

# AUTOMOTIVE (AUTO)

## **AUTO 050 F Automotive Specialty Practice 2 Units**

**Corequisite(s):** AUTO 060 F or AUTO 065 F or AUTO 070 F or AUTO 073 F or AUTO 081 F or AUTO 082 F or AUTO 083 F or AUTO 084 F or AUTO 086 F or AUTO 088 F or AUTO 089 F or AUTO 090 F or AUTO 091 F, with a grade of C or better or Pass.

18 hours lecture and 72 hours lab per term. In this course, emphasis is placed on the development and reinforcement of automotive repair skills in the area of student interest and advanced level of study. Lectures cover automotive repair procedures, service department operation, organization, support staff, repair documentation, technician certification and customer satisfaction. (Degree Credit)

## **AUTO 051 F Internship in Automotive 2-4 Units**

**Prerequisite(s):** Completion of at least two Automotive Technology courses.

18 hours lecture and 60-180 lab/unpaid internship or 75-225 hours of paid internship per term in an automotive dealership or other automotive-related facility. This course requires supervised work experience each week to earn credits above the one unit of classroom lecture. The supervised work experience is at an automotive repair facility or related automotive business and subject to NOCCCD Board of Trustee approval. This course is designed to provide learning opportunities and earned college units through internship hours in the Career Technical Education field of Automotive Technology. No more than four units total (lecture and internship) may be applied toward the degree or certificate.

## **AUTO 055 F Automotive Business Management 5 Units**

**Advisory:** AUTO 131 F with a grade of C or better or equivalent work experience.

72 hours lecture and 54 hours lab per term. This course covers the automotive service management operation associated with an automotive business and dealership. Instruction focuses on the repair order as a legal document, appointment systems, telephone skills, warranties, communication strategies, product knowledge, selling skills, proactive customer handling, and multiple ways to reduce costs and improve profits.

## **AUTO 060 F Automotive Powertrains 5 Units**

**Advisory:** AUTO 131 F or equivalent work experience.

72 hours lecture and 72 hours lab per term. This course covers the repair of rear wheel drive (RWD) manual transmissions, front wheel drive (FWD), manual transmissions, clutches, transfer cases, and differentials. Instructional emphasis is placed on the principles, theory, and operation of gears, bearings, drive lines, universal joints, CV joints, drive train electrical/electronic systems, and rear axles. The student will be assigned and perform hands-on.

## **AUTO 065 F Automotive Electrical and Electronic Systems 5 Units**

**Advisory:** AUTO 131 F or equivalent work experience.

72 hours lecture and 72 hours lab per term. This is an introductory course in the theory of electrical systems and electronic control of the modern automobile. This course covers basic electrical and electronic concepts, batteries, starting and charging systems, body computer systems, passive restraint systems, and diagnostic strategies. Instruction for this class will closely parallel topics addressed on the National Institute for Automotive Service Excellence (ASE) Electrical Systems (A6) examination.

## **AUTO 070 F Engine Reconditioning 7 Units**

**Prerequisite(s):** AUTO 081 F with a grade of C or better or equivalent work experience.

108 hours lecture and 54 hours lab per term. This course covers the operating principles, nomenclature, design, inspection, diagnostic mechanical repair procedures of automotive engines. This course offers time management, critical thinking, applied mathematics, applied physics, communication, and lifelong experiences through comprehensive and relevant laboratory projects.

## **AUTO 072 F Automotive Engine Performance 7 Units**

**Advisory:** AUTO 131 F

108 hours lecture and 54 hours lab per term. This course covers engine tune-up, diagnosis, and repair of the electronic ignition system, emissions control system, and electronic powertrain management systems, including electronic fuel injection. Instruction will be given to prepare the student for the National Institute of Automotive Service Excellence (ASE) Engine Performance (A8) test. Modern test equipment will be utilized in the lab sessions.

## **AUTO 073 F Brake Systems Repair 7 Units**

**Prerequisite(s):** AUTO 083 F with a grade of C or better or equivalent work experience.

108 hours lab and 54 hours lab per term. This course covers the operation, nomenclature, diagnosis, adjustment and repair procedures of automotive brake systems including electronically controlled anti-lock braking systems. Instruction for this class will closely parallel topics addressed on the National Institute for Automotive Service Excellence (ASE) Brakes (A5) examination.

## **AUTO 081 F Engine Rebuilding and Repair 8 Units**

**Advisory:** AUTO 131 F or equivalent work experience.

108 hours lecture and 108 hours lab per term. This course covers operating principles, nomenclature, design, and repair procedures of the modern automotive engine. Laboratory project emphasis is upon procedures of rebuilding an engine while out of the vehicle. Instruction will closely parallel topics addressed on the National Institute for Automotive Service Excellence (ASE) Engine Repair (A1) examination.

