Auto Service Technician

Organization
Washburn Institute of Technology

Program Number
47.0604

Instructional Level
Certificate

Target Population
Grades 11 & 12
Post-secondary

Description
The Auto Service Technician program prepares individuals to apply technical knowledge and skills to repair, service, and maintain all types of automobiles. Instruction includes basic theory and familiarization of automotive components, engine repair and performance, steering and suspension, automatic and manual transmission and transaxle, brakes, electricity/electronics, and heating and air conditioning systems. Hands-on activities are included for foundation and advanced courses. Student owned tools and tool boxes are required for advanced courses. Students in Applied Engine Performance will graduate certified in air conditioning. Students are required to purchase work shirts to be worn throughout the program.

Entry Requirements

WorkKeys®	Applied Math	Level 4
WorkKeys®	Reading for Information	Level 4

Assessment Plan
Assessment is an integral part of the educational process at Washburn Tech and accurate feedback is an important tool in continuously improving the institution's technical programs. Students can expect to participate in assessment activities prior to entry into programs, within specific courses and following program completion for specific fields of study.

Student Learning Outcomes
A. Communicate effectively.
B. Integrate technology.
C. Learn effectively - use academics effectively.
D. Demonstrate cooperative/teamwork skills.
E. Apply safety.
F. Think critically and creatively.
G. Demonstrate responsible work ethics.

Program Outcomes

A. Demonstrate job entry skill levels as appropriate for (NATEF) Automotive Service Technician (AST)

B. Demonstrate job entry skill levels as appropriate for(NATEF) Master Automotive Service Technician (MAST)

C. Identify vehicle components and systems.

D. Model industry standard behaviors in areas such as safety, appearance, attendance, ethics, and communication.

E. Differentiate correct from incorrect responses to standardized test questions such as NATEF/ASE end of program tests.

F. Evaluate vehicle performance to manufacturer's specifications.

G. Measure components and compare to manufacturer's specification.

H. Diagnose and repair common faults.

I. Operate advanced engine diagnostic equipment.

J. Utilize factory service information and resources.

K. Prepare collected data in a professional report format.

Course #	Course Title	Credit Hours	Required
AUT111	Engine Overhaul	3	Yes
AUT112	Engine Mechanical Diagnosis	3	Yes
AUT120	Auto Transmission/Transaxle I	3	Yes
AUT130	Manual Transmission I	2	Yes
AUT140	Steering & Suspension I	3	Yes
AUT150	Brakes I	3	Yes
AUT161	Electrical I	3	Yes
AUT162	Electricity/Electronics I	5	Yes
AUT170	Heating-Air Conditioning I	2	Yes
AUT181	Engine Performance I	6	Yes
AUT182	Engine Performance II	6	Yes
AUT220	Auto Transmission/Transaxle II	3	Yes
AUT230	Manual Transmission II	2	Yes
AUT240	Steering & Suspension II	2	Yes
AUT251	Brakes II	3	Yes
AUT260	Electricity/Electronics II	6	Yes
AUT270	Heating-Air Conditioning II	2	Yes
AUT281	Engine Performance III	5	Yes
AUT290	Auto OJT (Optional)	2	No

Program Course Descriptions

AUT111 Engine Overhaul (3 credits)

This Engine overhaul introduces the student to the concepts and skills necessary to diagnose and overhaul automotive engines. Areas covered in this class include introduction to specialty tools and their correct use, complete engine disassembly, inspection and measurement of internal components including heads, valve resurfacing, and proper fitting and reassembly of entire "long block". Class time is divided between classroom and lab.

AUT112 Engine Mechanical Diagnosis (3 credits)

Engine Mechanical Diagnosis involves diagnostic theory, process, and testing as well as practicing major component replacement. Students will split their time between the classroom and lab.

AUT120 Auto Transmission/Transaxle I (3 credits)

Automatic Transmission/Transaxle I is a basic introduction to automatic transmissions/transaxle systems. The course includes an introduction to hydraulic principles, an introduction to the different types of automatic transmission fluids, automotive measurement, and the identification to the parts of the automatic transmission including planetary gear sets, brake bands, bearings, pumps, boost systems, and valve bodies. It also contains some basic services performed on an automatic transmission including oil filter replacement, air testing of clutch packs, removing and refitting a transaxle and/or transmission. Students will receive instruction that will assist them in taking the Automotive Service Excellence (ASE) Exams after successfully completing the requirements of the 1st and 2nd levels of the automotive technology program.

