

## Automotive Technology Washburn Institute of Technology

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Program Hours:        8:00 AM - 11:10 AM; 11:45 AM - 2:55 PM

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### Program Description:

The **Automotive Technology** program offers students a well-equipped modern facility with a fleet of late model vehicles. Content includes the major systems on domestic, European, and Asian vehicles. Completion of the program prepares students for entry level positions as Automotive Technicians.



The Washburn Institute of Technology Automotive Technology Program is certified by the National Automotive Technicians Education Foundation (NATEF), an affiliate of the National Institute for Automotive Service Excellence (ASE). NATEF certification signifies that the program meets uniform national standards for instructional facilities, equipment, staff credentials, and curriculum. Additionally, domestic and import car manufacturers provide substantial support of the programs as students are prepared for ASE certification.



The program provides students with both in-depth classroom training and extensive hands-on experiences. The full program takes four semesters to complete in either two years (half day students) or one year (full day students). Entrance into the program requires an application and successful completion of prerequisites including minimum WorkKeys scores of: Math=4, Reading =4 and Locating Information=4.

In addition to textbooks and workbooks all students are required to supply items such as OSHA approved clear lens safety glasses/goggles, steel toe shoes, and clean uniforms. The purchase of hand tools is required. Students are expected to maintain high standards of professional behavior and are required to follow the program dress code and safety policies at all time.

# **Automotive Technology**

## **Washburn Institute of Technology**

### **Methods of Instruction:**

- Lectures
- Discussions
- Individual & Group Activities
- Task/Job Sheets
- Lab work
- Demonstrations
- Speakers
- Field trips
- Audio/Visual Presentation
- Computer Based Instruction
- Written Evaluations
- Performance (Shop) Evaluations

### **Career Titles:**

Successful completion of the Auto Technology Program will enable the student to find employment in businesses such as: automotive/truck dealerships; independent service shops; franchise repair shops; and fleet service/maintenance facilities as an automotive technician. Other possible positions include: mechanic's helper; service writers; service managers; parts counter persons or managers; as well as positions in auto related marketing and sales.

### **Tool Policy:**

Our goal is to ensure that every student has a basic tool set that will meet their needs during training and is appropriate for an entry level position as an Automotive Technician. The "Required Tool List" is a listing of required tools for Automotive Technology students and is only a starting point. Students will want to add to their sets as their budget allows. Tools purchased must be of good quality and we encourage students to buy the best quality tools they can afford.

If a student is unable to meet the tool requirements prior to the start of the school year, they may request an extension from the instructor. Generally, extensions will only be granted if the tools have been ordered but not delivered or if there is a financial hardship that is causing a short delay in acquiring the tools. Special arrangements can be made to meet the needs of students who require some of their tools at their place of employment. A limited number of rental tool sets are available. Failure to meet the tool requirement or not having an approved extension may result in removal from the program.

### **Vehicle Policy:**

Do not sit, lean, set objects, tools, parts, brooms, etc. on the vehicles. Students are not permitted in vehicles (customer, personal or school owned) without the instructors' permission. Any intentional damage or destruction of property or vehicles will be referred to administration for disciplinary action. The administration will determine appropriate restitution for damages. (See student handbook)

Allowing vehicles to come into the shop for work is solely at the instructor's discretion. At a minimum:

1. Required repairs or service must meet the training needs and objectives of the program.
2. The project has prior approval of the instructor.
3. The student is in good standing with the school and program.

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### **Program Policies:**

- Students are to arrive for class on time and be prepared to learn. Except in cases of emergencies, students are expected to attend school unless physically unable. Absences or tardiness will negatively impact grades.
  - Class will be dismissed in the classroom by the instructor.
  - Students are to inform instructors any time they are on medications (prescription or over-the-counter). This is necessary for the instructor to modify their activities in the shop to ensure safe operation of equipment and machinery.
  - Students will follow all safety requirements and instructions.
  - No cell phones or pagers in shop/classroom without instructor's prior approval.
  - Laser lights are prohibited in shop/classroom.
  - Food and drink are not allowed in the shop/classroom without the instructor's permission.
  - No music devices in shop/classroom including usage of vehicle radios/CD players, etc.
  - Appropriate and professional behavior is expected at all times. No horseplay, profanity, running, etc.
- Harassment of any kind – sexual, racial, or verbal, will not be tolerated. (see student handbook)
  - Students will clean up their own work areas daily and participate in general shop duties.
  - Students will work in their designated shop area unless they have received prior permission of the instructor.
  - Students will take an active role in group/team projects.
  - Students are not allowed in the instructor's office unless an instructor is present and permission is given.
  - Students are not permitted to be in their personal vehicle during class or breaks without the instructor's permission.
  - Students may request a locker to keep books, change of clothes and personal items during class. Students may keep personal items in their locker or tool box that are allowed on campus but are not allowed in shops or classrooms.
  - The options to make-up missed work or to accept late work is at the discretion of the instructor.
  - Students will not be able to test drive vehicles without a valid Driver's License.

