DTECH APPRENTICESHIP SKILLS

A student can earn GRAND MASTER status by creating an advanced project that synthesizes most of the skills in this chart. A GRAND MASTER must be a MASTER in all seven skills before they can petition for GRAND MASTER status.

	NOVICE	JOURNEYMAN	MASTER
CAD	❑ Set document properties ❑ Extrude ❑ Use dimensions ❑ Pass first two modules of Onshape fundamentals course	❑ Complete the entire Onshape fundamentals course and receive certification ❑ Export a variety of file types for specific uses (.stl and dwg)	❑ Create multi-part drawings with movable assemblies ❑ Accurately dimension objects for laser / 3D print / CNC ❑ Teach others (publish work)
3D Printing	❑ Pass safety test ❑ Import an .stl into Cura from Onshape ❑ Print with help from others ❑ Remove object safely	❑ Independently print a design from Onshape ❑ Scale objects appropriately for use case ❑ Adjust settings for filament plastic type and diameter in expert settings	❑ Create multi-part objects that fit / click / slide / move together ❑ Adjust expert settings to fit the scenario ❑ Repair / service the 3D printers ❑ Teach others (publish work)
Laser Cutting	❑ Pass safety test ❑ Know the difference between raster and vector ❑ Engrave text and / or an image on a pre-cut stock with help ❑ Focus the laser	❑ Raster multiple types of materials ❑ Vector cut multiple types of materials and thicknesses ❑ Laser a self-generated drawing in Inkscape or Illustrator ❑ Export the drawing and accurately adjust the laser properties to fit the job ❑ Move X/Y Axis and set new origin	❑ Master the entire laser workflow with no mistakes ❑ Cut and engrave during the same job ❑ Use the "Color Map" feature to vector cut using different power / speed levels ❑ Create interlocking 3D objects ❑ Use the K40 lasers ❑ Teach others (publish work)

Electronics	❑ Pass safety test ❑ Setup a basic DC circuit with an LED ❑ Be able to define: voltage, current, resistance, AC, DC, solder	❑ Create a program and run it on a Circuit Playground Express or Arduino ❑ Solder two wires together and test for continuity ❑ Use a multimeter to measure voltage of a power source	❑ Create an advanced electronic project integrating motors, LEDs, sensors, etc. with a program (code) ❑ Solder components onto circuit boards ❑ Teach others (publish work)
CNC / CAM	❑ Pass safety test ❑ Explain relationship between bit size and carved image ❑ Use Easel and / or Carbide Create to simulate a basic 2D carve ❑ Generate a simple toolpath using a custom design	❑ Independently set up a carve using Easel and Carbide Create ❑ Create a finished carving from start to finish safely without intervention ❑ Mill a text sign for the school / DTech Lab	❑ Create a 3D carve using advanced CAD-CAM techniques and programs like Fusion 360 and Meshcam ❑ Innovates by using multiple tools and toolpaths on one carve ❑ Create roughing and finishing passes ❑ Teach others (publish work)
Publishing Vinyl Cutter Large Printer Dye Sublimation	❑ Pass all safety tests ❑ Make a basic vinyl cut ❑ Make a color print using the paper roll on the Canon printer ❑ Can do basic graphic design in Photoshop / Illustrator / Inkscape	❑ Create custom (self-designed) sticker on the vinyl cutter from start to finish ❑ Use the dye sublimation printer to transfer design to another object ❑ Can load new paper and print using several different settings on the Canon	❑ Make a large, complex vinyl sticker ❑ Sublimate onto novel surfaces ❑ Create professional published posters / photos using the Canon printer ❑ Teach others (publish work)
Silkscreen	❑ Pass safety test ❑ Can write down the basic silk screening steps without aid ❑ Has the step-by-step printed guide for reference	❑ Make a series of T-shirts using custom created artwork with the photo emulsion method of screen printing ❑ Maintains a clean working environment ❑ Can clean and reclaim screens	❑ Make a multi-color print with proper screen registration ❑ Can make 20+ shirts with excellent quality control ❑ Tried silk screening on other materials ❑ Teach others (publish work)