safety practices as outlined in service publications.
- List safety concerns related to hazardous materials with regards to hazardous materials regulations.

AMT 375 Ford ASSET Automotive Wheel Alignment

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 371 with a grade of "C" or better
Corequisite:	AMT 374
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course covers various automotive wheel alignment equipment and procedures. Wheel alignment diagnosis and repair will be performed as well as maintenance and repair of related systems. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Describe the purpose of steering and suspension system alignment angles and procedures
- Identify the purpose of caster, camber, and toe adjustments and their relationships to one another
- Identify proper alignment procedures and equipment usage
- Inspect vehicle for available adjustments to alignment angles
- Explain effects of the various alignment angles on vehicle stability and tracking, tire wear, and vehicle safety
- SLO 2: Diagnose concerns caused by incorrect wheel alignment
- Prepare a work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction
- Explain the proper use of technical service publications used in the diagnostic procedure
- Perform mechanical diagnosis of alignment angles utilizing appropriate equipment
- Utilize abnormal tire tread wear patterns to identify wheel alignment concerns
- Perform noise, vibration, and harshness diagnosis to include wheel and tire balancing and road force variation measurements
- SLO 3: Adjust vehicle wheel alignment angles to proper specifications
- Perform pre-alignment inspection and safely prepare vehicle for wheel alignment procedures
- Select, service, and replace alignment components based upon inspection and measurements and manufacturer's specifications
- Identify specialized procedures or components necessary to obtain proper wheel alignment and prepare vehicle accordingly
- Demonstrate proper safety practices as outlined in service publications
- Demonstrate the proper use of special tools as directed in service publications
- List safety concerns related to hazardous materials with regards to hazardous materials regulations

AMT 376 Ford ASSET Automotive Heating and Air Conditioning

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 371 with a grade of "C" or better
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course covers the theory, diagnosis, and repair of automotive heating and air conditioning systems, including air management sub-systems and an overview of engine cooling systems. Proper handling of common automotive refrigerants in accordance with EPA regulations will also be covered. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the basic operation of automotive heating, ventilation, and air conditioning (HVAC) systems
- Explain relationships between temperature and pressure
- Identify components of automotive heating and engine cooling systems
- Explain the operation of automotive heating and engine cooling systems
- Identify components of automotive air conditioning systems
- Explain the operation of automotive air conditioning systems
- Explain the characteristics and associated safety hazards of typical automotive refrigerants used in air conditioning systems in accordance with EPA regulations
- Identify special tools and equipment used in HVAC diagnosis, repair, and maintenance
- SLO 2: Diagnose automotive heating, ventilation, and air conditioning (HVAC) system concerns
- Prepare the vehicle for HVAC system performance testing
- Perform visual and touch procedures to diagnose the HVAC system
- Identify refrigerant used in the HVAC system
- Perform mechanical diagnosis of the HVAC system to include pressure testing, analyzing gauge readings, and monitoring compressor cycling times
- Perform electronic diagnosis of the HVAC system
- Explain the proper use of technical service information
- SLO 3: Repair automotive heating, ventilation, and air conditioning (HVAC) systems
- Perform refrigerant service to include refrigerant identification, recovery, evacuation, vacuum testing, and charging
- Identify and replace faulty components in the A/C system using industry accepted practices
- Identify and replace faulty components in the heating and engine cooling system using industry accepted practices
- Verify the effectiveness of the repair via HVAC system performance testing

AMT 378 Ford ASSET Automatic Transmissions/Transaxles

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 371 with a grade of "C" or better
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course covers the theory, diagnosis, and repair of automatic transmissions and transaxles. Proper maintenance and service will also be covered. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the theory and operation of automatic transmissions and transaxles.
- Explain the purpose and role of torque in the drive train.
- Explain the relationship between torque, speed and gear ratios.
- Identify the components in automatic transmissions and transaxles.
- Explain the operation of torque converters.
- Explain hydraulic principles as they apply to automatic transmissions and transaxles.
- Identify various types of automatic transmissions and transaxles.
- Explain the principles of electrical and electronic systems as they apply to automatic transmissions and transaxles.
- Explain the flow of power through automatic transmissions and transaxles.
- SLO 2: Demonstrate the ability to diagnose automatic transmissions and transaxles.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Perform mechanical testing of automatic transmission and transaxle concerns to evaluate component condition and/or system operation.
- Perform hydraulic testing of automatic transmission and transaxle concerns to evaluate component condition and/or system operation.
- Perform electronic testing of automatic transmission and transaxle concerns to evaluate component condition and/or system operation.
- Utilize clutch and band application charts to diagnose automatic transmission and transaxle concerns.
- Utilize solenoid operation charts to diagnose automatic transmission and transaxle concerns.
- SLO 3: Demonstrate the ability to service and repair automatic transmissions and transaxles.
- Demonstrate an understanding of proper automatic transmission maintenance and service.
- Perform disassembly and reassembly of automatic transmissions and transaxles.
- Demonstrate the use of special tools necessary to repair automatic transmissions and transaxles.

