

AUTOMOTIVE TECHNOLOGY (AUTO)

099 INTRODUCTION TO AUTOMOTIVE TECHNOLOGY 3 UNITS

C-ID AUTO 110X

3 hours lecture

This course presents basic information about automotive systems. Serves as a recommended preparation course for students interested in the Automotive Technology major.

CSU

100 INTRODUCTION TO AUTOMOTIVE TECHNOLOGY LAB 1 UNIT

C-ID AUTO 110X

3 hours laboratory

Basic laboratory environment designed to prepare students for entry into the Automotive Technology major. Covers repairing, servicing and basic diagnostic procedures of a typical passenger car or light truck.

CSU

120 ENGINE PERFORMANCE I - MECHANICAL AND IGNITION SYSTEMS 5 UNITS

Prerequisite: "C" grade or higher or "Pass" in AUTO 099 or 100 or equivalent or concurrent enrollment

3 hours lecture, 6 hours laboratory

First in a three course series dealing with engine performance. Begins with a review of basic engine mechanical systems and an introduction to vehicle emissions and computer scanners, followed by a detailed study of current ignition systems. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Initial preparation for ASE Engine Performance (A-8) Certification.

CSU

122 AUTOMOTIVE ELECTRICAL SYSTEMS 5 UNITS

3 hours lecture, 6 hours laboratory

Basic principles of electricity as applied to automobiles. Comprehensive investigation of automotive electrical systems including periodic maintenance, diagnosis, component servicing and adjustment. Students will be expected to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-6 Certification.

CSU

123 ENGINE PERFORMANCE II - EMISSION SYSTEMS 5 UNITS

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 120 or equivalent, AUTO 122 or equivalent, AUTO 127 or equivalent

3 hours lecture, 6 hours laboratory

This is the second in a three course series demonstrating engine performance, applied electronics, and emission systems. AUTO 123 emphasizes the use of computers for the control of fuel and air delivery to the diesel or gasoline engine. Topics include: input and output devices, computer operation, closed loop fuel control, computer-controlled fuel injection, forced air injection, scan tool diagnostics, digital lab scope diagnostics, and on board diagnostics (OBD). Students will be required to complete associated tasks in the laboratory specified by NATEF (National Automotive Training Educational Foundation). This course prepares students for ASE: A-6 electrical, A-8 engine performance, and L1 advanced engine performance certification tests, and also satisfies California Bureau of

Automotive Repair Specified Repair Training for emissions licensing.

CSU

124 ENGINE PERFORMANCE III - DRIVABILITY 5 UNITS

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 123 or equivalent

3 hours lecture, 6 hours laboratory

The capstone course in a three course engine performance series. Students will utilize skills developed in the first two courses to perform drivability diagnostics on all related engine systems. Emphasis on advanced application of scan tools and digital storage oscilloscopes (DSO) in the diagnosis of hard to find system problems, especially intermittent concerns. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE Advanced Engine Performance (L-1) Certification.

CSU

127 ADVANCED AUTOMOTIVE ELECTRICAL SYSTEMS 5 UNITS

Prerequisite: "C" grade or higher or "Pass" in AUTO 122 or equivalent

3 hours lecture, 6 hours laboratory

Advanced course in electrical systems designed to develop greater student performance under simulated industry conditions. Students will be expected to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-6 Certification.

CSU

129 INTRODUCTION TO HYBRID, ELECTRIC AND ALTERNATIVE FUELED VEHICLES 5 UNITS

C-ID ALTF 100X

3 hours lecture, 6 hours laboratory

Introductory course in the study of hybrid, electric, alternative fuels and their delivery systems for automotive and light trucks. The main focus is on hybrid vehicles; additionally, electric and alternative fueled vehicles will be covered to include alcohol, diesel, CNG (Compressed Natural Gas) and LPG (Liquefied Petroleum Gas) systems. Fuel cell technologies will be discussed. Topics include environmental and political concerns, pros and cons of various alternative fuels, and hybrid and electric options. Proper safety procedures for CNG, LPG, hybrid, electric and diesel systems will be emphasized. The properties, chemical structure, and safety concerns of various alternative fuels will be stressed. Electrical/electronic diagnosis of the various systems will be covered in detail with specific case studies on live vehicles. Students are recommended to have a working knowledge of automotive electricity, drivability diagnosis, and automotive computer systems.

