

## **CEID Equipment List**

Electronics Station Equipment:

The CEID electronics stations (2 stations) each have the equipment in the list below. Each station gives students the capability to assemble prototype circuits on breadboards and PC boards, and to evaluate, test, and debug the circuits using a variety of diagnostic equipment.

RIGOL DS1102D Digital Oscilloscope

RIGOL DP1308A Programmable DC Power Supply

RIGOL DG1022A Function/Arbitrary Waveform Generator

Weller WES51 Soldering Iron

Weller WSA350 Smoke Absorber

Panavise Circuit Board Vise

Aoyue Int 2702A Repairing System for soldering/desoldering

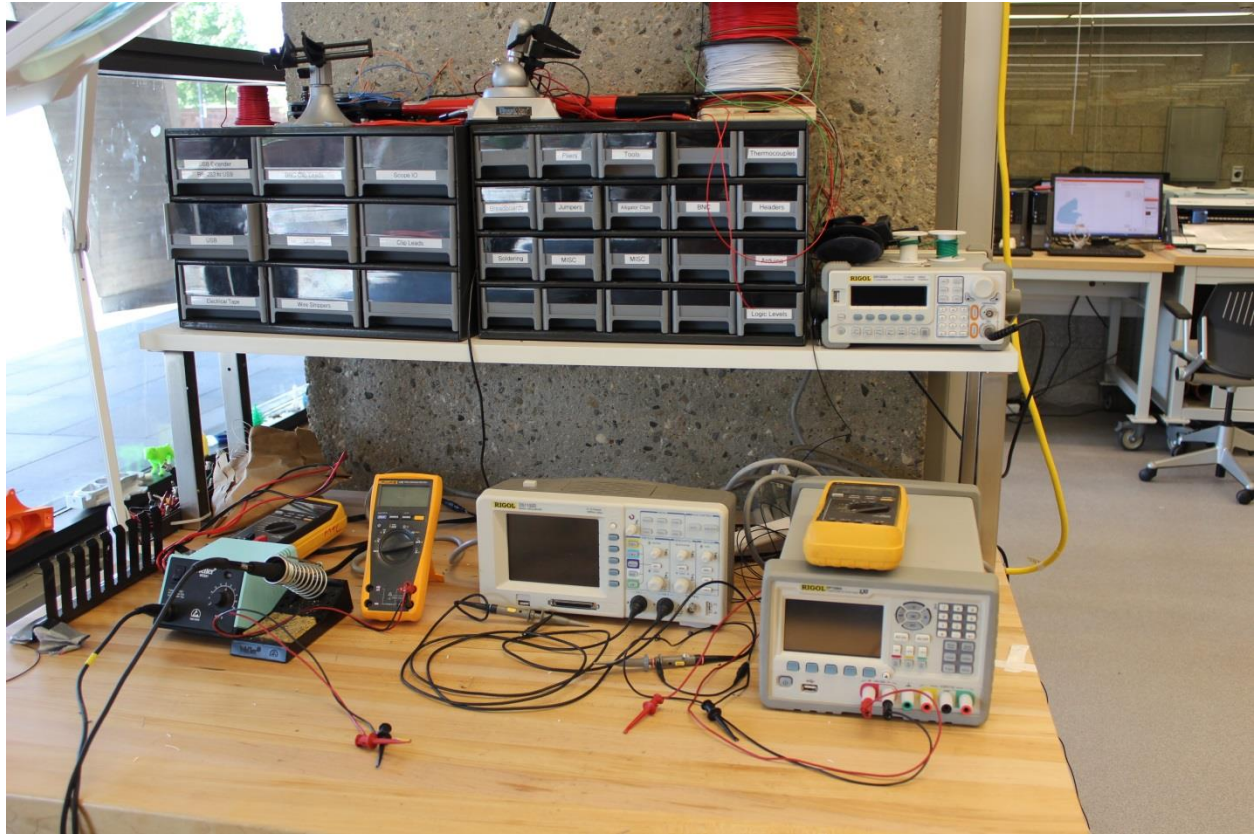
Fluke 179 True RMS Multimeter

HP 973A Multimeter

Prototyping Breadboards

Arduino hardware

Electronics components (resistors, capacitors, transistors, op amps, LEDs, servos, sensors, etc.)



**Wetlab Equipment:**

The CEID wetlab has equipment that is designed to serve a variety of different purposes.