- Select, service, and replace automatic transmission and transaxle components based upon inspection and measurement using manufacturer's specifications and procedures.

AMT 379 Ford ASSET Automotive Engine Repair

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 371 with a grade of "C" or better
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course covers the theory, diagnosis, and repair of automotive engines. Proper maintenance and service will also be covered. Complete engine overhaul procedures will be examined, but the primary focus will be on typical engine repairs. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the basic components and operation of automotive engines.
 - Explain the four stroke (Otto) cycle.
 - Explain the relationship of the various mechanical components within the engine.
 - Explain various ways in which engines are classified (cylinder layout, number of strokes, fuel, ignition source, etc.).
- SLO 2: Diagnose engine mechanical concerns and conduct diagnostic testing procedures.
 - Perform engine noise diagnosis.
 - Perform basic engine mechanical diagnostic procedures.
- SLO 3: Perform the procedures and techniques involved in typical engine repairs and overhauls.
 - Disassemble, clean, inspect, and measure all components of the engine.
 - Demonstrate an understanding of machining operations performed on the engine block and cylinder heads to restore parts to manufacturer's specifications.
 - Select, service, and replace engine components based upon inspection and measurement and manufacturer's specifications.
 - Service camshaft timing mechanism components on various engines.
 - Reassemble the engine.
 - Demonstrate an understanding of proper engine installation, start-up, and break-in procedures.

AMT 381 Ford ASSET Electronic Engine Control

Units:	4
Hours:	63 hours LEC; 27 hours LAB
Prerequisite:	AMT 371 with a grade of "C" or better
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course is a study of Ford Electronic Engine Control systems, their components, and their relationship to other vehicle systems. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the theory and operation of automotive electronic engine control (EEC) systems and their components.
- Explain the four basic computer functions: Input, Processing, Storage, and Output.
- Explain the theory and operation of various EEC inputs (sensors) to include switches, thermistors, potentiometers, speed/position sensors, pressure sensors, oxygen sensors, and mass air flow sensors.
- Explain the theory and operation of automotive computers and control modules.
- Explain the theory and operation of various EEC outputs (actuators) to include solenoids, relays, motors, and lights.
- Explain the relationship between various EEC components as it relates to the concept of a feedback loop.
- Explain the theory and operation of automotive computer and control module multiplexing and networking systems.
- SLO 2: Diagnose automotive electronic engine control (EEC) systems and their components.
- Retrieve diagnostic trouble codes and related data using a scan tool.
- Monitor and analyze parameter identification data using a scan tool.
- Analyze the status of on board diagnostic inspection and maintenance monitors.
- Perform electronic diagnostic testing using manufacturer's specifications and procedures.
- SLO 3: Demonstrate the ability to repair automotive electronic engine control (EEC) systems and their components.
- Select, service and repair components of the EEC system using manufacturer's specifications and procedures.
- Demonstrate an understanding of proper module replacement and programming procedures.
- Perform an on board diagnostics drive cycle and analyze the results to verify the effectiveness of a repair.