CSU

130 AUTOMOTIVE BRAKES AND BRAKE LICENSE 5 UNITS

C-ID AUTO 150X

3 hours lecture, 6 hours laboratory

Detailed study of automotive brake system service procedures. Laboratory experience covers drum and disc brake system inspection, adjustment and repair procedures, and antilock brake systems. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for State of California Official Brake Adjusters License and ASE A-5 Certification.

CSU

135 ADVANCED BRAKES 5 UNITS

Prerequisite: "C" grade or higher or "Pass" in AUTO 130 or equivalent

3 hours lecture, 6 hours laboratory

Advanced course in automotive brake systems emphasizing diagnosis. Designed to develop greater student performance under simulated industry conditions. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for State of California Official Brake Adjusters License and ASE A-5 Certification.

CSU

140 FOUR WHEEL ALIGNMENT 5 UNITS

C-ID AUTO 140X

3 hours lecture, 6 hours laboratory

Four wheel alignment principles as applied to checking and correcting alignment settings. Repair and replacement of suspension components, computerized steering and ride controls. Additional training in wheel balancing. Emphasis on practical experience on "live" automobiles. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-4 Certification.

CSU

141 EMISSION CONTROL LICENSE FUNDAMENTALS

LEVEL I INSPECTOR TRAINING 3 UNITS

Recommended Preparation: AUTO 120, AUTO 122, AUTO 123, AUTO 124

2 hours lecture, 3 hours laboratory

Theory of operation and inspection of emission control devices with strong emphasis on federal and state laws and regulations required for licensing and testing of vehicles. This course demonstrates the most current testing devices used for inspection procedures, and is approved by the State of California Bureau of Automotive Repair (BAR). This course is designed to prepare a student to take the BAR Inspector Only (I.O.) licensing examination. Experienced candidates may skip Level I training if they possess: ASE A6, A8, and L1 certification; or an AA/AS degree or Certificate in Automotive Technology and have 1 year experience; or have 2 years of experience and have completed BAR specified diagnostic and repair training, AUTO 123 Engine Performance II Vehicle Emissions Systems.

142 EMISSION LICENSE PROCEDURES LEVEL II INSPECTOR TRAINING 2 UNITS

Recommended Preparation: AUTO 120, 122, 123, 124, 127, 141. Completion of all California Bureau of Automotive Repair web based training modules.

1 hour lecture, 3 hours laboratory

The Smog Check Procedures training must be completed by all Inspector candidates. This training provides students the procedural knowledge skills and abilities to perform emission inspections. Students who complete this training will have met the State of California Bureau of Automotive Repair training requirements to qualify to take the Smog Inspector state licensing examination. To pass level II training students must pass a series of hands on assessments and pass a written examination. This course is designed for experienced students who possess ASE A6, A8, and L1 certification; or possess an AA/AS degree or Certificate(s) in automotive technology and have 1 year experience; or have 2 years of experience and have completed BAR specified diagnostic and repair training Engine Performance AT 123.

145 ADVANCED FOUR WHEEL**ALIGNMENT****5 UNITS**

Prerequisite: "C" grade or higher or "Pass" in AUTO 140 or equivalent

3 hours lecture, 6 hours laboratory

Advanced course in four wheel alignment emphasizing diagnosis and complete suspension system repair. Designed to develop greater student performance under simulated industry conditions. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-4 Certification.

