AUTOMOTIVE (AUT)

AUT 110. Introduction to Automotive Technology. 3 Credits.
Introduction to Automotive Technology examines the role and opportunities of the automotive service professional in today's automotive industry. Shop environment, tools/equipment, and personal safety are emphasized. Students will experience typical job-entry service skills and vehicle maintenance inspections. The necessary resources providing service information are examined. An introduction of vehicle operation and support systems will be presented. This course provides the background information required to continue in the automotive technology program.

AUT 120. Performance And Diagnosis I. 5.5 Credits.
Students will learn to use diagnostic test equipment for quick and efficient problem solving. Engine vacuum testing, compression testing, cylinder leak-down testing, and cylinder power balance testing will be required. Students will learn to use an infrared analyzer to understand the effects on pollution that an improperly running engine creates. Principles of doing a tune-up will be explored. Ignition systems including point type, electronic, and distributorless systems will be covered. Prerequisites: ENG 098, FYE 101, MAT 092 or MAT 096 (or corequisite), RDG 098, or placement; AUT 110 and AUT 123 (or corequisites). Fall.

AUT 121. Performance And Diagnosis II. 5 Credits.
This course is a continuation of AUT 120 Performance and Diagnosis I. Students will learn about the various fuels used today and the problems associated with them. Fuel delivery systems starting with the carburetor through todays fuel injection systems will be studied. Emission control systems such as PCV, EGR, EFE, AIR, and the catalytic converter will be examined along with the pollutants they reduce. Computerized engine controls along with their sensors will be tested and examined for proper performance. On Board Diagnostics II will be discussed and explored. Students will complete sample questions in preparation for the ASE Certification exams. Prerequisite: AUT 120; AUT 123 (or corequisite), or permission of Division Dean. Spring.

AUT 122. Brakes. 5 Credits.
This course is designed to teach students various brake systems and repair. Students will study master cylinders, proportioning valves, metering, and disc brake repair and diagnosis. Students will learn about power assist units and wheel bearing diagnosis and repair. Anti-lock brake systems will be studied and tested as well as brake fluids and brake bleeding. Prerequisites: ENG 098, FYE 101, MAT 092 or MAT 096 (or corequisite), RDG 098, or placement; AUT 110 and AUT 123 (or corequisites).

AUT 123. Electrical Systems I. 4.5 Credits.
This course covers the fundamentals of electricity and magnetism, along with exploring the relationship of volts, ohms, and amps. The course will apply these two series, parallel, and series-parallel circuits. Semiconductor components such as diodes and transistors will be explored. Students will learn to use digital volt-ohm meters and oscilloscopes. Battery design and testing will be explored along with starting and charging systems. Prerequisites: ENG 098, FYE 101, MAT 092 or MAT 096 (or corequisite), RDG 098, or placement; AUT 110 (or corequisite). Fall.

AUT 124. Electrical Systems II. 4.5 Credits.
This course is a continuation of AUT 123 Electrical Systems I. Using wiring diagrams, students will examine headlights, taillights, and parking lights for proper operation. Stoplights, turn signals, hazard lights, and back-up light circuits will be examined and repaired. The operation of the power door locks and power windows will be examined. Electrical circuits associated with dashboards, gauges, printed circuits, and digital instrument clusters will be studied along with various other electrical circuits. Prerequisite: AUT 123, or permission of Division Dean. Spring.

AUT 125. Engine Repair. 6 Credits.
The lecture and lab periods for this course cover designs, nomenclature, and theory of operation of internal combustion engines, including valves and operating mechanism, piston and connecting rod assembly, crankshaft and bearing, lubrication system, cooling system, crankcase ventilation, engines, fuels, and lubricants. This course also includes an introduction to the study of the Wankel, diesel, and other propulsion systems. Prerequisites: ENG 098, FYE 101, MAT 092 or MAT 096 (or corequisite), RDG 098, or placement; AUT 110 and AUT 123 (or corequisites).

AUT 127. Suspension And Steering. 5 Credits.
This course is designed to teach students the various suspension components and systems. Students will learn how to inspect and replace steering components. Rack and pinion steering gears, vehicle riding height, body sway, front and rear end alignment, and tire problems will be studied. Prerequisites: AUT 110 and AUT 123 (or corequisites); ENG 098, FYE 101, MAT 092 or MAT 096 (or corequisite), RDG 098, or placement.