One purpose is to facilitate genetic engineering techniques using e-coli. Polymerase reactions may be run and the results may be analyzed using spectroscopic techniques and electrophoresis. The following instruments are useful for this purpose:

Fischer Scientific Isotemp controlled temperature bath

Fischer Scientific accuSpin Micro 17 centrifuge

Branson 2510 Ultrasonic Cleaner

Oakton ION 2700 pH/mV/Ion/temperature meter

Fischer Scientific Vortex Mixer

Denver Instrument SI-114 Balance

Whirlpool Microwave WMC20005YD-0

MaestroGEN LB-16 UV transilluminator

Unico 2800 UV/VIS Spectrophotometer

Fischer Scientific General Purpose Refrigerator/Freezer

Fischer Scientific Isotemp Incubator

BioRad T100 Thermal Cycler

Fischer Scientific Model 664 Oven

Fischer Scientific SterilElite 16 Autoclave

BioRad GelDoc EZ Imager

AMG Evos Fl Fluorescence Microscope

New Brunswick Scientific Excell E24 Incubator Shaker Series

Corning PC-420D Hot Plate

Fischer Science Education Balance

BioRad Sub-Cell GT Agarose Gel Electrophoresis Apparatus

Fischer Scientific Mini Centrifuge

Fischer Scientific Mini Roto S56 Mixer

Gilson Pipetters

Hamilton SafeAire II Fume Hood

Bioforces nanosciences UV Ozone Procleaner

A second purpose is to support work in microfluidics, including both the standard variety using pdms molds as well paper microfluidics more suited to diagnostics for the developing world. The following pieces of equipment support this type of research and engineering.

Technical Innovations MHPM-UMV Schmidt Press

Specialty Coating Services 6800 Spin Coater

Vacuum Pump

Vacuum Desiccator

Xerox ColorQube 8570

Nikon T1-SM Microscope

Nikon SMZ 745T Microscope

NCL 150 Fiber Optic Illuminators

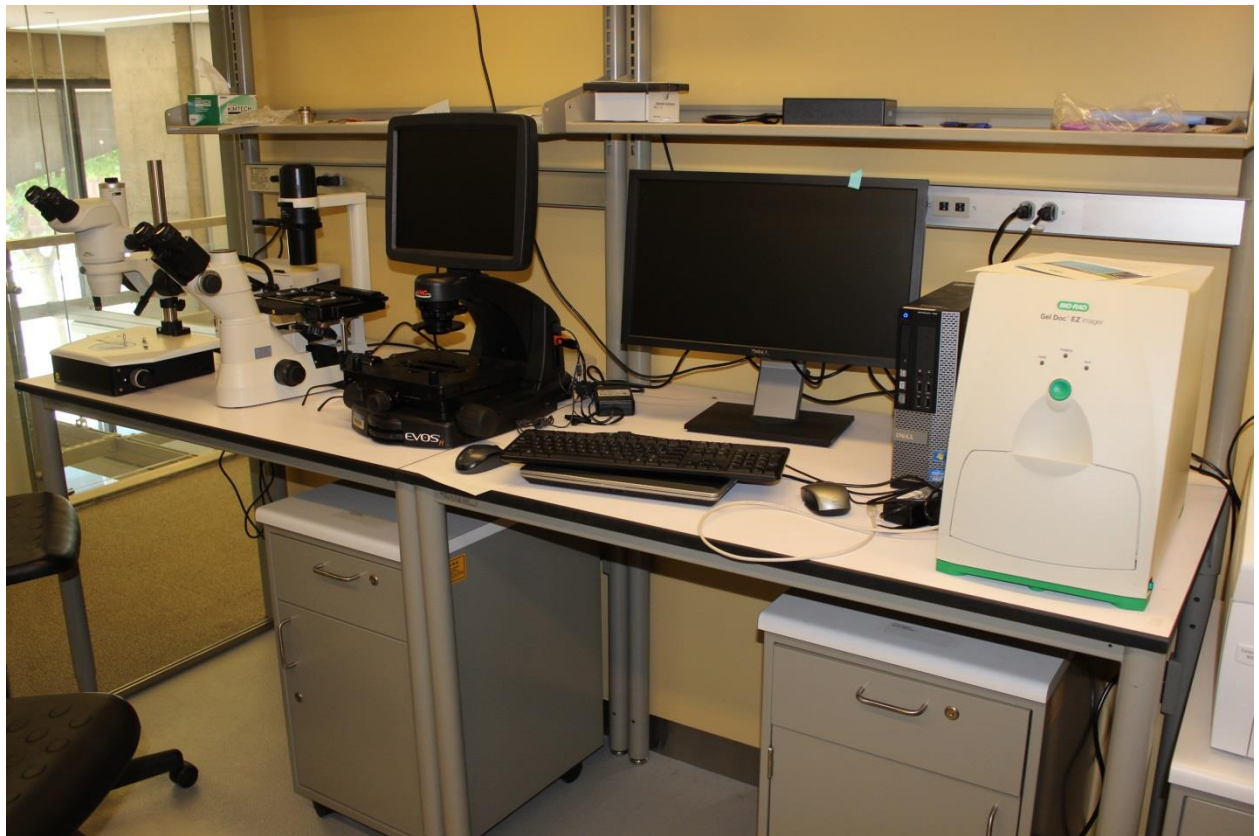
Hamilton SafeAire II Fume Hood

A third purpose is to house instruments that are used to remove support material from parts produced by our Dimension and Objet 3D printers.