CSU

152 DRIVE TRAIN SYSTEMS**4 UNITS**

2.5 hours lecture, 4.5 hours laboratory

In-depth study of hydraulic power transmission and control systems used in automatic transmissions including diagnosis and overhaul of actual transmissions to precise industry standards. Plus, theory of operation, diagnosis, repair and overhaul of manual transmissions, clutches, drivelines and differentials including four wheel drive and front wheel drive. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-2 and A-3 Certification.

CSU

155 ADVANCED DRIVE TRAIN SYSTEMS**4 UNITS**

Prerequisite: "C" grade or higher or "Pass" in AUTO 152 or equivalent

2.5 hours lecture, 4.5 hours laboratory

Advanced course in power drive systems emphasizing advanced diagnosis and repair of drive train systems and components. Designed to develop greater student performance under simulated industry conditions. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-2 and A-3 Certification.

CSU

160 AIR CONDITIONING AND HEATING SYSTEMS**3 UNITS****C-ID AUTO 170X**

2 hours lecture, 3 hours laboratory

Study of refrigeration principles with emphasis on servicing, diagnosing, testing and repair or replacement of components. Emphasis on practical experience performing actual repairs. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-7 Certification and EPA-approved CFC Technician Certification.

CSU

165 ADVANCED AIR CONDITIONING AND HEATING SYSTEMS**3 UNITS**

Prerequisite: "C" grade or higher or "Pass" in AUTO 160 or equivalent

2 hours lecture, 3 hours laboratory

Advanced course in automotive environmental control systems emphasizing advanced diagnosis and repair. Designed to develop greater student performance under simulated industry conditions. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-7 Certification.

CSU

170 ENGINE OVERHAUL**5 UNITS**

3 hours lecture, 6 hours laboratory

Diagnosis of engine failures, engine removal and disassembly techniques, engine cleaning and measuring practices, machining principles, and assembly procedures. Emphasis is on practical experience through actual shop training. Students are required to provide an auto engine for overhaul and complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-1 Certification.

CSU

175 ADVANCED ENGINE OVERHAUL**5 UNITS**

Prerequisite: "C" grade or higher or "Pass" in AUTO 170 or equivalent

3 hours lecture, 6 hours laboratory

Advanced course in engine overhaul designed to develop greater student performance under simulated industry conditions. Students will be required to complete associated tasks in the shop as specified by NATEF (National Automotive Training Educational Foundation). Preparation for ASE A-1 Certification.

CSU

176 ENGINE MACHINING**5 UNITS**

Prerequisite: "C" grade or higher or "Pass" in AUTO 175 or equivalent

3 hours lecture, 6 hours laboratory

Third course in the engine repair sequence. Students must have credit in engine overhaul and advanced engine overhaul prior to enrolling in this course. Topics include cylinder boring and honing, rod resizing, replacing valve guides and seats, thread repair, king-pin fitting, replacing wheel studs, pressing bearings, etc. Preparation for employment in the automotive machine shop field, and for the ASE Engine Machinist exams.

CSU

180 AUTOMOTIVE SERVICE ADVISOR**1 UNIT**

1 hour lecture

Prepares students for working as service advisors for large independent garages or dealerships. Covers service procedures, customer relations, repair orders and warranty policies.

CSU

182 AUTOMOTIVE WORK EXPERIENCE**1-3 UNITS**

75 hours paid or 60 hours unpaid work experience per unit

Students who are employed in the automotive trade full-time or part-time (paid or unpaid) and able to work the minimum required hours during the semester are eligible to enroll in this course. Assessment of student will be performed by instructor in discussion with appropriate supervisor at place of employment. Work experience compliments classroom curriculum. *Occupational cooperative work experience credit may accrue at the rate of one to eight units per semester for a total of sixteen units, and students must work 75 paid hours or 60 unpaid hours per unit earned. This course may be elected up to five times for a maximum of 16 units.*

CSU

190 ASSET-ORIENTATION, PDI AND LUBRICATION**2 UNITS**

1 hour lecture, 3 hours laboratory

Introduction to the Ford sponsored ASSET program. Students will become familiar with dealership operations, vehicle pre-delivery inspection, and proper lubrication of the various systems of the modern automobile. Complemented by required work experience in the dealership.