## **AUTO 082 F Engine Performance and Drivability 8 Units**

**Advisory:** AUTO 131 F

108 hours lecture and 108 hours lab per term. This course covers the operation, design, diagnosis, and repair of computerized engine management systems. Systems covered include induction, exhaust, input sensors, fuel delivery, fuel injection, ignition, and on-board diagnostics (OBD-II). Diagnostic strategies utilizing scan tools and lab scopes will be covered. Instruction will closely parallel topics addressed on the National Institute of Automotive Excellence (ASE) A8 Engine Performance examination.

## **AUTO 083 F Brake and Suspension Systems Repair 8 Units**

**Advisory:** AUTO 131 F or equivalent

108 hours lecture and 108 hours lab per term. This course covers the operation, nomenclature, adjustment and repair procedures of automotive brake, suspension, and steering systems. Instruction will closely parallel topics addressed on the National Institute for Automotive Service Excellence (ASE) Suspension and Steering (A4) and Brakes (A5) examinations. (Degree Credit)

**AUTO 084 F Automatic Transmissions****8 Units****Advisory:** AUTO 131 F or equivalent work experience.

108 hours lecture and 108 hours lab per term. This course will review the fundamentals of hydraulic systems, control valves, torque converters, planetary gear sets, clutches, bands, fluids, and filters. After this review of fundamental theory and operation, students will transition to testing, diagnosis, maintenance, and rebuilding of various types of automatic transmissions including electronically controlled transmissions and transaxles. Instruction for this class will closely parallel topics addressed on the National Institute for Automotive Service Excellence (ASE) Automatic Transmission/Transaxle (A2) Examination. Field trips may be optional outside regularly-scheduled class times. (Degree Credit)

**AUTO 086 F Automatic Transmission Fundamentals****3 Units****Advisory:** AUTO 131 F or equivalent work experience.

36 hours lecture and 54 hours lab per term. This course covers the fundamentals of hydraulic systems, control valves, torque converters, planetary gear sets, clutches, bands, fluids, and filters. Preventative maintenance and diagnostic procedures will be discussed in lecture and laboratory activities with an emphasis on rear wheel drive transmissions. Instruction will closely parallel topics addressed on the National Institute for Automotive Service Excellence (ASE) Automatic Transmission and Transaxle (A2) examination (Degree Credit).

**AUTO 088 F Fuel Systems and Advanced Drivability Diagnosis****4 Units****Advisory:** AUTO 131 F or equivalent work experience.

54 hours lecture and 54 hours lab per term. This course's instruction includes the theory and principles of carburetors, electrical systems, ignition systems, fuel injection systems, engine powertrain control systems, and the inspection and repair of automotive emission control systems. Modern diagnostic equipment including the exhaust gas analyzer, digital meters, scan tools, and digital storage oscilloscopes will be used in lab sessions. This course helps to prepare a student for The State of California Smog Check Inspector License Examination and for the National Institute for Automotive Service Excellence (ASE) A8 and L1 tests. (Degree Credit)

**AUTO 089 F Automotive Air Conditioning****4 Units****Advisory:** AUTO 131 F or equivalent work experience.

54 hours lecture and 54 hours lab per term. This course covers the theory and principles of automotive air conditioning, including service, maintenance, diagnosis and repair. Students will be given the opportunity to earn the MACS 609 Certification through proctored examination. Topics addressed on the ASE Heating and Air Conditioning Test (A7) will be emphasized. (Degree Credit)

**AUTO 090 F Emission Control Systems and Advanced Diagnosis****6 Units****Advisory:** AUTO 131 F or equivalent work experience.

90 hours lecture and 54 hours lab per term. This course's instruction includes the theory and principles of automotive ignition systems, electrical systems, emission control systems, fuel injection systems, and California Smog Inspection Procedures. Instructional emphasis is on information needed to prepare for The State of California Smog Check Inspector and/or Smog Check Repair Technician License Examinations and the National Institute for Automotive Service Excellence (ASE) A8 and L1 tests. Modern diagnostic equipment including the exhaust gas analyzer, scan tools, digital meters, and engine oscilloscopes will be used in laboratory sessions. (Degree Credit)

**AUTO 091 F Cylinder Head Repair****4 Units****Advisory:** AUTO 131 F or equivalent work experience.

54 hours lecture and 54 hours lab per term. This course covers operating principles, nomenclature, design and repair procedures of modern cylinder heads. Emphasis is on cylinder head repair procedures that are performed by automotive repair shops, including diagnosis, bench work, removal and installation.

**AUTO 096 F Performance Technology****4 Units****Advisory:** AUTO 131 F

54 hours lecture and 54 hours lab per term. This course covers the practical applications of performance and durability pertaining to motorized vehicles. Topics include areas of engine, drivelines, brakes, and suspension necessary for better performance and increased safety and durability.

**AUTO 131 F Automotive Fundamentals****4.5 Units**

72 hours lecture and 36 hours lab per term. This course emphasizes basic operating principles, nomenclature, preventative maintenance, inspection, and minor repair procedures. (Degree Credit) (CSU)