AUTOMOTIVE TECHNOLOGY
Department of Physics and Technology

ACS 10  3 lab 1 cr
Introduction to Automotive Technology
This course will introduce students to career choices in, and basic skills related to, the automotive industry. Topics covered include basic shop safety, overview of electrical principles and automotive systems and proper use of tools and diagnostic instrumentation.

Corequisites: ENG 02, RDL 02, MTH 05, if required.

ACS 11  2 rec 4 lab 4 cr
Engine Repair
A study of the modern internal combustion gasoline engine including basic principles of design and operation. This course covers disassembly, inspection and precision measuring and continues with reassembly including fitting and reconditioning parts. It also includes material covering engine support systems including cooling, lubrication and basic ignition system fundamentals and engine lubricants.

Corequisite: ACS 10

ACS 12  1 rec 4 lab 3 cr
Brake Systems
This course will study the design, operation and maintenance of the automotive brake system including diagnostics and servicing of rotors and drums, measuring and resurfacing. Anti-lock brake systems, traction control systems and front wheel drive axle shaft service are also covered.

Corequisite: ACS 10

ACS 13  2 rec 2 lab 3 cr
Engine Performance
This course begins with engine operation including conventional ignition systems and focuses on modern ignition techniques, engine, transmission and body control systems and other computer control systems. It explores modern diagnostic test techniques, equipment and procedures, and provides a thorough understanding of modern vehicle fuel control systems.

Prerequisites: ACS 11, ACS 24

ACS 14  1 rec 4 lab 3 cr
Manual Drive Train and Axle
This course covers both conventional rear-drive systems and front-drive configurations. It concentrates on transmission maintenance, service and repair, and includes drive line service and repair of clutch, ring gear and pinion, differential case assembly, drive shaft, half shaft and four wheel drive systems.

Prerequisites: ACS 11, ACS 24

ACS 21  2 rec 3 lab 3 cr
Steering and Suspension Systems
A study of the design, operating principles and service of automotive suspension and steering systems including McPherson strut and multi-link designs, solid axle and independent systems.
Tire construction, wear diagnosis and service are covered and emphasis is placed on wheel alignment procedures, including computerized four-wheel alignment. New technologies are covered including four-wheel steering, electronic steering, and computerized suspension systems.

**Prerequisites:** ACS 10, ACS 24

ACS 22  
**1 rec 6 lab 4 cr**

**Automatic Transmission and Transaxle**

This course begins with the basics of hydraulics and how they are applied to traditional automatic transmissions with rear drive vehicles and focuses on modern computer controlled transaxle applications. It includes in-car and out-of-vehicle service, maintenance, repair and adjustment using modern diagnostic techniques and equipment.

**Prerequisites:** ACS 11, ACS 24.

ACS 23  
**2 rec 3 lab 3 cr**

**Heating and Air Conditioning**

A study of vehicle climate control systems including heating and air conditioning. Includes theory, operational specifics, test procedures and service of factory and aftermarket equipment. It touches briefly on R12 system service and upgrades and focuses on 134A systems including testing, diagnosis, parts replacement and charging of A/C systems and troubleshooting electrical, electronic and mechanical heating and cooling system controls.

**Prerequisites:** ACS 10, ACS 24.

ACS 24  
**2 rec 2 lab 3 cr**

**Electrical Systems**

This course begins with the basics of electrical theory and advances through the operation of all 12 Volt systems used in the modern automobile including: storage batteries, alternator/charging systems, starter circuitry, wiring harnesses lighting and body accessories. The course places emphasis on the use of both DVOM technology and computer based diagnostics.

**Corequisite:** ACS 10

ACS 35  
**2 rec 3 lab 3 cr**

**Alternative Fuel Technology**

This course will overview alternative fuels: ethanol, methanol, compressed natural gas (CNG), liquid natural gas (LNG), propane (LPG), hydrogen, electricity (including hybrids), and fuel cells. It will explain the sources and processing of alternative fuel. It will discuss alternative fuels currently in use and under development, and compare the benefits and drawbacks of each. It will explain lean burn technology, how combustion is different with a gaseous fuel, and major policies and regulations pertaining to the installation, operation and inspection of alternate fuel vehicles.

**Prerequisite:** ACS 11

**Corequisite:** ACS 13
ACS 45  2 rec 2 lab 3 cr
Diesel Technology
This course introduces the student to diesel technology theory and operation starting with early
designs and construction but focuses mostly on modern diesel engine design and controls. It
explores modern diagnostic test techniques and provides a thorough understanding of the
importance of maintenance procedures and modern diesel engine control systems.

Prerequisites: ACS 11, ACS 24