CSU

191 ASSET-BRAKES, ADVANCED BRAKES, SUSPENSION AND NVH**7 UNITS**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 or AUTO 196 or equivalent

5 hours lecture, 6 hours laboratory

Ford ASSET course to include a detailed study of modern automotive braking systems and service procedures. The course will describe brake systems inspection, adjustments, and repair procedures. Vehicle dynamic electronic brake systems will be demonstrated and described. This course will require the diagnosis and replacement of mechanical and electronic suspension components, and provide training in wheel balancing and tire service. The relationship between brakes and suspension and various causes of noise vibration and harshness will be emphasized. Students will be required to gain practical experience using diagnosing and repairing vehicles. This course is complemented by required work experience at a Ford dealership.

CSU

191A ASSET-BRAKES**1 UNIT**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1 hour lecture

This Ford ASSET course includes a detailed study of modern automotive braking systems and service procedures. The course will cover drum and disc brake systems inspection, adjustment and repair procedures including methods of diagnosing and repairing various mechanical and hydraulic brake systems using Ford specified tools and procedures. This course is complemented by required work experience in the dealership where students will perform specific Ford competencies related to basic brake diagnosis and repair.

CSU

191B ASSET-BRAKES, ADVANCED BRAKES, SUSPENSION, NVH TEST OUT**.5 UNIT**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1.5 hours laboratory

Ford ASSET course to include hands on summative and criterion tests for students to prove knowledge skills and abilities to perform diagnosis and repair of active brake systems, suspension, and noise vibration and harshness (NVH) on Ford vehicles in the department laboratory; or by using distance education technologies such as augmented reality or virtual reality. The tests will include brake control systems such as hydraulics, friction heating, electronic and mechanical parking brake control systems, inputs, actuations, or other auxiliary brake systems. As well as suspension system diagnosis, and NVH diagnosis prescribed by Ford Motor Company. This course allows a student residing distance from training centers to complete Ford certification requirements prior to performing warranty service at a dealership. This course is complemented by required work experience at a Ford dealership, and by completing lecture classes brakes, advanced brakes (vehicle dynamic braking and suspension), and NVH.

CSU

191C ASSET-DYNAMIC VEHICLE**BRAKES 1.5 UNITS**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1.5 hours lecture

This Ford ASSET course includes a detailed study of modern automotive braking systems and service procedures. The course will include electronic braking systems inspection, adjustment and repair procedures including methods of diagnosing and repairing various electro mechanical and hydraulic brake systems using Ford specified tools and procedures. This course explains the high speed communication module relationship of braking, suspension, and powertrain, including active versus passive brake controls. This course is complemented by required work experience in the dealership where students will perform specific Ford competencies related to advanced brake diagnosis and repair.

CSU

191D SUSPENSION**1 UNIT**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1 hour lecture

This Ford ASSET course includes a detailed study of modern suspension systems and service procedures. This course includes inspection, adjustment, and repair procedures for suspension systems including methods of diagnosing and repairing various mechanical and hydraulic components using Ford specified tools and procedures. For example, alignments, adjustments, active suspension; and the relationship between suspension and vehicle dynamics. This course is complemented by required work experience in the dealership where students will perform specific Ford competencies related to suspension diagnosis and repair.

CSU

191E NOISE VIBRATION AND HARSHNESS**.5 UNIT**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

.5 hours lecture

This Ford ASSET course includes a detailed study of modern noise, vibration, and harshness (NVH) systems and service procedures. This course includes inspection, adjustment, and repair procedures for NVH systems including methods of diagnosing and repairing various mechanical, electronic, and hydraulic components using Ford specified tools and procedures. For example, noise is a relationship to the frequency of sound that a human can hear, and the relationship between the rotational speeds of vehicle systems. This course is complemented by required work experience in the dealership where students will perform specific Ford competencies related to NVH diagnosis and repair.

