



12-Week Level 3 Program Overview

(Updated 2/13/2017 - SMT)

Level 3 Overview

1. Welding Sculpture
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3. CAD Design concepts 1 – Reverse Engineering
4. Maker Beam Project
5. Arduino Motors and Sensors
6. Robotics Basics
7. Model Finishing and Painting Techniques
8. Model Finishing and Painting Techniques
9. Intermediate Silicone Molding using 2-part molds
10. Wood Shop Basics - Intermediate
11. Wood Shop Project – Hardwood vintage Style Skate Board Deck
12. Wood Shop Project – Hardwood vintage Style Skate Board Deck

Weeks 1 & 2: Welding Metal Sculpture

Activity: Week1 – Students get a brief refresher on metal and welding shop equipment. Samples of metal sculptures will be provided and then they will be shown where they can find scrap metal around the shop. Kids will forage for materials and start to figure out what they are going to make as they cut out and prep material for welding. Students can start welding if their ideas come together quickly. Week 2- should be primarily weld prep, welding and post weld clean up (deburring, grinding, shaping). Students will MIG and spot weld together pieces as needed to make a cool little sculpture. Hand or spray paint when done if desired.

Tools required: MIG welder, wire brush, files, snips, metal shop access to large tools, hammers, saws

Week 3: Autodesk Fusion 360 Software Intermediate – Reverse Engineering Techniques

Activity: Work in classroom with overhead projector to show them how to measure an existing part and determine critical dimensions for modeling in CAD software. This will include demonstrating measuring methods, measuring tools and a refresher how to create a new part model in Fusion 360. Students will learn about how parts fit together in an assembly and why tolerances are important to manufacturing.

Tools required: Free downloaded software from Autodesk, a laptop and overhead projector

Kids prep / supplies: Kids to bring their own laptops. Please preinstall software.

Week 4: Maker Beam Building

Activity: Challenge students to build a unique mechanical structure using the 80/20 extrusions and fasteners. Encourage them to use their imagination. Some examples could be: robot structures, buildings, cars, planes, anything that requires a mechanical frame.

Tools required: Maker beam kits, allen wrenches, nut drivers

Week 5: Arduino – Motors and Sensors

Activity: Use Arduino micro controller with sensors and servo motors. Learn intermediate techniques using the Arduino Integrated Development Environment (IDE) to control servos, read position data and react to inputs.

Tools required: Assorted electronics hand tools including: wire strippers, crimpers, scissors, heat gun, soldering iron, multi-meter (Use 1 UW premade tool box per 2 kids), assorted hand tools (Use UW premade hand tools tool box)

Materials required: Urban Workshop Arduino kits

Kids prep / supplies: Bring their own PC based laptops. Pre-install Arduino software.

Week 6: Arduino – Basic Robotics with Arduino

Activity: Use Arduino micro controller with sensors and servo motors to sense, react and control a robotic finger based on the In-moov Robot. Learn intermediate techniques using the Arduino Integrated Development Environment (IDE).

Tools required: Assorted electronics hand tools including: wire strippers, crimpers, scissors, heat gun, soldering iron, multi-meter (Use 1 UW premade tool box per 2 kids), assorted hand tools (Use UW premade hand tools tool box)

Materials required: Urban Workshop Arduino kits, In-moov finger kit, servo motors, actuation cable, wire, shrink wrap.

Kids prep / supplies: Bring their own PC based laptops. Pre-install Arduino software.



Week 7 & 8: Paint and Finishing Techniques

Activity: Kids will prep and paint plastic squirt guns using advanced painting techniques to achieve vintage appearance like the in the movies. Techniques learned apply to Cosplay and Steampunk projects.

Tools required: Brushes, rags, sponges, paint cups, water cups,

Materials required: Squirt guns, acrylic paints, primer, go-gone, masking tape, rub & buff, primer, Cosplay style embellishments, metallic paints, Mod-Podge Matte Lacquer spray, E600 glue (small tubes), gears and junk,

Week 9: Intermediate Silicone Molding – 2-Part Molds

Activity: Students will make a two-part mold of a provided part and pour their own copy of it. Topics will include part draft, part lines, release agents and model prep, and mold box preparation for 2 part molds. Once cured they will demold and trim the part.

Tools required: Gram scale, scissors, mixing cups, stirrers, rags, gloves, 4" PVC pipe caps

Materials required: Silicone molding kits, mold release, mold box acrylic strips, ¼" hex nuts for alignment pin

Week 10: Wood Shop Basics

Activity: This the same class our adults take to get signed off in the Urban Workshop wood shop. Students will use all of the professional wood shop machines while learning how to setup, adjust, use, and clean up. This class will give students the skills and confidence to use professional level equipment for any project.

Tools required: Full size professional woodshop equipment including table saw, miter / chop saw, jointer, shaper, band saw, table router, spindle sander, horizontal oscillating belt sander, drill press and planer.

Materials required: Misc. scrap wood for practice.

Week 11 & 12: Wood shop – Hardwood Vintage Style Skateboard Deck

Activity: Use basic and powered shop tools to make a hardwood cruiser skateboard deck. Week one cut and prepare all materials and perform glue up of board. Week 2 complete assembly, perform finishing using wood shop equipment, and add clear coat finish.

Tools required: Wood shop professional tools, powered hand router with bits, file, sand paper, hammer, clamps, brushes, polishing wheel / pads

Materials required: Dark & light colored wood. Glue, clear coat, polishing compound

Please Note:

These class topics, activities and descriptions are all subject to change at any time without notice.