

AUTOMOTIVE SERVICE TECHNOLOGY TOOL LIST

Ferris State University does not sell tools. All automotive students are required to provide their own hand tool set. Students may purchase tools from any vendor of their preference. Tool vendors may or may not offer tool discounts to students. Please check on discount availability with your chosen vendor. This tool packet contains several tool lists to accommodate varying student start dates and scheduling situations. Additional lists created in this packet are formed from the complete tool list to break down student tool needs by semester and class. Please use the list that will fit your needs.

1. **Basic Computer Requirements** are located on (P.2) Computers are utilized by the automotive students on a regular basis. The basic lap top requirements have been set by the University IT department.
2. **The complete tool list** is found on (P. 3-4). This tool list is the minimum number and type of tools the student needs to have in their toolbox to fulfill class and course requirements. Any additional tools the student may have in their box is welcomed if they can fit in the storage cart required by the automotive department.
3. **Optional tools** are found on (P. 5) tools that are recognized by the automotive staff and advisory committee that may be helpful to have in a toolbox. However, these tools are not necessary for the completion of the individual classes found in the automotive program.
4. **Tool Cart/Storage Size requirements** found on (P.5) All tools including toolboxes and safety equipment must be purchased by third semester. Tool storage dimensions need to be followed for the following: Keep the overall cost of storage low, allow students to move their tools between classes if needed, and provide ease in transport and store their tools after the student completes the program.
5. **The second and third tool lists are created by the individual semester and the courses** offered (P.4-7). Not all automotive students take the same automotive classes when starting the automotive program. Tools may be purchased over a period to match the course requirements.

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Recommended Laptop Specifications

This is a list of laptop minimum specifications for all manufacturing students.

When purchasing a laptop, students should pay close attention to the descriptions provided. Adhering to these specifications will help ensure smooth and efficient operation of all required software.

If a laptop does not meet these minimum specifications, the student assumes the risk of having a problematic and/or non-functional system which may affect their ability to complete required coursework.

Please consider obtaining an external drive for file backup and storage for potential large files.

Item	Description
1.	Processor <ul style="list-style-type: none">- Intel- i7 or i9- 64-bit System- Dual Cores
2.	RAM (Random Access Memory) <ul style="list-style-type: none">- 16 – 32 GB
3.	Video RAM (Video Random Access Memory) <ul style="list-style-type: none">- NVidia-Based Chipset (Separate Video Card Recommended)- 1 GB
4.	Hard Drive: 500 GB (Solid State Drive Recommended)
5.	Display: 15" High Resolution
6.	Wireless Network Adapter: Required
7.	Ethernet Network Adapter: Required
8.	Optical Drive (DVD +/- RW): Optional
9.	Keyboard: Number Keypad Recommended
10.	Mouse: 3-Button, Scroll Type Recommended
11.	Operating System: Windows 10 or 11
12.	Software <ul style="list-style-type: none">- Microsoft Office Professional (Available free of charge to students through FSU.)- CAD/CAM Software is available to SAE Team sport members free through a sponsorship – It is recommended to install on a desktop and store files on an external hard drive.

Complete Tool List

Sockets With Ratchets

- (1) 1/4" drive metric 6 point socket set metric
- (1) 3/8" drive metric 6 point socket set 8mm - 19mm (deep & shallow)
- (2) 3/8" drive spark plug sockets Flex Head -- 13/16" & 5/8"
- (1) 1/2" drive metric 6 point socket set 12mm - 24mm (deep & shallow)
- (1) 1/2" drive metric 6 point **impact** socket set - 12mm - 24mm
- (1) 1/2" drive lug nut deep well **impact** sockets - 3/4", 13/16", 19mm
- (1) ¼ drive ratchet, 3/8 drive ratchet, and ½ drive ratchet

Wrenches

- (1) Metric combination wrench set 7mm to 22mm
- (1) Metric flare nut wrench set - 6 pieces - 9mm to 21mm

Torque Wrench

- (1) 3/8" drive in/lb torque wrench (0 to 50 in/lb)
- (1) Torque wrench 0 to 150 ft/lb capacity

Screw Drivers

- (2) Pocket Screw Driver
- (1) Screwdriver set including 4 standard, 4 Phillips #1, 2, 3, 4
- (1) 3 piece pry bar set (screw driver type)

Pliers

- (1) Pliers- slip joint
- (1) Pliers - needle nose
- (1) Pliers - diagonal wire cutters
- (1) Pliers - 9" channel lock type
- (1) flat feeler gauge set (must have .0015 gauge)
- (1) Pliers - 6" vise grip
- (1) Pliers - 10" vise grip
- (1) Pliers - wire stripper/crimper
- (1) External snap ring pliers
- (1) Internal snap ring pliers