CSU

192 ASSET-DRIVE TRAIN**8 UNITS**

5.5 hours lecture, 7.5 hours laboratory

Ford ASSET course encompassing the study of modern drive train systems. Includes theory of operation, diagnosis, repair and overhaul of manual transmissions, clutches, drivelines and differentials including four wheel drive and front wheel drive. The course also includes the theory of operation, diagnosis, repair and overhaul of automatic transmissions and transaxles. Current computerized control

system operation and diagnosis of the drive train will be emphasized. Includes Ford Motor Company certification and preparation for ASE Certification. Complemented by work experience in the dealership.

CSU

192A ASSET-AUTOMATIC TRANSMISSION SERVICE**2 UNITS**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

2 hours lecture

This classroom course contains information about servicing automatic transmissions. The course topics include disassembly & inspection, subassembly, assembly, critical measurements, and unique service procedures. The course also includes the theory of and operation of automatic transaxles. Current computerized control system operation and diagnosis of the drive train will be emphasized. Successful completion includes Ford Motor Company certification and preparation for ASE Certification. This course must be complemented by work experience in the Ford dealership.

CSU

192B ASSET-TRANSMISSION DIAGNOSE AND SERVICE TEST OUT**.5 UNIT**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1.5 hours laboratory

Ford ASSET course to include hands on summative and criterion tests for students to prove knowledge skills and abilities to perform diagnosis and repair of active transmission systems including differential and four wheel drive (4WD) using Ford vehicles in the department laboratory; or by using distance education technologies such as augmented reality or virtual reality or mobile technologies. The tests will include drivetrain control systems such as hydraulics, friction clutches, electronic and mechanical transmission control systems, inputs, actuations, or other auxiliary systems prescribed by Ford Motor Company. This course allows a student residing distance from training centers to complete Ford certification requirements prior to performing warranty service at a dealership. This course is complemented by required work experience at a Ford dealership, and by completing lecture classes transmission service, transmission diagnosis, and differentials and 4WD.

CSU

192C ASSET-AUTOMATIC TRANSMISSION DIAGNOSIS**2 UNITS**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

2 hours lecture

This classroom course provides training about diagnosing automatic transmission concerns. Topics include normal operation, electrical fault diagnosis, diagnosing shift concerns, diagnosing engagement concerns, and the diagnostic process. This course is supplemented by work experience at a Ford dealership.

CSU

192D ASSET-DIFFERENTIAL AND 4WD DIAGNOSIS AND SERVICE**1 UNIT**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1 hour lecture

This Ford ASSET course includes a detailed study of modern automotive electronic or manually controlled differential and 4WD systems and service procedures. The course will describe systems inspection, adjustment and repair procedures including methods of diagnosing and repairing various mechanical and hydraulic drivetrain systems using Ford specified tools and procedures. This course is complemented by required work experience in the dealership where students will perform specific Ford competencies related to differential and 4WD diagnosis and repair.

CSU

193 ASSET-ENGINE REPAIR**4.5 UNITS**

3 hours lecture, 4.5 hours laboratory

Ford ASSET course to include diagnosis of engine failures, engine removal and disassembly techniques, engine cleaning and measuring practices, machining principles, assembly procedures and in-car repairs. Engine design theory will be discussed. Preparation for ASE Certification. Complemented by required work experience in the dealership.

CSU

193A ASSET-ENGINE DIAGNOSIS AND REPAIR**2 UNITS**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

2 hours lecture

This classroom course teaches proper disassembly, assembly, repair, and diagnostic techniques for Ford engines including the proper timing procedures. The course also includes how to identify and measure critical clearances.