AMT 382 Ford ASSET Gasoline Engine Performance

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 371 with a grade of "C" or better
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course offers a thorough examination of basic gasoline engine performance systems to include ignition systems, fuel systems, and emission controls. System maintenance, diagnosis, and repair will also be covered, including the use of specialized test equipment. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the theory and operation of gasoline engine performance systems and their components.
- Explain the theory and operation of automotive ignition systems to include distributor ignition, waste spark, and coil on plug systems.
- Explain the theory and operation of electronic fuel injection systems to include throttle body injection, port fuel injection, and gasoline direct injection.
- Explain the theory and operation of automotive emission control systems to include catalytic converters, positive crankcase ventilation, evaporative emissions, and exhaust gas recirculation systems.
- SLO 2: Diagnose gasoline engine performance systems and their components.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Perform diagnosis of ignition system concerns using scan tool data and related test equipment.
- Perform diagnosis of electronic fuel injection system concerns using scan tool data and related test equipment.
- Perform diagnosis of emission control system concerns using scan tool data and related test equipment.
- SLO 3: Demonstrate the ability to service and repair gasoline engine performance systems and their components.
- Demonstrate an understanding of proper ignition system maintenance and service.
- Demonstrate an understanding of proper electronic fuel injection system maintenance and service.
- Demonstrate an understanding of proper emission control system maintenance and service.
- Perform removal and replacement of automotive ignition system components.
- Perform removal and replacement of electronic fuel injection system components.
- Perform removal and replacement of emission control system components.
- Perform adjustments as necessary to gasoline engine performance systems and their components.
- Demonstrate the use of special tools necessary to repair gasoline engine performance systems and their components.
- Select, service, and replace gasoline engine performance system components based upon inspection and measurement using manufacturer's specifications and procedures.

AMT 383 Ford ASSET Advanced Gasoline Engine Performance

Units:	3
Hours:	36 hours LEC; 54 hours LAB
Prerequisite:	AMT 371 with a grade of "C" or better
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course offers an advanced analysis of gasoline engine performance systems to include ignition systems, fuel systems, and emission controls. New technologies and advances in these systems will be highlighted. This course places emphasis on advanced diagnostic techniques, use of specialized test equipment, and diagnostic strategies to be utilized when standard manufacturer's procedures are unable to properly diagnose or repair the vehicle. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the theory and operation of advanced gasoline engine performance systems and their components.
- Explain the advanced theory and operation of automotive ignition systems to include spark duration, peak kV, and secondary ignition pattern analysis.
- Explain the advanced theory and operation of electronic fuel injection systems to include injection timing strategies, piezoelectric injectors, return-less fuel systems, and low and high pressure fuel delivery/injection systems.
- Explain the advanced theory and operation of automotive emission control systems to include universal exhaust gas oxygen (wideband air/fuel ratio) sensors, variable camshaft timing systems, and electronic throttle control.
- SLO 2: Diagnose intermittent and advanced gasoline engine performance system concerns.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Perform diagnosis of advanced ignition system concerns using oscilloscope patterns, spark duration data, and Mode 6 data.
- Perform diagnosis of advanced electronic fuel injection system concerns using fuel injector balance testing (relative injector flow), oscilloscope patterns, and oxygen sensor data.
- Perform diagnosis of advanced emission control system concerns using scan tool data, oscilloscope patterns, breakout boxes, and related test equipment.
- Perform diagnosis of intermittent drivability concerns.
- Perform diagnosis of drivability concerns that do not result in a diagnostic trouble code.
- Utilize critical thinking to develop and execute a diagnostic strategy when manufacturer's procedures fail to properly diagnose and repair the vehicle.
- SLO 3: Demonstrate the ability to service and repair advanced gasoline engine performance systems and their components.

- Demonstrate an understanding of proper gasoline engine performance system maintenance and service.
- Perform removal and replacement of gasoline engine performance system components.
- Perform adjustments as necessary to gasoline engine performance systems and their components.
- Demonstrate the use of special tools necessary to repair gasoline engine performance systems and their components.
- Select, service, and replace gasoline engine performance system components based upon inspection and measurement using manufacturer's specifications and procedures.

AMT 385 Ford ASSET Automotive Manual Drive Train and Axles

Units:	1.5
Hours:	18 hours LEC; 27 hours LAB
Prerequisite:	AMT 371 with a grade of "C" or better
Enrollment Limitation:	Students taking this course must be enrolled in the Ford Automotive Student Service Education Training (ASSET) program due to prerequisite Ford Motor Company training requirements.
Transferable:	CSU
Catalog Date:	June 1, 2019