### **Dress Code:**

- Students will wear dark blue Washburn Tech T-shirt or a light blue Washburn Tech button-down shirt at all times. Shirts are available from the warehouse.
- Washburn Tech button-down shirts must be clean and tucked in.
- Washburn Tech T-shirts must be clean but are not required to be tucked in.
- Students will wear jeans or a similar type of pants in good condition. (no shorts or loose/baggy/torn pants are acceptable)
- Dresses are not allowed for female students.
- Steel toe capped shoes or work boots will be worn in the shop area.
- No loose fitting or dangly Jewelry is allowed.
- Metal banded wristwatches and rings are not recommended in the lab.

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**Grading Criteria:**

Grades reflect the student's performance in both the classroom and lab and are the basis for quarterly, semester and final grades.

**Grading Scale**

93% – 100%	A
85% – 92%	B
76% - 84%	C
69% - 75%	D
0% - 68%	F

**Grading Breakdown**

**Lab Activities.....40%**

A composite evaluation of hands-on tasks performed in the lab such as:

1. Tool usage
2. Use of reference materials
3. Adherence to safety (zero tolerance)
4. Work completed to industry standards

**Daily Behavior .....30%**

A daily grade based on 10 points per day. No points are earned if absent.

Areas evaluated are:

1. Participation: Arrived at class/lab on time and equipped to learn by having all required materials such as safety glasses, writing utensils, books, etc. Actively contributing to class discussions, timely completion of assignments, and contributing to a positive learning environment
2. Attitude: Willingness to work with instructors and other students, respect of other points of view and learning styles, ready and willing to learn
3. Professionalism: Required uniform shirt or Washburn Tech T-Shirt clean and tucked in. Adherence to dress

code and to all other program and school policies regarding tools, vehicles, behavior, etc

4. Safety: (Violation of safety policy may result in loss of ALL daily points) Safety glasses with clear lenses and side shields worn in required areas, steel toed boots or shoes worn, no horseplay.
5. Sanitation: Work area and any other assigned area kept neat and clean.

**Classroom Activities..... 20%**

A composite grade based on the quality of completed classroom assignments such as:

1. Written assignments
2. Homework
3. Oral presentations
4. Quizzes (daily or weekly)
5. End of topic written or performance exams.
6. Mid-Term exams

**Final Exams ..... 10%**

A composite grade based on written, oral and performance exams such as:

1. End of course written or performance exams.
2. Hands-on performance exams

**Articulation Agreement:**

**Articulation  
Agreements**

Washburn Tech programs have articulation agreements with all community colleges, Fort Hays State University and Washburn University. For more information on continuing education options, the student can make an appointment to visit with a Washburn Tech counselor.

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**Program Courses**

Units of study and tasks adhere to NATEF (National Automotive Technician Education Foundation) standards and include eight of the ASE (Automotive Service Excellence) areas of certification.

**(ASE:A1) Engine Repair**

**AUT111**

**Engine Overhaul**

**Credits: 3**

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.

*The course is aligned with the ASE task list for A1 Engine Repair*

*Prerequisite: None*

**AUT112**

**Engine Mechanical Diagnosis**

Engine Mechanical Diagnosis is the advanced application of the knowledge and skills learned in AUT111 Engine Overhaul. The class will involve diagnostic theory, process and testing as well as practicing major component replacement. You will split your time between the classroom and lab.

*The course is aligned with the ASE task list for A1 Engine Repair*

*Prerequisite: None*

**(ASE:A2) Automatic Transmission/Transaxle**

**AUT120**

**Auto Trans/Transaxle I**

**Credits: 3**

Automatic Transmission/Transaxle I is an introduction to automotive automatic transmission/transaxle systems. The course includes hydraulic principles, the different types of automatic transmissions and transaxles, the identification and function of parts, planetary gear sets, brake bands, bearings, pumps, valve bodies, and torque converters. Class includes instruction for basic services performed on an automatic transmission including oil filter replacement, air testing of clutch packs, removing and refitting a transaxle and/or transmission. Class time is divided between the classroom and lab.

*The course is aligned with the ASE task list for A2 Automatic Transmission/Transaxle.*

*Prerequisite: None*

**AUT220**

**Auto Trans/Transaxle II**

**Credits: 3**

Automotive Transmission and Transaxles II is the advanced application of the skills acquired in AUT120 Automatic Trans and 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. Class time is divided between the classroom and lab.

*The course is aligned with the ASE task list for A2 Automatic Transmission/Transaxle*

*Prerequisite: AUT120*

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**(ASE:A3) Manual Drive Train and Axles**

**AUT130**

**Manual Transmission I**

**Credits: 2**

Manual Drive Train and Axles I is an introduction to the manual transmission and related drive train components found in the automotive industry. The course includes the fundamentals of manual transmissions, identification of the different types of transmissions, and an introduction to the specialized tools used in servicing these transmissions. Class includes introduction to manual clutch, diagnosis and replacement, transfer case service, driveshaft technology including CV joint and bearing replacement, and general rear axle service. Class time is divided between the classroom and lab.