Hammers

- (1) Plastic tip hammer
- (1) Ball peen hammers - 8 oz, 20 oz and 24 oz
- (1) Medium size dead blow
- (1) 30 oz Hammer

Brake Tools

- (2) Brake adjusting tools
- (1) Brake return spring removing and installing tool
- (1) Brake spring hold down tool

Punch & Chisels & Drifts

- (1) Punch set (5/16" center punch, ¼" starter punch, 3/16" & 5/16" pin punch) 1 Chisel set (3/8", ½" & ¾")
- (1) Chisel holder
- (1) Brass drift-6"
- (1) Scratch awl

Files

- (1) Files, 2 flat, 1 - 3/8" x 10" round, 1 - 3 cornered 10"
- (1) File handles

Electrical

- (1) DVOM (Fluke Series 87 Multimeter, Fluke Series 88 Multimeter or equivalent, minimum standard should have frequency capabilities)
- (1) HEI sparkplug tester
- (1) Test light- circuit powered
- (1) Jumper Wires (Retractable)

Measurement

- (1) Wire spark plug gap gauge
- (1) 25' tape measure
- (1) Tire gauge

Torx & Allen

- (1) Set Torx bits- 3/8" or 1/4" drive set (T27, 30,40,45,55 & GM 50)
- (1) Torx sockets (E8, 10, 12, 14, &16)
- (1) Metric Allen wrench set
- (1) Allen Wrench set (standard)

PPE

- (1) Fender Covers
- (2) Work Uniforms Shirts and Pants - Required and explained in Auto200 Syllabus
- (2) Pair of Safety Glasses
- (1) Pair of Closed toed leather Boots

Additional Items

- (1) Gasket scraper
- (1) Small flashlight
- (1) Hand operated vacuum pump with gauge
- (1) Spark plug boot-removing pliers
- (1) Tire air chuck with aero fittings
- (1) Air blow gun with rubber tip and aero fittings

Tool Storage

- (1) Locking Tool Cart on casters with 3-4 drawers:

Rough Dimensions:	Length:	30"
	Width/Depth:	22"
	Height:	38"

Optional Tools

Socket Sets

- (1) 1/4" drive STANDARD 6-point socket set
- (1) 3/8" drive STANDARD 6-point socket set (deep & shallow)
- (1) 1/2" drive STANDARD 6-point socket set (deep & shallow)
- (1) 1/2" drive STANDARD 6-point **impact** socket set
- (1) Set 3/8" drive flex sockets (10mm to 17mm)
- (1) Set 1/2" drive shallow six-point impact metric socket (15mm to 22mm)
- (1) O2 Sensor socket set

Wrenches

- (1) STANDARD combination wrench set
- (1) STANDARD flare nut wrench set - 6 pieces
- (1) Pipe wrench

Electrical

- (1) Wire terminal tool kit (TT 600 Snap-On or similar)

Air/Electric Tools

- (1) 3/8" Air ratchet
- (1) 1/2" Impact wrench

Hammer

- (1) 32 or 48 oz Hammer

Miscellaneous

- (1) Telescoping magnetic pick-up tool
- (1) Valve core removing tool

Purchase Tools by Semester

First Semester - Fall (Page 6)

Classes Auto 111, Auto 112, Auto 113

<u>AUTO 111 Manual Transmissions & Drivelines:</u>	Tools in lab - no student tools required
<u>AUTO 112 Automotive Brake Systems:</u>	Tools in lab - no student tools required
<u>AUTO 113 Automotive Electricity and Electronics:</u>	Tools in Lab - See Required Tool List

Required Safety Equipment

- (1) Pair leather work shoes
- (1) Pair safety glasses

Required Tool List

Screwdrivers/Torx drivers

- (4) Standard Screwdrivers #1, 2, 3, 4
- (4) Phillips Screwdrivers #1, 2, 3, 4
- (1) Torx driver set
- (2) Pocket Screw Drivers (one for spare)

Pliers

- (1) Wire Stripper-Crimper Type

Electrical

- (1) Test light – incandescent bulb
- (1) Test light – Computer Safe Logic Probe (Automotive)
- (1) DVOM (Digital Volt OHM Meter) Fluke Series 87 Multimeter or equivalent, minimum standard

Brake Tools

- (1) Brake Spring Hold down tool
- (1) Brake Spoon – Brake Adjusting Tool
- (1) Brake Return Spring Removing and Installing Tool

Miscellaneous

- (1) Small Flash Light
- (1) Pocket Screwdriver

Second Semester - Spring (Pages 7-8)