AUT 130. Manual Transmissions. 4 Credits.
This course covers the components and operation of manual transmissions, transaxles, clutches, differentials, drive shafts, transfer cases and all-wheel / four-wheel drive systems. Operating system principles pertaining to hydrodynamics, fluid couplings, clutch assemblies, and shift controls will be discussed. Diagnostic techniques, component, and system testing as well as maintenance

procedures are accomplished in the lab sessions. Ancillary drive train components such as drive shafts, CV joints, differentials, and transfer cases are explored. Prerequisites: AUT 125; AUT 123 (or corequisite). Fall.

AUT 131. Automatic Transmissions. 4 Credits.
This course is the study of the construction and operation of automatic transmissions and transaxles. Emphasis will be on the diagnostic techniques of electrical, hydraulic and mechanical systems. The disassembly and reassembly of selected transmissions will strengthen student understanding. Students will inspect, measure and test the transmission as required for successful performance. Prerequisite: AUT 125; AUT 123 (or corequisite). Spring.

AUT 161. Introduction to EV Technology. 3 Credits.
In this introductory course, students will learn about the hazards associated with high voltage and the safety precautions required to mitigate them. Topics covered include major EV subsystems, including battery heating/cooling, regenerative braking, and HVAC; HV battery construction and basic maintenance items unique to electric and hybrid vehicles; how charging works and the differences between charging levels and methods; and the role of a 12v battery in an electric/hybrid vehicle. Students will be able to utilize this information and apply it to perform minor diagnostics and repairs on electric vehicles. Prerequisites: AUT 123, AUT 124; AUT 125, AUT 204 (or corequisites).

AUT 204. Heating And Air Conditioning. 3 Credits.
This course is designed to teach students about the theory and operation of heating and air conditioning systems. Students will learn about heat transfer, temperature pressure relationships, and control systems. The course will cover the theory and operation of air conditioning systems, air management delivery systems, and electronic climate control systems. The course will prepare students to take the ASE test A-7 Heating and Air Conditioning Systems. Prerequisites: FYE 101, MAT 092 or MAT 096 (or corequisite), RDG 098, or placement, AUT 123 (or corequisite).

AUT 205. Automotive Cooperative. 3 Credits.
This is the Automotive Degree Program’s required internship, offered during the summer semester only. This internship is designed to help you relate your college courses to your career goals. This provides students with hands-on entry-level experience at a new car dealership or an independent repair facility or repair shop. Students are required to work at a facility approved by the Automotive Program Department Chair. Periodic supervisor evaluations based on performance and other criteria related to successful employment will be completed and reviewed by the co-op coordinator and site supervisor and will be the basis for the final grade. Tools identified on the student tool list are required at the co-op site. A minimum grade of C is required to continue toward degree completion. This three-credit cooperative course requires a minimum of 120 hours automotive work at an approved facility. Prerequisite: Successful completion of 25 AUT credits. Summer.

AUT 271. EV Battery Frameworks. 4 Credits.
In this course students will learn the emerging battery technologies, including historical development and future possibilities. The student will be exposed to the different battery chemistries and how those are implemented for safe effective use. Topics also covered include battery anatomy, battery performance and environmental implications. Finally, they will explore emerging battery technologies and future prospects in the EV/Hybrid battery field. Prerequisites: AUT 123, AUT 124, AUT 125, AUT 161, AUT 204.

AUT 281. EV Components & Electric Drive Motors. 4 Credits.
In this course we will cover the essential aspects of electric vehicle drive units and electric motors, from the basics of motor types to advanced technologies and system integration. Students will learn about EV/HEV drive units and their operation. Topics covered will include drive unit components (rotors, stators, gearboxes, housing), different types of drive units, and diagnostics as they relate to EV driveability concerns. Students will practice using scan tools and HEV/EV-rated tools to perform repairs and component replacements on electric vehicles. They will apply this technical knowledge paired with their diagnostic experience in previous classes to successfully diagnose and repair various EV drive unit concerns. Prerequisites: AUT 123, AUT 124, AUT 161, AUT 271, AUT 204.