This course is offered to students enrolled in the Ford Automotive Student Service Education Training (ASSET) program. This course covers the theory, diagnosis, and repair of clutches, manual transmissions and transaxles, transfer cases, drive lines, and differentials. Proper maintenance and service will also be covered. Students who successfully complete this course may be eligible for Ford Service Technician Specialty Training (STST) certification.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Understand the theory and operation of manual transmissions and transaxles and drive train components to include: clutches, transfer cases, drive shafts, and differential assemblies.
- Explain the purpose and role of torque in the drive train.
- Explain the relationship between torque, speed and gear ratios.
- Identify the components in manual transmissions and transaxles.
- Identify the components of transfer cases, clutches, drive shafts, and axle assemblies.
- Explain the flow of power through manual transmissions and transaxles.
- Explain the flow of power through clutches and axle assemblies.
- SLO 2: Demonstrate the ability to diagnose manual transmissions, transaxles, and drive train concerns.
- Explain the proper use of technical service publications used in the diagnostic procedure.
- Perform noise diagnosis of manual transmissions, transaxles, and drive train components.
- Perform vibration diagnosis of manual transmissions, transaxles, and drive train components.
- Perform mechanical diagnosis of manual transmissions, transaxles, and drive train components.
- SLO 3: Demonstrate the ability to repair manual transmissions, transaxles, and drive train concerns.

- Perform disassembly and reassembly of manual transmissions.
- Perform disassembly and reassembly of manual transaxles.
- Perform disassembly and reassembly of transfer cases.
- Perform disassembly and reassembly of differentials.
- Select, service, and replace drive train components based upon inspection and measurement and manufacturer's specifications.

AMT 495 Independent Studies in Automotive Mechanics Technology

Units:	1 - 3
Hours:	54 - 162 hours LAB
Prerequisite:	None.
Transferable:	CSU
Catalog Date:	June 1, 2019

An independent studies project involves an individual student or small group of students in study, research, or activities beyond the scope of regularly offered courses. See the current catalog section of "Special Studies" for full details of Independent Studies.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Actively engage in intellectual inquiry beyond that required in order to pass a course of study (College Wide Learning Outcome – Area 4).
- Discuss and outline a proposal of study (that can be accomplished within one semester term) with a supervising instructor qualified within the discipline.
- Design an independent study (to be completed individually or by collaboration of a small group) to foster special knowledge, skills, and experience that are not available in any one regularly scheduled course.
- Use information resources to gather discipline-specific information.
- SLO #2: Utilize modes of analysis and critical thinking to apply theoretical perspectives and/or concepts in the major discipline of study to significant problems and/or educational activities (College Wide Learning Outcome – Area 3).
- Analyze and apply the knowledge, skills and experience that are involved in the independent study to theoretical perspectives and/or concepts in the major discipline of study.
- Explain the importance of the major discipline of study in the broader picture of society.
- SLO #3: Communicate a complex understanding of content matter of the major discipline of study (College Wide Outcome – Area 3).
- Demonstrate competence in the skills essential to mastery of the major discipline of study that are necessary to accomplish the independent study.
- SLO #4: Identify personal goals and pursue these goals effectively (College Wide Outcome – Area 4).

- Utilize skills from the “academic tool kit” including time management, study skills, etc., to accomplish the independent study within one semester term.

AMT 498 Work Experience in Automotive Mechanics Technology

Units:	1 - 4
Hours:	60 - 300 hours LAB
Prerequisite:	None.
Enrollment Limitation:	Students must be in a paid or unpaid internship, volunteer position or job related to career goals in Automotive Mechanics Technology.
Transferable:	CSU
General Education:	AA/AS Area III(b)
Catalog Date:	June 1, 2019

This course provides students with opportunities to develop marketable skills in preparation for employment in their major field of study or advancement within their career. It is designed for students interested in work experience and/or internships in transfer level degree occupational programs. Course content includes understanding the application of education to the workforce; completion of required forms which document the student's progress and hours spent at the work site; and developing workplace skills and competencies. Appropriate level learning objectives are established by the student and the employer. During the semester, the student is required to participate in a weekly orientation and 75 hours of related paid work experience, or 60 hours of unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. Work Experience may be taken for a total of 16 units when there are new or expanded learning objectives. Only one Work Experience course may be taken per semester.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- DEMONSTRATE AN UNDERSTANDING AND APPLICATION OF PROFESSIONAL WORKPLACE BEHAVIOR IN A FIELD OF STUDY RELATED TO ONE’S CAREER.(SLO 1)
- Understand the effects time, stress, and organizational management have on performance.
- Demonstrate an understanding of consistently practicing ethics and confidentiality in a workplace.
- Examine the career/life planning process and relate its relevancy to the student.
- Demonstrate an understanding of basic communication tools and their appropriate use.
- Demonstrate an understanding of workplace etiquette.
- DESCRIBE THE CAREER/LIFE PLANNING PROCESS AND RELATE ITS RELEVANCY TO ONE'S CAREER.(SLO 2)
- Link personal goals to long term achievement.
- Display an understanding of creating a professional first impression.
- Understand how networking is a powerful job search tool.
- Understand necessary elements of a résumé.
- Understand the importance of interview preparation.
- Identify how continual learning increases career success.