Classes Auto 114, Auto 115, Auto 117

AUTO 114 Automotive Engines:

NOTE: AUTO 114 students must have the complete list of tools listed on the tool list (Fall and Spring Semester) before lab #4 or points will be deducted from their lab score. See Required Tool List for (Second Semester Spring)

AUTO 115 Suspension-Steering-Alignment Services: Tools in Lab - See Required Tool List for (Second Semester Spring)

AUTO 117 Electronic Fuel management: Tools in Lab – DVOM, Jumper leads, Test Light, Small Flashlight. Other tools will be specified by instructor

Required Tool List

Socket Sets

- (1) 1/4" drive metric 6 point socket set metric
- (1) 3/8" drive metric 6 point socket set 8mm - 19mm (deep & shallow)
- (2) 3/8" drive spark plug sockets Flex Head -- 13/16" & 5/8"
- (1) 1/2" drive metric 6 point socket set 12mm - 24mm (deep & shallow)
- (1) 1/2" drive metric 6 point **impact** socket set - 12mm - 24mm
- (1) 1/2" drive lug nut deep well **impact** sockets - 3/4", 13/16", 19mm
- (1) Metric Allen Set
- (1) Standard Allen Set

Wrenches

- (1) Metric combination wrench set 7mm to 22mm
- (1) Metric flare nut wrench set - 6 pieces - 9mm to 21mm

Torx

- (1) 3/8" drive set containing (T27, T30, T40, T45, T50, T55)
- (1) 3/8" drive Torx socket set containing (E8, E10, E12, E14, & E16)

Pliers

- (1) Slip Joint
- (1) 16" channel lock type
- (1) Needle Nose
- (1) Side Cutter/Dyke Type
- (1) 9" Channel Lock Type
- (1) 6" vise grip
- (1) 10" vise grip
- (1) External snap ring pliers
- (1) Internal snap ring pliers

Hammers

- (1) Ball Peen 8 oz
- (1) Ball Peen 10 oz
- (1) Ball Peen 24 oz
- (1) 30 oz
- (1) Medium Dead Blow

Torque wrench

- (1) 0 to 150 ft/lb. capacity (Make sure it is as long or longer than 22 inches overall)

Measurement

- (1) 6" steel rule (1/32 & mm scale)
- (1) Steel tape measure (12 ft. long)
- (1) Flat feeler gauge set (must include a .0015 gauge)
- (1) Spark plug Gap Gauge (Wire Type)

Pry Bar

- (1) Set of 3-4 pry bars: 8", 12", 18" (an economical set is preferred)

Punches/Drifts

- (1) Punch set (5/16" center punch, ¼" starter punch, 3/16" & 5/16" pin punch)
- (1) Chisel set (3/8", ½" & ¾")
- (1) Chisel Holder
- (1) Brass drift-6"

Files

- (2) File handles
- (1) flat
- (1) 3/8" x 10" round
- (1) 3 cornered (triangle) 10"
- (1) Set of 3 of small/fine

Tire Tools

- (1) Tire gauge
- (1) Tire air chuck
- (1) Valve core removing tool

Impact

- (1) 3/8 drive of either electric or air. This can also be in either "gun" or "ratchet" style
- (1) 1/2" drive of either electric or air.

Miscellaneous

- (1) Air blow gun with rubber tip and aero fittings
- (1) Retractable Jumper Wire Set. (2 leads minimum)
- (1) Spark Plug Tester
- (1) Vacuum Gauge

Tool Storage

- (1) Locking Tool Cart on casters with 3-4 drawers:

Rough Dimensions:	Length:	30"
	Width/Depth:	22"
	Height:	38"

Third Semester - Fall (Pages 9)
Classes Auto 211, Auto 213, Auto 200

AUTO 213 Chassis Electrical-Electronics:

Tools in Lab – DVOM, Jumper leads, Test Light, Small Flashlight. Other tools will be specified by instructor.

AUTO 211 Automatic Transmissions:

Tools in Lab – Main tools will be supplied. Other tools will be specified by instructor at time of class.

AUTO 200 Service Floor:

Tools in Lab – All tools listed are needed to attend class. Tool carts will be checked in class.

Required Tool List

PPE

- (1) Fender Covers
- (2) Work Uniforms Shirts and Pants - Required and explained in Auto200 Syllabus
- (2) Pair of Safety Glasses
- (1) Pair of Closed toed leather Boots

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TOOL REQUIREMENTS BY CLASS

NOTE:

1. A TOOL MAY BE LISTED AS A REQUIREMENT IN SEVERAL CLASSES. IT IS ONLY NECESSARY TO PURCHASE THE STATED TOOLS ONCE.
2. UNDERSTAND THAT SOME TOOLS WILL BE USED IN MORE THAN ONE CLASS. FOR THIS REASON, IT IS IMPORTANT FOR THE STUDENT TO HAVE A TOOL CART, BAG, OR SOME WAY TO TRANSPORT THEIR TOOLS IF NECESSARY.