CSU

193B ASSET-ENGINE DIAGNOSIS AND REPAIR TEST OUT**.5 UNIT**

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1.5 hours laboratory

Ford ASSET course to include hands on summative and criterion tests for students to prove knowledge skills and abilities to perform diagnosis and repair of engine and performance systems including diesel engine performance of Ford vehicles in the department laboratory; or by using distance education technologies such as augmented reality or virtual reality or mobile technologies. The tests will include engine component systems such as pistons, bearings, camshafts, electronic and mechanical engine control systems, inputs, actuations, or other auxiliary systems prescribed by Ford Motor Company. This course allows a student residing distance from training centers to complete Ford certification requirements prior to performing warranty service at a dealership. This course is complemented by required work experience at a Ford dealership, and by completing lecture classes engine diagnosis and repair and diesel engine performance.

CSU

193C ASSET-DIESEL ENGINE PERFORMANCE AND DIAGNOSIS 2 UNITS

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

2 hours lecture

This classroom training course will cover diesel engine performance concerns and diagnosis, which will include the use of service publications, diagnostic tests and procedures as well as special tools and equipment. The information and exercises, presented in this course, are focused on the Power-stroke diesel engines and key subsystems found on Ford vehicles.

CSU

195 ASSET-ELECTRONIC ENGINE CONTROLS 7 UNITS

5 hours lecture, 6 hours laboratory

Ford ASSET course to include an in-depth study of engine drivability and electronic engine controls on modern automobiles and trucks. Includes the study of basic and electronic ignition systems, early and modern fuel systems, and the repair and diagnosis of these systems. Emphasis is on electronic engine control system theory of operation and repair to include discussion of sensors, processors and actuators, and system diagnosis and repair. On-board computer logic and strategies will also be presented. Preparation for ASE Certification. Students who successfully complete this course will receive Ford Motor Company certification in Electronic Engine Control and Diesel Engine Performance Diagnosis.

CSU

195A ASSET-ENGINE PERFORMANCE THEORY AND OPERATION 1.5 UNITS

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1.5 hours lecture

Ford ASSET course to include an in-depth study of engine drivability and electronic engine controls on modern automobiles and trucks. Includes the study of basic and electronic ignition systems, early and modern fuel systems, and the repair and diagnosis of these systems. Emphasis is on electronic engine control system theory of operation and repair to include discussion of sensors, processors and actuators, and system diagnosis and repair. On-board computer logic and strategies will also be presented. This classroom course will provide the knowledge and skills needed to describe fundamental engine performance theory and operation. The course includes scan tool operation, PID monitoring and PC/ED usage.

CSU

195B ASSET-ENGINE PERFORMANCE DIAGNOSIS AND REPAIR TEST OUT .5 UNIT

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1.5 hours laboratory

Ford ASSET course to include hands on summative and criterion tests for students to prove knowledge skills and abilities to perform diagnosis and repair of engine performance systems including diesel engine performance of Ford vehicles in the department laboratory; or by using distance education technologies such as augmented reality or virtual reality or mobile technologies. The tests will include engine component systems such as parameter identification values (PID), inputs, actuators, or other auxiliary systems prescribed by Ford

Motor Company. This course will test student knowledge of gasoline turbo direct injection (GTDI). This course allows a student residing distance from training centers to complete Ford certification requirements prior to performing warranty service at a dealership. This course is complemented by required work experience at a Ford dealership, and by completing lecture classes engine performance and diagnosis, engine performance diagnosing and testing, and GTDI diagnosis and testing.

CSU

195C ASSET-ENGINE PERFORMANCE DIAGNOSIS AND TESTING 1.5 UNITS

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1.5 hours lecture

This classroom course will provide the knowledge and skills needed to understand engine performance diagnosis and testing. The course includes an introduction to the Symptom/System/Component/Cause (SSCC) process, pinpoint test diagnosis and specific scan tool operations.

CSU

195D GASOLINE TURBO DIRECT INJECTION 1.5 UNITS

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1.5 hours lecture

This classroom course teaches proper diagnosis and repair of the Gasoline Turbocharged Direct Injection (GTDI) engine. You will use the IDS and follow Pinpoint tests to diagnose engine-related DTC's. This course will describe turbo charging and manifold absolute pressure sensor values relating to turbo charging. The course will describe high pressure fuel system tests.