- DEMONSTRATE APPLICATION OF INDUSTRY KNOWLEDGE AND THEORETICAL CONCEPTS AS WRITTEN IN LEARNING OBJECTIVES IN PARTNERSHIP WITH THE EMPLOYER WORK SITE SUPERVISOR.(SLO 3)

Faculty

Drew Carlson
Automotive Technology Professor

Office: CRC Main, WINN, 215Q
Email: carlsow@crc.losrios.edu
(<mailto:carlsow@crc.losrios.edu>)
Phone: (916) 691-7638
Web: [Drew Carlson's Profile Page \(/about-us/contact-us/faculty-and-staff-directory/drew-carlson\)](#)

Charles Korn
Adjunct Automotive Professor

Office: CRC Main, WINN, 111
Email: kornc@crc.losrios.edu
(<mailto:kornc@crc.losrios.edu>)
Phone: (916) 691-7200
Web: [Charles Korn's Profile Page \(/about-us/contact-us/faculty-and-staff-directory/charles-korn\)](#)

John McCollum
Adjunct Automotive Professor

Office: CRC Main, WINN, 111
Email: mccollj@crc.losrios.edu
(<mailto:mccollj@crc.losrios.edu>)
Phone: (916) 691-7200
Web: [John McCollum's Profile Page \(/about-us/contact-us/faculty-and-staff-directory/john-mccollum\)](#)

Brian Noel
Automotive Technology Professor, Ford ASSET

Office: CRC Main, T, 105
Email: noelb@crc.losrios.edu
(<mailto:noelb@crc.losrios.edu>)
Phone: (916) 691-7287
Web: [Brian Noel's Profile Page \(/about-us/contact-us/faculty-and-staff-directory/brian-noel\)](#)

Michael Pereira
Automotive Technology Professor, Ford ASSET

Office: CRC Main, T, 103
Email: pereirm@crc.losrios.edu
(<mailto:pereirm@crc.losrios.edu>)
Phone: (916) 691-7177
Web: [Michael Pereira's Profile Page \(/about-us/contact-us/faculty-and-staff-directory/michael-pereira\)](#)

Kevin Rogers
Automotive Technology Professor

Office: CRC Main, T, 101
Email: rogersk@crc.losrios.edu
(<mailto:rogersk@crc.losrios.edu>)
Phone: (916) 691-7209
Web: [Kevin Rogers's Profile Page \(/about-us/contact-us/faculty-and-staff-directory/kevin-rogers\)](#)

Jeffrey Smith
Adjunct Automotive Professor

Office: CRC Main, WINN, 111
Email: smithj@crc.losrios.edu
(<mailto:smithj@crc.losrios.edu>)
Phone: (916) 691-7200
Web: [Jeffrey Smith's Profile Page \(/about-us/contact-us/faculty-and-staff-directory/jeffrey-smith\)](#)

Alex Szeto
Adjunct Automotive Professor

Office: CRC Main, WINN, 111
Email: szetoa@crc.losrios.edu
(<mailto:szetoa@crc.losrios.edu>)
Phone: (916) 691-7200
Web: [Alex Szeto's Profile Page \(/about-us/contact-us/faculty-and-staff-directory/alex-szeto\)](#)

Brandon Zehnder
Adjunct Automotive Professor

Office: CRC Main, WINN, 111
Email: zehndeb@crc.losrios.edu
(<mailto:zehndeb@crc.losrios.edu>)

Phone: (916) 691-7200
Web: [Brandon Zehnder's Profile Page \(/about-us/contact-us/faculty-and-staff-directory/brandon-zehnder\)](#)

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