AUTO 111 Manual Transmissions & Drivelines

Tools in lab - no student tools required

AUTO 112 Automotive Brake Systems

Tools in lab - no student tools required

AUTO 113 Automotive Electricity and Electronics

PPE

- (1) Pair safety glasses

Screwdrivers/Torx drivers

- (4) Standard Screwdrivers #1, 2, 3, 4
- (4) Phillips Screwdrivers #1, 2, 3, 4
- (1) Torx driver set
- (2) Pocket Screw Drivers (one for spare)

Diagnostic

- (1) Small flashlight
- (1) Retractable Jumper Wire Set. (2 leads minimum)
- (1) Test light – incandescent bulb
- (1) Test light – Computer Safe Logic Probe (Automotive)
- (1) DVOM (Fluke Series 87 Multimeter or equivalent, minimum standard - should have frequency capabilities)

Pliers

- (1) Wire Stripper-Crimper Type

AUTO 114 Automotive Engines

PPE

- (1) Pair safety glasses
- (1) Pair of Closed Toe Leather Boots

Screwdrivers/Torx drivers

- (4) Standard Screwdrivers #1, 2, 3, 4
- (4) Phillips Screwdrivers #1, 2, 3, 4
- (1) Torx driver set
- (2) Pocket Screw Drivers (one for spare)

Socket Sets

- (1) 1/4" drive metric 6-point socket set metric
- (1) 3/8" drive metric 6-point socket set 8mm - 19mm (deep & shallow)
- (2) 3/8" drive spark plug sockets Flex Head -- 13/16" & 5/8"
- (1) 1/2" drive metric 6-point socket set 12mm - 24mm (deep & shallow)
- (1) 1/2" drive metric 6-point **impact** socket set - 12mm - 24mm
- (1) 1/2" drive lug nut deep well **impact** sockets - 3/4", 13/16", 19mm
- (1) Metric Allen Set
- (1) Standard Allen Set

Wrenches

- (1) Metric combination wrench set 7mm to 22mm
- (1) Metric flare nut wrench set - 6 pieces - 9mm to 21mm

Pliers

- (1) Slip Joint
- (1) Needle Nose
- (1) Side Cutter/Dyke Type
- (1) External snap ring pliers
- (1) Internal snap ring pliers
 - (1) Wire Stripper-Crimper Type

Hammers

- (1) Ball Peen 8 oz
- (1) Ball Peen 10 oz
- (1) Ball Peen 24 oz
- (1) 30 oz
- (1) Medium Dead Blow

Torque wrench

- (1) 0 to 150 ft/lb. capacity (Make sure it is as long or longer than 22 inches overall)

Measurement

- (1) 6" steel rule (1/32 & mm scale)
- (1) Steel tape measure (12 ft. long)
- (1) Flat feeler gauge set (must include a .0015 gauge)

Pry Bar

- (1) Set of 3-4 pry bars: 8", 12", 18" (an economical set is preferred)

Punches/Drifts

- (1) Punch set (5/16" center punch, ¼" starter punch, 3/16" & 5/16" pin punch)
- (1) Chisel set (3/8", ½" & ¾")
- (1) Brass drift-6"

Tool Storage

- (1) Locking Tool Cart on casters with 3-4 drawers:

Rough Dimensions:	Length:	30"
	Width/Depth:	22"
	Height:	38"

Examples:



PPE

- (1) Pair safety glasses
- (1) Pair of Closed Toe Leather Boots

Diagnostic

- (1) Small flash light
- (1) Retractable Jumper Wire Set. (2 leads minimum)
- (1) Test light – incandescent bulb
- (1) Test light – Computer Safe Logic Probe (Automotive)
- (1) DVOM (Fluke Series 87 Multimeter or equivalent, minimum standard - should have frequency capabilities)

Screwdrivers/Torx drivers

- (4) Standard Screwdrivers #1, 2, 3, 4
- (4) Phillips Screwdrivers #1, 2, 3, 4
- (1) Torx driver set
- (2) Pocket Screw Drivers (one for spare)