AUT130 Manual Transmission I (2 credits)

Manual Drive Train & Axles I is a basic introduction to the manual transmission found in the automotive industry. The course includes an introduction to the theory behind manual transmissions, identification of the different types of transmission and their components, and an introduction to the specialized tools used in servicing transmissions, synchromesh transmissions, gear ratios found in different transmissions, an introduction to manual clutches and transfer cases, and drive shaft technology including CV joint and bearing replacement. Students will receive instruction that will assist them in taking the Automotive Service Excellence (ASE) exams after successfully completing the 1st and 2nd levels of the automotive technology program.

AUT140 Steering & Suspension I (3 credits)

Suspension & Steering I introduces automotive steering and suspension systems. The course includes hydraulic principles, bushing replacement, long and short arm diagnosis and replacement, parallelogram steering geometry diagnosis and repair, McPherson strut strip down and refit, and the effect of damping and rebound on the vehicle handling, spring design measuring, and replacement. Classroom time is divided between lecture, discussion, and individual learning activities.

AUT150 Brakes I (3 credits)

Brakes I is a basic introduction to automotive brake technology. The emphasis in this course is on diagnosing and maintaining brake systems. It covers identification of brake parts and how they function, the use and types of friction materials and heat dissipation, stripping and refitting both disc and drum brakes, rotor diagnosing including measurement and cutting, identification of pad types, hydraulic principles and brake bleeding. The course is closely aligned with NATEF/ASE task list for A5 and will prepare the student to take the Automotive Service Excellence (ASE) exams. Classroom time is divided between lecture, discussion, and individual learning activities.

AUT161 Electrical I (3 credits)

In this course students will complete service work orders; describe the relationship between voltage, ohms and amperage; perform basic electrical circuit repairs; identify electrical system faults; identify basic wiring diagram symbols, components, and legend information; perform basic electrical circuit measurements using a DVOM; describe basic circuit characteristics of series, parallel and series parallel circuits through a variety of classroom and shop learning assessment activities.

AUT162 Electricity/Electronics I (5 credits)

Electrical & Electronic Systems I builds on the skills developed in AUT161 (Electrical I). This course emphasizes battery design, starter systems, and the charging system and its components. In addition to these systems, hybrid technology will be explored. Class time is divided between the classroom and lab experiences. Classroom is primarily lecture, discussion, and group or individual learning activities that emphasize troubleshooting and problem-solving skill development. Prerequisite: AUT161

AUT170 Heating/Air Conditioning I (2 credits)

Heating & Air Conditioning I is an introductory course that is designed to provide the student with a solid foundation in automotive heating and air conditioning. Class time is divided between the classroom and lab experiences. Classroom time is spent primarily on lecture, discussion, and group or individual learning activities that provide a foundation to encourage troubleshooting skill development.

AUT181 Engine Performance I (6 credits)

In Engine Performance I students will complete work order and check history; identify engine mechanical integrity; explore the fundamentals of fuel system theory; identify fuel system concerns; explore the fundamentals of ignition theory; identify ignition system concerns; identify induction system concerns; identify exhaust system concerns; identify engine mechanical integrity through a variety of learning and assessment activities.

AUT182 Engine Performance II (6 credits)

Engine Performance II builds on the knowledge and skills developed in AUT181 (Engine Performance I). The course continues the study of theory and of power train diagnostics. Students will learn the rudiment of computerized engine controls, ignition systems, fuel, air induction, and exhaust and emission control systems. The course provides extensive hands-on training on the use of the latest diagnostic equipment and tools. Prerequisite: AUT181

AUT220 Auto Transmission/Transaxle II (3 credits)

Automotive Transmission & Transaxles II is the advanced application of knowledge and hands-on skills acquired in AUT120 (Automatic Trans & Transaxles I). The course includes testing, troubleshooting and diagnosing, disassembly, inspection, and assembly of automatic transmissions and transaxles according to manufacturer's specifications. Electronically controlled automatic transmission components and operation are covered along with diagnosing and repair. Students will receive instruction that will assist them in taking the Automotive Service Excellence (ASE) exams after successfully completing the requirements of the 1st and 2nd levels of the automotive technology program.

AUT230 Manual Transmission II (2 credits)

Manual Drive Train and Axles II contains the advanced application of knowledge and hands on skills acquired in Manual Drive Train & Axles I. Emphasis will be on testing, troubleshooting and diagnosing, disassembling, inspecting and assembling transmissions and trans axles according to manufacturer's specifications. Students will receive instruction that will assist them in taking the automotive excellence (ASE) exams after successfully completing the requirements of the 1st and 2nd levels of the automotive technology program.