CSU

196 ASSET-ELECTRICAL, ACCESSORIES AND AIR CONDITIONING 5 UNITS

4 hours lecture, 3 hours laboratory

Ford ASSET course to include electrical systems, theory, diagnosis and repair procedures utilizing state of the art equipment. Systems covered will be storage, generating and starting. Coverage of accessory systems such as lighting, power seats, power door locks, cruise controls, electric windows, electronic dashboards, radios, windshield wipers, etc. Also covered are all major topics dealing with automotive air conditioning including refrigeration theory, system evacuation and recovery, leak repair, compressor repair, component replacement, and manual and automatic temperature control. Preparation for ASE Certification. Complemented by required work experience in the dealership.

CSU

196A ASSET-ELECTRICAL 2 UNITS

2 hours lecture

Ford ASSET course to include electrical systems, theory, diagnosis and repair procedures utilizing state of the art equipment. Systems covered will be storage, generating and starting. Coverage of accessory systems such as lighting, power seats, power door locks, cruise controls, electric windows, electronic dashboards, radios, windshield wipers, and introduction to electronic systems such as transistors and electronic computer controls. This course is supplemented with required work experience at a Ford dealership where specific competencies are performed.

CSU

196B ASSET-ELECTRICAL, ELECTRONICS, CLIMATE CONTROL TEST OUT .5 UNIT

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical or equivalent

1.5 hours laboratory

Ford ASSET course to include hands on summative and objective tests for students to prove knowledge skills and abilities to perform diagnosis and repair of electronics systems on Ford vehicles in the department laboratory, or by using distance education technologies such as augmented reality or virtual reality. The tests will include electronics systems such as lighting, power seats, power door locks, cruise controls, electric windows, electronic dashboards, radios, windshield wipers, or other systems as prescribed by Ford Motor Company. This course allows a student residing distance from training centers to complete Ford certification requirements prior to performing warranty service at a dealership. This course is complemented by required work experience at a Ford dealership, and by completing lecture class Electronics.

CSU

196C ASSET-ELECTRONICS 2 UNITS

Prerequisite: Students must have a signed Ford dealership sponsorship agreement

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

2 hours lecture

Ford ASSET course to include electronic systems, theory, diagnosis and repair procedures utilizing state of the art equipment. This course applies basic electrical test applications incorporating electronic controls units and computer networks. This course covers various vehicle computer functions such as: body electronics, infotainment systems, and electric vehicle and hybrid vehicle system operations. Students will use test equipment to measure sensor outputs used for computer component activation, and study vehicle electronic wiring diagrams in depth, gaining knowledge skills and abilities to perform complex tests. This course is preparation for Ford certification, and complemented by required work experience in the dealership.

CSU

196D ASSET-CLIMATE CONTROL 1 UNIT

Prerequisite: Students must have a signed Ford dealership sponsorship agreement

Recommended Preparation: "C" grade or higher or "Pass" in AUTO 122 Electrical or AUTO 196A Ford ASSET Electrical, or AUTO 196B Ford ASSET "TEST OUT" or equivalent

1 hour lecture

Ford ASSET course to include climate control systems, theory, diagnosis and repair procedures utilizing state of the art equipment. This course applies basic heating and air conditioning test applications incorporating electronic controls units and computer networks. This course covers various vehicle computer functions such as: body electronics, climate control units, and electric vehicle and hybrid vehicle climate system operations. Students will use test equipment to measure sensor outputs used for computer component activation, and study vehicle electronic wiring diagrams in depth, gaining knowledge skills and abilities to perform complex tests. This course is preparation for Ford certification, and complemented by required work experience in the dealership.