Socket Sets

- (1) 1/4" drive metric 6 point socket set metric
- (1) 3/8" drive metric 6 point socket set 8mm - 19mm (deep & shallow)
- (2) 3/8" drive spark plug sockets Flex Head -- 13/16" & 5/8"
- (1) 1/2" drive metric 6 point socket set 12mm - 24mm (deep & shallow)
- (1) 1/2" drive metric 6 point **impact** socket set - 12mm - 24mm
- (1) 1/2" drive lug nut deep well **impact** sockets - 3/4", 13/16", 19mm
- (1) Metric Allen Set
- (1) Standard Allen Set

Wrenches

- (1) Metric combination wrench set 7mm to 22mm
- (1) Metric flare nut wrench set - 6 pieces - 9mm to 21mm

Pliers

- (1) Slip Joint
- (1) 16" channel lock type
- (1) Needle Nose
- (1) Side Cutter/Dyke Type
- (1) 9" Channel Lock Type
- (1) 6" vise grip
- (1) 10" vise grip
- (1) External snap ring pliers
- (1) Internal snap ring pliers

Hammers

- (1) Ball Peen 8 oz
- (1) Ball Peen 10 oz
- (1) Ball Peen 24 oz
- (1) 30 oz
- (1) Medium Dead Blow

Torque wrench

- (1) 0 to 150 ft/lb. capacity (Make sure it is as long or longer than 22 inches overall)

Pry Bar

- (1) Set of 3-4 pry bars: 8", 12", 18" (an economical set is preferred)

Punches/Drifts

- (1) Punch set (5/16" center punch, ¼" starter punch, 3/16" & 5/16" pin punch)
- (1) Chisel set (3/8", ½" & ¾")
- (1) Brass drift-6"

Files

- (2) File handles
- (1) flat
- (1) 3/8" x 10" round
- (1) 3 cornered (triangle) 10"
- (1) Set of 3 of small/fine

Tire Tools

- (1) Tire gauge
- (1) Tire air chuck
- (1) Valve core removing tool

Impact

- (1) 3/8 drive of either electric or air. This can also be in either "gun" or "ratchet" style
- (1) 1/2" drive of either electric or air.

Miscellaneous

- (1) Air blow gun with rubber tip and aero fittings
- (1) Retractable Jumper Wire Set. (2 leads minimum)

Tool Storage

- (1) Locking Tool Cart on casters with 3-4 drawers:

Rough Dimensions:	Length:	30"
	Width/Depth:	22"
	Height:	38"

AUTO 117 Electronic Fuel Management Systems

PPE

- (1) Pair safety glasses
- (1) Pair of Closed Toe Leather Boots

Screwdrivers/Torx drivers

- (4) Standard Screwdrivers #1, 2, 3, 4
- (4) Phillips Screwdrivers #1, 2, 3, 4
- (1) Torx driver set
- (2) Pocket Screw Drivers (one for spare)

Diagnostic

- (1) Small flash light
- (1) Test light – incandescent bulb
- (1) Test light – Computer Safe Logic Probe (Automotive)
- (1) DVOM (Fluke Series 87 Multimeter or equivalent, minimum standard - should have frequency capabilities)
- (1) Spark Plug Tester
- (1) Vacuum Gauge
- (1) Wire Stripper-Crimper Type
- (1) Retractable Jumper Wire Set. (2 leads minimum)

Socket Sets

- (1) 1/4" drive metric 6 point socket set metric
- (1) 3/8" drive metric 6 point socket set 8mm - 19mm (deep & shallow)
- (2) 3/8" drive spark plug sockets Flex Head -- 13/16" & 5/8"
- (1) 1/2" drive metric 6 point socket set 12mm - 24mm (deep & shallow)
- (1) 1/2" drive metric 6 point **impact** socket set - 12mm - 24mm
- (1) 1/2" drive lug nut deep well **impact** sockets - 3/4", 13/16", 19mm
- (1) Metric Allen Set
- (1) Standard Allen Set

Wrenches

- (1) Metric combination wrench set 7mm to 22mm
- (1) Metric flare nut wrench set - 6 pieces - 9mm to 21mm

Pliers

- (1) Wire Stripper-Crimper Type
- (1) Slip Joint
- (1) Needle Nose
- (1) Side Cutter/Dyke Type
- (1) External snap ring pliers
- (1) Internal snap ring pliers

Pry Bar

- (1) Set of 3-4 pry bars: 8", 12", 18" (an economical set is preferred)

Tire Tools

- (1) Tire gauge
- (1) Tire air chuck

Miscellaneous

- (1) Air blow gun with rubber tip and aero fittings

Tool Storage

- (1) Locking Tool Cart on casters with 3-4 drawers:

Rough Dimensions:	Length:	30"
	Width/Depth:	22"
	Height:	38"

Auto 200 Service Floor

- All required tools with tool cart and PPE are required for this class.

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