Arizona Department of Education
Career and Technical Education
Recommended Equipment List

Program: Automation and Robotics
CIP#:   14.4201.00

NOTE: The following items and descriptions are the recommended equipment guidelines for each CTE **Automation and Robotics** program. Please note that this list of recommended items does not necessarily need to be supported financially by Federal Perkins or State Priority funding sources. In many cases, local school district funds are used to purchase items on a regular basis (i.e. furniture, consumables, etc.) Further, please understand that this is not an exhaustive list. Local program and business needs may necessitate the purchase of additional equipment and software resources, as may the rapidly-changing nature of the industryspecific technologies used in the program.

Please contact ADE-CTE Program Specialist Tracy Rexroat (tracy.rexroat@azed.gov) if you have questions regarding the appropriateness of any item you are considering for addition to your CTE **Automation and Robotics** program.

Recommended Equipment and Software

Item	Notes
Hand Tools	
• Vernier Calipers	
• Clamps	
• Extension Cords	
• Crimpers	
• Metal Files	
• Glue Gun	
• Pitch Gauge	
• Hacksaw	
• Hammer and or soft Mallet	
• Electric Heat Gun	
• Jigsaw	
• Multimeter	
• Pliers	
• Arbor Press	
• Aligning Punch	
• Bushing Punch	
• Centre Punch	
• Scriber	
• Socket Set	
• Soldering Iron	
• Square	
• Screwdrivers	
• Tape measure or Ruler	
• Toolbox	
• Vise Grips	
• Small Vise	
• Bench Vise	
• Hex/Allen Wrench	
• Set SAE / Metric Wrenches	
• Open-end Wrenches	
• Soldering Gun	
• Welder	
Power tools	
• Cordless drill and recharger	
• Hand drill (cord or battery	
• Drill press	

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Item	**Notes**
Hand tool specifics	
* 16-ounce ripping hammer with heavy duty fiberglass handle	
* 9-inch, aluminum torpedo level	
* 3/4-inch wide by 16-foot long tape measure	
* Heavy-duty zinc utility knife with rubber grip	
Wrenches:	
* 16pc hex key set (Allen wrenches). eight metric and eight English sizes.	
* 6-piece combination wrench set with steel clip	
Pliers:	
* 8-inch needle- nose pliers with wire-cutting blades (meets or exceeds ANSI standards)	
* 8-inch diagonal pliers (meets or exceeds ANSI standards)	
* 8-inch groove-joint pliers (meets or exceeds ANSI standards)	
* 7-inch nickel-coated locking pliers	
* wire cutters	
Screwdrivers:	
kit includes a ratcheting handle with a selection of interchangeable bits to provide an exceptional array of screwdrivers in all sizes and head shapes.	
* 14 flat head: 4, 5, 6, and 7 mm and 3/32-, 1/8-, 5/32-, 3/16- (x3), 7/32-, and 1/4- (x3) inch	
* 9 Phillips head: 1x2, 2x5, and 3x2	
* 3 square head: S1, S2, and S3	
* 10 star head: T6, T7, T8, T10, T15, T20, T25, T27, T30, and T40	
* 10 hex: 3, 4, 5, 6, and 7 mm and 1/8-, 5/32-, 3/16-, 7/32-, and 1/4-inch	
* 4 Pozidriv: PZ0, PZ1, PZ2, and PZ3	
* 14 nut drivers	
Electronic Equipment	
Computers/ laptops- full set and or I-pads mix and match as needed	

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Recommended Equipment and Software	
Item	**Notes**
Design software	
• Multimeter- as needed-	
• Oscilloscope- limited	
• Variable power supplies: power supplies with variable output.	
• Signal generators- limited quantities	
• Logic probe- limited quantities	
• power analyzers - limited quantities	
• Frequency meters - limited quantities	
• LEDs/ Voltmeter	
Precision measurement tools	
Curve tracers	
Digital calipers	
Bench and handheld Digital Volt-meter (DVM)s	
DMM's (digital multi-meter),	
Oscilloscopes (analog and digital),	
Testing equip (electronic above)	
Industrial Inspection Zoom Monocular Microscope with screen and optional camera	
Sensors- pressure, magnetic, resistive, capacitance, photo electric	
PLCs	
Motors	
Actuators	
relays	
IC controllers	
Breadboard	
switches	
Printed circuit boards PCBs	
Power supplies	
Programmable manipulators	
1 cartesian	
(2) gantry	
(3) cylindrical	
(4) spherical	

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Recommended Equipment and Software	
Item	**Notes**
(5) articulated	
(6) SCARA	
Robot controls	
1 Point to point (PTP)	
2 Continuous Path control	
3 Controlled path control	
Automation and programming control tools	
Programable Computer Numeric control	
Direct Numeric Control DNC	
Printed Circuit Boards (PCB's)	
computer-integrated manufacturing (CIM)	
HMI software	
PAC, PLC and controllers software	
*Must meet the guidelines for specialized computing equipment as outlined on the "CTE Equipment Guidelines" at www.azed.gov/cte/grants	