SCA Support Cleaning Apparatus controlled temperature bath for Dimension parts

Karcher Water Jet Apparatus for Objet Parts

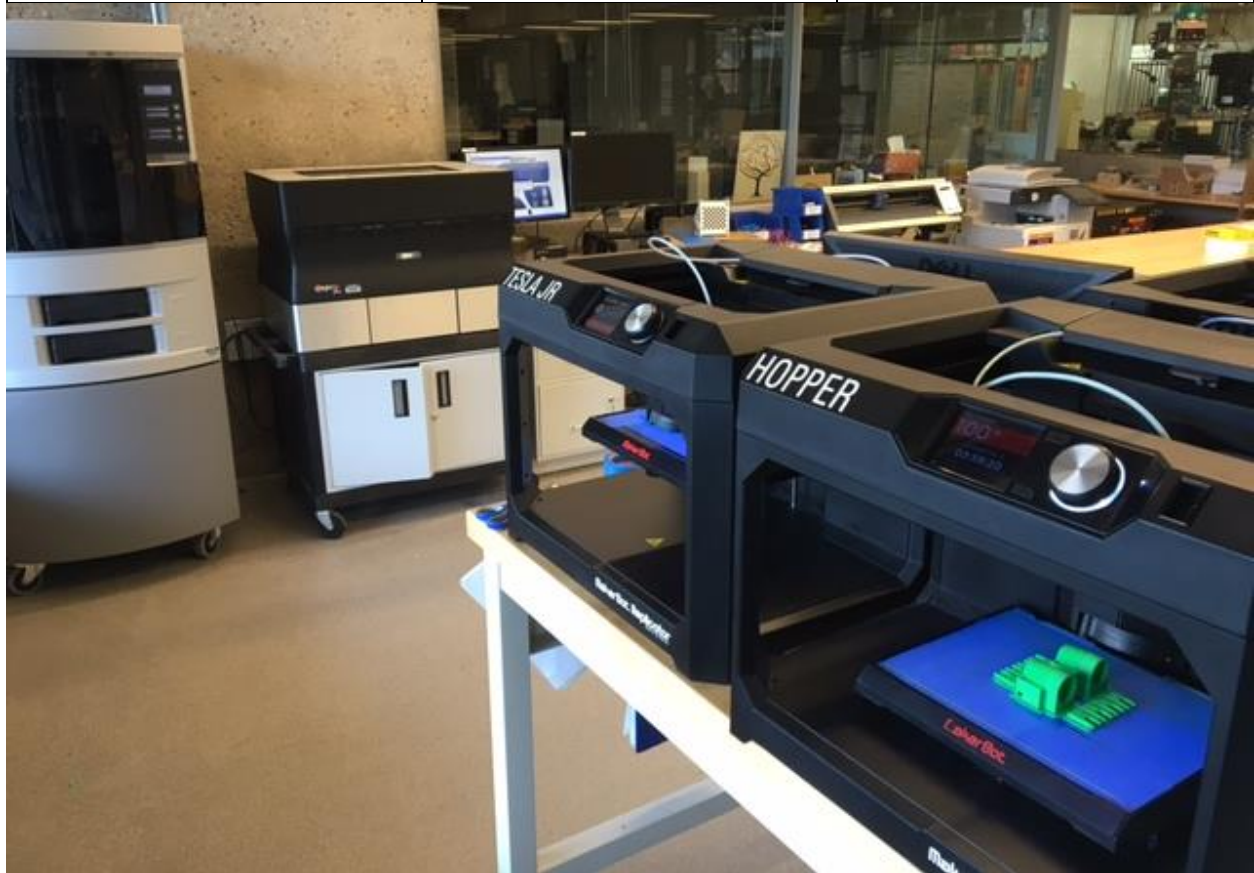




### CEID Studio Equipment List:

These include our 3-D printers and hand tools.

Equipment	Amount	Description
Aticio MP C300	1	printer
Camm-1 Servo	1	Vinyl cutter
Dell	5	computer
Mac	2	Computer
Objet 30 Pro	1	3d printer
Dimension Elite	1	3d printer
Makerbot 5 <sup>th</sup> Gen. Replicator	3	3d printer
Milwaukee 3.8" Right Angle Drill	1	Right angle drill
Milwaukee M18 Red Lithium	2	18 volt impact driver
M18 Red Lithium Drill	3	Drill
Milwaukee HackZall	1	Reciprocating Saw
Milwaukee Jig Saw	1	Jig Saw
Dremel 4000	2	Dremel tool
Janome Model HD-1000	1	Sewing Machine
Canon EOS Rebel T3i	1	Camera