*The course is aligned with the ASE task list for A3 Manual Drive Train and Axles*

*Prerequisite: None*

**AUT230**

**Manual Transmission II**

**Credits: 2**

Manual Drive Train and Axles II contains the advanced application of the skills acquired in AUT130 Manual Drive Train & Axles I. Emphasis will be on testing, troubleshooting and diagnosing, disassembling, inspecting and assembling transmissions, transaxles, setting up front and rear axle ring and pinions, and advanced drive train service, according to manufacturer's specifications. Class time is divided between the classroom and lab.

*The course is aligned with the ASE task list for A3 Manual Drive Train and Axles*

*Prerequisite: AUT130*

**(ASE:A4) Suspension and Steering**

**AUT140**

**Steering and Suspension I**

**Credits: 3**

Suspension and Steering I introduces automotive steering and suspension systems. The course includes the identification of suspension and steering systems; 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.

*The course is aligned with the ASE task list for A4 Suspension and Steering.*

*Prerequisite: None*

**AUT240**

**Steering & Suspension II**

**Credits: 2**

Steering and Suspension II is the advanced application of knowledge and hands on skills learned in Suspension and Steering I. The course includes the use of alignment geometry, and computerized alignment equipment to diagnose and repair steering and suspension problems and to verify that a vehicle's suspension & 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.

*The course is aligned with the ASE task list for A4 Suspension and Steering*

*Prerequisite: AUT140*

**(ASE:A5) Brakes**

**AUT150**

**Brakes I**

**Credits: 3**

Brakes I introduces 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. Classroom time is divided between lecture, discussion and individual learning activities.

*The course is aligned with the ASE task list for A5 Brakes*

*Prerequisite: None*

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### **AUT250**

### **Brakes II**

**Credits: 2**

Brakes II applies the knowledge and hands on skills acquired in 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.

*The course is aligned with the ASE task list for A5 Brakes.*

*Prerequisite: AUT150*

## **(ASE:A6) Electrical/Electronic System**

### **AUT161**

### **Electrical I**

**Credits: 3**

Electrical 1 is an introductory course that provides the student with a solid foundation in the fundamentals of electrical theory as well as a working knowledge of the many electrical systems of the automobile. Lab activities will emphasize trouble shooting circuits and components. Course time is divided between the classroom and lab experiences. Classroom is primarily lecture, discussion and group or individual learning activities that emphasize trouble shooting and problem solving skill development.

*This course is aligned with the ASE task list for A6 Electrical/Electronic Systems*

*Perquisite: None*

### **AUT162**

### **Electricity/Electronic I**

**Credits: 2**

Electricity/Electronic 1 builds on the skills developed in AUT 161. 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 trouble shooting and problem solving skill development.

*This course is aligned with the ASE task list for A6 Electrical/Electronic Systems*

*Perquisite: AUT 161*

### **AUT260**

### **Electricity/Electronic II**

**Credits: 6**

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 is aligned with the ASE task list for A6 Electrical/Electronic Systems.*

*Prerequisite: AUT162*

## **(ASE:A7) Heating and Air Conditioning**

### **AUT170**

### **Heating-Air Conditioning I**

**Credits: 2**

Heating and 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.

*The course is aligned with the ASE task list for for A7 Heating and Air Conditioning.*

*Perquisite: None*

### **AUT270**

### **Heating-Air Condition II**

**Credits: 2**

Heating and Air Conditioning II is an advanced level course and builds on the knowledge, skills and abilities mastered in AT1700 Heating and 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 is aligned with the ASE task list for A7 Heating and Air Conditioning*

*Prerequisite: AUT170*

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**(ASE:8) Engine Performance**

**AUT181**

**Engine Performance I**

**Credits: 3**

Engine Performance 1 is an introductory course that is designed to provide the student with a solid foundation in automotive engine performance. 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.

*The course is aligned with the ASE task list for A8 Engine Performance*

*Prerequisite: None*

**AUT182/184**

**Engine Performance II**

**Credits: 3/2**

Engine Performance II builds on the knowledge and skills developed in Engine Performance I. The course continues the study of theory and of power train diagnostics. Students will learn the rudiments 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.

*The course is aligned with the ASE task list for A8 Engine Performance.*

*Prerequisite: AUT181*

**AUT280**

**Engine Performance III**

**Credits: 5**

Engine Performance III is an advanced level course and builds on the knowledge, skills and abilities mastered in AUT180 Engine Performance I. 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 course is aligned with the ASE task list for A8 Engine Performance.*

*Prerequisite: AUT181 and 182/184*

**Fundamentals Elective (Holton Campus)**

**AUT183**

**Auto Fundamentals**

**Credits: 1**

Auto Fundamentals is an introduction to many of the skills and techniques of the automotive technician. Students will learn about many of the tools and practices used in the field as well as several of the basic automotive systems. Subjects include shop safety, vehicle lifting and jacking, hand tools and their use.

*This course is aligned with the ASE task list*

*Prerequisite: None*