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. It serves as a recommended preparation course for students interested in the Automotive Technology major.  

**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 laboratory 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 120 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 will be 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 understanding of electrical 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  
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 alternate 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 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, or L1 certification; or an AA/AS degree or Certificate in Automotive Technology and have 1 year of 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 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 of 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, 3 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, ring-pin fitting, replacing wheel studs, pressing bearings, etc. Preparation for employment in the automotive machine shop field, and for the ASE Engine Machinist exam.

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
Prerequisite: Completion of a minimum of 10 units in Automotive Program. Must meet state guidelines for work experience.
5 hours paid or 4 hours unpaid work experience per week 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. Students will further develop skills attained in the classroom setting. May be taken up to 5 times for a maximum of 15 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 AND ALIGNMENT 7 UNITS
5 hours lecture, 6 hours laboratory
Ford ASSET course to include a detailed study of modern automotive braking systems and service procedures. The laboratory will cover drum and disc brake systems inspection, adjustment and repair procedures. Also covers four wheel alignment principles as applied to checking and correcting alignment settings. Repair and replacement of suspension components. Advances training in wheel balancing. Emphasis on practical experience on "live" automobiles. Preparation for ASE Certification. Complemented by required work experience in the dealership.

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

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

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

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, manual and automatic temperature control. Preparation for
ASE Certification. Complemented by required work experience in the dealership.

CSU

197 ASEP–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