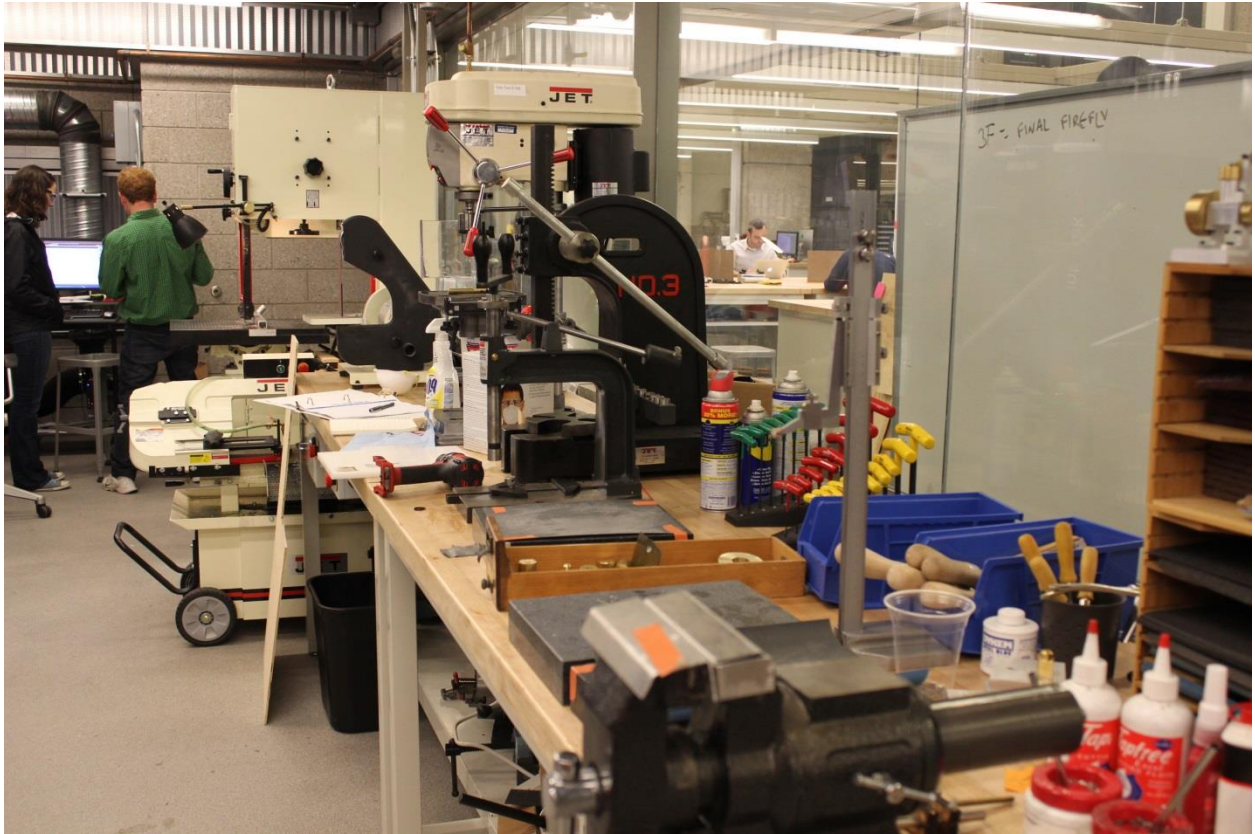
**CEID Machine Shop List:**

These are the tools in the metal and wood shops.

Equipment	Amount	Description
ULS Laser Cutter 4' x 2'	1	Laser Cutter
Intelitek Promill 8000	1	CNC Mill
Jet VBS-2012	1	Vertical Landsaw
Jet Beltsander	1	Belt Sander
Jet JDP-12	1	Drill Press
Jet AP-3	1	3-ton Arbor Press
Dayton 2XUVS	1	Hand Tipper
Jet J-A5816	1	Drill Press
Jet JBG-8A	1	Bench Grinder
Jet J-4206A	1	Belt Sander
Clausing EUS 08	2	Mill Machine
Clausing M300	2	Lathe
Shopbot PRS Alpha	1	4' x 4' CNC milling/routing
Jet JBOS-5	1	Oscillating spindle sander
Formech DT508	1	Thermoformer
Labconco	1	Fume Hood
Jet JMS-10SCMS	1	Sliding Compound Miter Saw







## CEID Sheet Metal Tools Inventory

These tools are in the CEID sheet metal area.

Instrument	Amount	Description
DI-ACRO Model No. 12SR	1	Slip Roller
DI-ACRO Model No. 24 Finger Brake	1	Bender
Tin Knocker	1	Hand Turret Punch
DI-ACRO Model No. 24HS	1	Sheer
DI-ACRO Model No. O2TN	1	Notching machine