AUT240 Steering & Suspension II (2 credits)

Steering & Suspension II is the advanced application of knowledge and hands-on skills learned in AUT140 (Steering & Suspension I). The course includes the use of alignment geometry and computerized alignment equipment to diagnose and repair steering suspension problems and to verify that a vehicle's suspension and steering components are within manufacturer's specifications. It also includes removing and replacing steering and suspension components according to manufacturer's specifications, inspecting, servicing, and repairing wheel and tire assemblies for optimum performance. Prerequisite: AUT140

AUT251 Brakes II (3 credits)

Brakes II apply the knowledge and hands-on skills acquired in AUT150 (Brakes I). It includes testing troubleshooting, diagnosing, disassembling, and replacing both automotive drum and disc brake systems using manufacturer's specifications, four-wheel and rear wheel anti-lock braking system components, operations, and repairs will also be covered. Prerequisite: AUT150

AUT260 Electricity/Electronics II (6 credits)

Electrical/Electronic Systems II is an advanced level course and builds on the knowledge, skills and abilities mastered in AUT160 Electrical/Electronic Systems I. This class involves the theory and application of automotive electronic circuits and accessories. It includes the construction and servicing of lighting systems, gauges, warning devices, windshield wipers, and solid state devices. The course provides the knowledge to prepare for the Automotive Service Excellence (ASE) Exams. The course is aligned closely with the NATEF/ASE task list for A6 Electrical/Electronic Systems.

AUT270 Heating/Air Conditioning II (2 credits)

Heating and Air Conditioning II is an advanced level course and builds on the knowledge, skills and abilities mastered in AUT170 Heating & Air Conditioning I. Climate control systems are explained in-depth including theory of refrigeration, servicing procedures, and diagnosis techniques. Compressor service and distribution systems are studied. Laboratory experience is given in testing and servicing a variety of systems and problems. The course provides the knowledge to prepare for the Automotive Service Excellence (ASE) exams. The course is aligned closely with the NATEF/ASE task list for A7 Heating & Air Conditioning.

AUT281 Engine Performance III (5 credits)

Cabinet/Mill Engine Performance III is an advanced level course and builds on the knowledge, skills, and abilities mastered in Engine Performance I (AUT181) and Engine Performance II (AUT182). This class involves theory and application of automotive engine diagnostics including computerized engine controls, ignition systems, fuel, air induction and exhaust systems, emission control systems, and exhaust gas treatments. The course provides extensive hands-on training on the use of the latest diagnostic equipment and tools. The class provides the knowledge to prepare for the Automotive Service Excellence (ASE) exams. The course is closely aligned with the NATEF/ASE task list for A8 Engine Performance.

AUT290 Auto OJT (Optional) (2 credits)

On-the-Job Training (OJT) is an elective course for a student to work at a job site to apply skills and knowledge acquired in the program. A student is eligible for OJT only upon completion of all the program competencies, 90% attendance throughout the program, all expenses paid to the school, completion of the institution exit assessment, and agreement completed with an employer. If a student does not comply to the attendance and job performance expectations of the employer, the student will be required to return to the program. This is a pass/fail course.

Disability

The Americans with Disabilities Act (ADA) Office is responsible for assisting in arranging accommodations and for identifying resources at Washburn Institute of Technology for persons with disabilities. Qualified students with disabilities MUST self-identify by completing an application. In addition students must provide appropriate medical documentation to the ADA coordinator to be eligible for accommodations. New requests for accommodations should be submitted at least two months or more prior to the date the accommodations are needed. However, please contact the ADA office as soon as a need may arise. Depending on the accommodation request, four to eight weeks lead time may be needed for timely and effective provision of accommodations.

The ADA Office coordinates and assists in arranging accommodations it deems appropriate for eligible students on a case-by-case basis. If you are a student with a disability that may substantially limit your ability to participate in any of our classes and you believe that you will need accommodations, it is your responsibility to contact: ADA Coordinator, 785.670.3365 or Gloria.christian@washburn.edu.

Washburn University prohibits discrimination on the basis of race, color, religion, age, national origin, ancestry, disability, sex, sexual orientation, gender identity, genetic information, veteran status, or marital or parental status. The following person has been designated to handle inquiries regarding the non-discrimination policies: Dr. Pamela Foster, Equal Opportunity Director/Title IX Coordinator, Washburn University, 1700 SW College Ave, Topeka, Kansas 66621, 785.670.1509, eodirector@washburn.edu.