CSU

197 ASSET–WORK EXPERIENCE 1-3 UNITS

Prerequisite: Admission to the ASSET program
75 hours paid work experience per unit
Ford ASSET work experience. Students are responsible to attain sponsoring dealership employment before enrollment. This course is based on paid work experience at the sponsoring Ford dealership. Assessment of students will be performed by the ASSET coordinator in discussion with appropriate dealership personnel including the lead technicians, shop foreman, service manager, and student self-evaluation reflection. Students are expected to work in the content area of diagnosis and repair concurrent with the content area of instruction in order to further develop skills attained in the classroom setting. Ford certifications will not be attained without documentation completed and signed by the student and evaluators in the work experience record book. *Occupational cooperative work experience credit may accrue at the rate of one to eight units per semester for a total of sixteen units, and students must work 75 paid hours per unit earned.*

CSU

200 ASEP–ORIENTATION 1 UNIT

1 hour lecture

Introduction to the General Motors sponsored ASEP program. Students will become familiar with dealer operations. Complemented by required work experience in a dealership.

CSU

201 ASEP–ELECTRICAL 6 UNITS

4 hours lecture, 6 hours laboratory

General Motors ASEP course to include electrical systems, theory, diagnosis and repair procedures utilizing state of the art equipment. Major topics include electrical laws, batteries, starting and charging systems, wiring diagrams, and introduction to computer controls. Accessory systems such as lighting, power seats, power door locks, cruise controls, electric windows, electronic dashboards, radios, windshield wipers, etc., are also covered. Preparation for ASE and GM certification.

CSU

202 ASEP–BRAKES AND ALIGNMENT 7 UNITS

5 hours lecture, 6 hours laboratory

General Motors ASEP course to include a detailed study of modern automotive braking systems and service procedures including two and four wheel electronic anti-lock brake system operation and repair. Laboratory experience will cover drum and disc brake system inspection, adjustment and repair procedures. Also covers modern suspension and steering systems including electronic ride control, steering, and four wheel alignment principles as applied to checking and correcting alignment settings. Repair and replacement of suspension components. Additional training in wheel balancing. Emphasis on practical experience on "live" automobiles. Preparation for ASE and GM certification.

CSU

203 ASEP–ENGINE REPAIR 4.5 UNITS

3 hours lecture, 4.5 hours laboratory

General Motors ASEP course to include diagnosis of engine failures, engine removal and disassembly techniques, engine cleaning and measuring practices, machining principles and assembly procedures in car repairs. Engine design theory will be discussed. Preparation for ASE and GM certification.

CSU

204 ASEP–POWER TRAIN 7 UNITS

5 hours lecture, 6 hours laboratory

General Motors ASEP course to include an in-depth study of hydraulic power transmission and control systems used in automatic transmissions, including diagnosis and overhaul of actual transmissions to precise industry standards. Plus, theory of operation, diagnosis, repair and overhaul of manual transmissions, clutches, drivelines and differentials including four wheel drive and front wheel drive. Preparation for ASE and GM certification.

CSU

205 ASEP–ENGINE PERFORMANCE AND AIR CONDITIONING 7 UNITS

5 hours lecture, 6 hours laboratory

General Motors ASEP course to include a detailed study of electronic engine controls on modern automobiles. Emphasis is on electronic engine control system theory of operation and repair to include discussion of sensors, processors and actuators, and system diagnosis and repair. On-board computer logic and strategies will be presented. Covers all major topics dealing with automotive air conditioning including refrigeration theory, system evacuation and recovery, leak repair, compressor repair, component replacement, and manual and automatic temperature control. Preparation for ASE and GM certification.

CSU

206 ASEP–WORK EXPERIENCE 1-4 UNITS

Prerequisite: "C" grade or higher or "Pass" in AUTO 200 or equivalent

75 hours paid work experience per unit

General Motors ASEP work experience. Students will be placed with a sponsoring dealer at the start of the training program. This course is based on paid work experience at the sponsoring dealership. Assessment of students will be performed by the ASEP coordinator in discussion with appropriate dealership personnel. Students are expected to work in the area of emphasis that is concurrent with area of training most recently completed at the college in order to further develop skills attained in the classroom setting. *Must be taken for a total of 15 units.*

CSU