



# ICD LEARNING SUMMIT

## 2017



## ICD and Advanced Manufacturing



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What is Advanced Manufacturing?



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**Advanced Manufacturing:** Use of innovative technologies to create existing products and the creation of new products. Advanced manufacturing can include production activities that depend on information, automation, computation, software, sensing and networking.

*According to: Manufacturing.gov*



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Tuition Assistance programs that relate to  
Advanced Manufacturing



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Many universities and community college are offering training in Advanced Manufacturing.

Do you know what's offered in your area?



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Example:

Cuyahoga Community College  
Cleveland, OH



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## Cuyahoga Community College

0-3 month programs that earns a Certificate of Completion for each class.

4-12 months, earns a Short-Term Certificate

1 year plus, earns an Associates Degree



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Cuyahoga Community College

0-3 months, Certificate of Completion

Computer Aid Design

Manufacturing Technical Readiness Program

Precision Machining Technology

Siemens Mechatronic System Certification





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Cuyahoga Community College

4-12 months, Short-Term Certificate

CNC Machining and Composites Manufacturing—27 Credit hrs.

Digital Manufacturing & Product Launch-16 Credit Hrs.

Digital Design & Product Innovation-16 Credit Hrs.



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Customized Classes that relate to  
Advanced Manufacturing



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## **Additive Manufacturing:**

The construction of complex three-dimensional parts from 3D digital model data by depositing successive layers of material. The names of specific additive manufacturing technologies include: 3D printing, layered object manufacturing, selective laser sintering, selective laser melting, LENS, stereolithography, and fused deposition modeling.



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## ICD Customized Class (2016)

### 3D Printing

Number of classes: 5

Average training hours: 9.2

Average cost per person: \$246.88

Average number of participants per class: 5.4



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3D Printing

Locations represented in the class

USW/ArcelorMittal – Burns Harbor

USW/Bridgestone – Bloomington

USW/US Steel – Fairfield, Gary & Mon Valley



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### **Computer Numerical Control (CNC):**

The digital control of a physical machine that consists of a series of integrated actuators, power electronics, sensors, and dedicated computer running under a real-time operating system.



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ICD Customized Class (2016)

Computer Numerical Control (CNC)

Number of classes: 7

Average training hours: 11.7

Average cost per person: \$345

Average number of participants per class: 7.14



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CNC

Locations represented in the class

USW/US Steel – Granite City & Great Lakes

\*Classes made some type of project via router or plasma cutter.





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## **Computer-Aided Manufacturing:**

Computer-aided manufacturing (CAM) often refers to software that takes the geometric design authored with CAD software as input and outputs manufacturing instructions that are downloaded to automated equipment such as a computer numerically controlled (CNC) machine tool. Is also referred to as computer-assisted manufacturing.



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## ICD Customized Class (2016) Computer-Aided Design (CAD)

Number of classes: 3

Average training hours: 33

Average cost per person: \$548

Average number of participants per class: 5.3



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Computer-Aided Design (CAD)  
Locations represented in the class

USW/ArcelorMittal – Steelton

USW/Goodyear - Topeka

USW/US Steel – Mon Valley



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Other Customized classes that could be considered Advanced Manufacturing:

Computer Networking

Fiber Optics

Hydraulics

Industrial & Advanced Welding

Industrial & Modern Electronics

Maintenance Technician Electrical



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## Panel Discussion

Instructors, Equipment, Facility, Cost, Barriers,  
and Participant Interest



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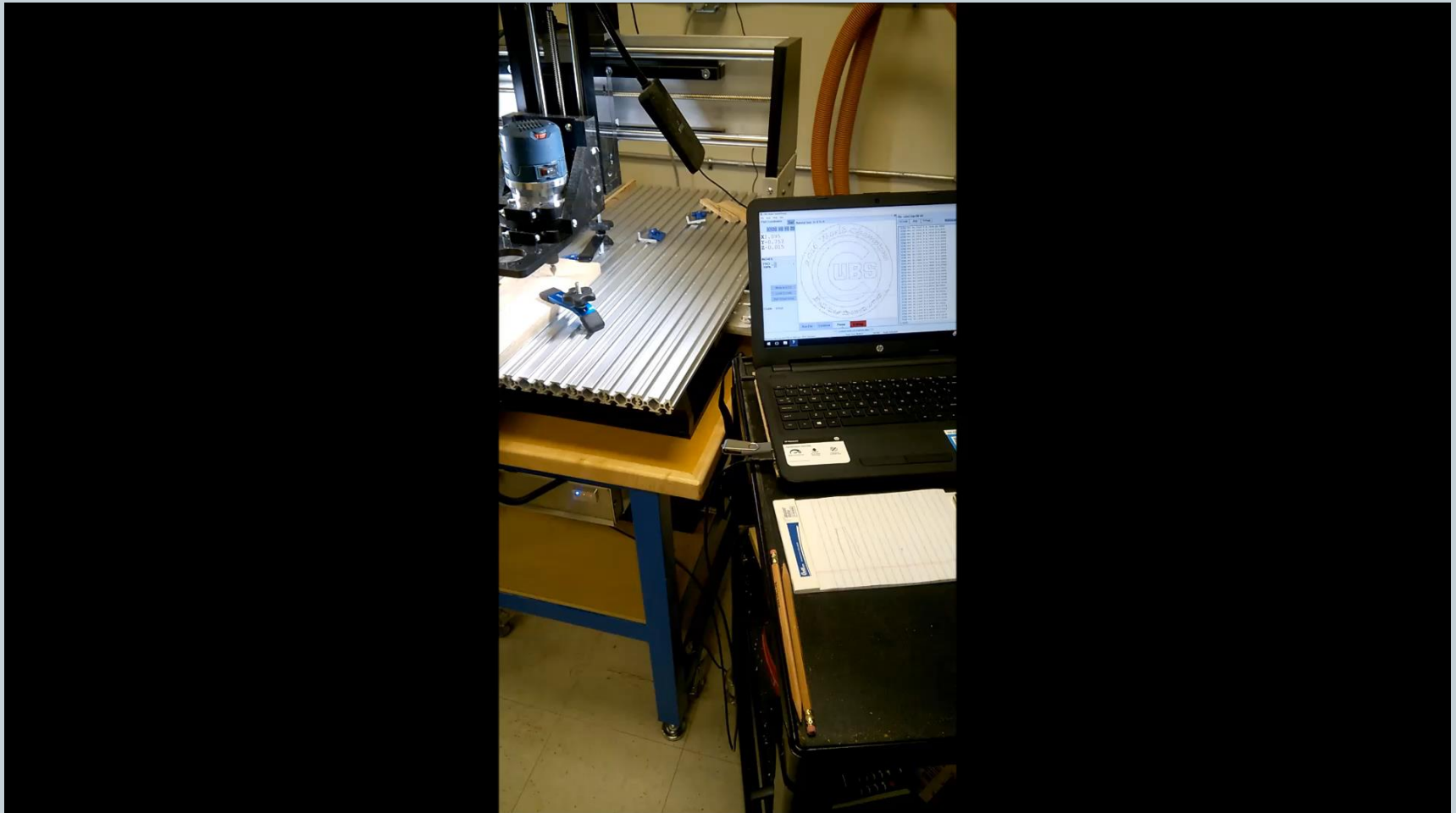
USW/U.S. Steel-Granite City

Marshall McElroy

CNC Classes

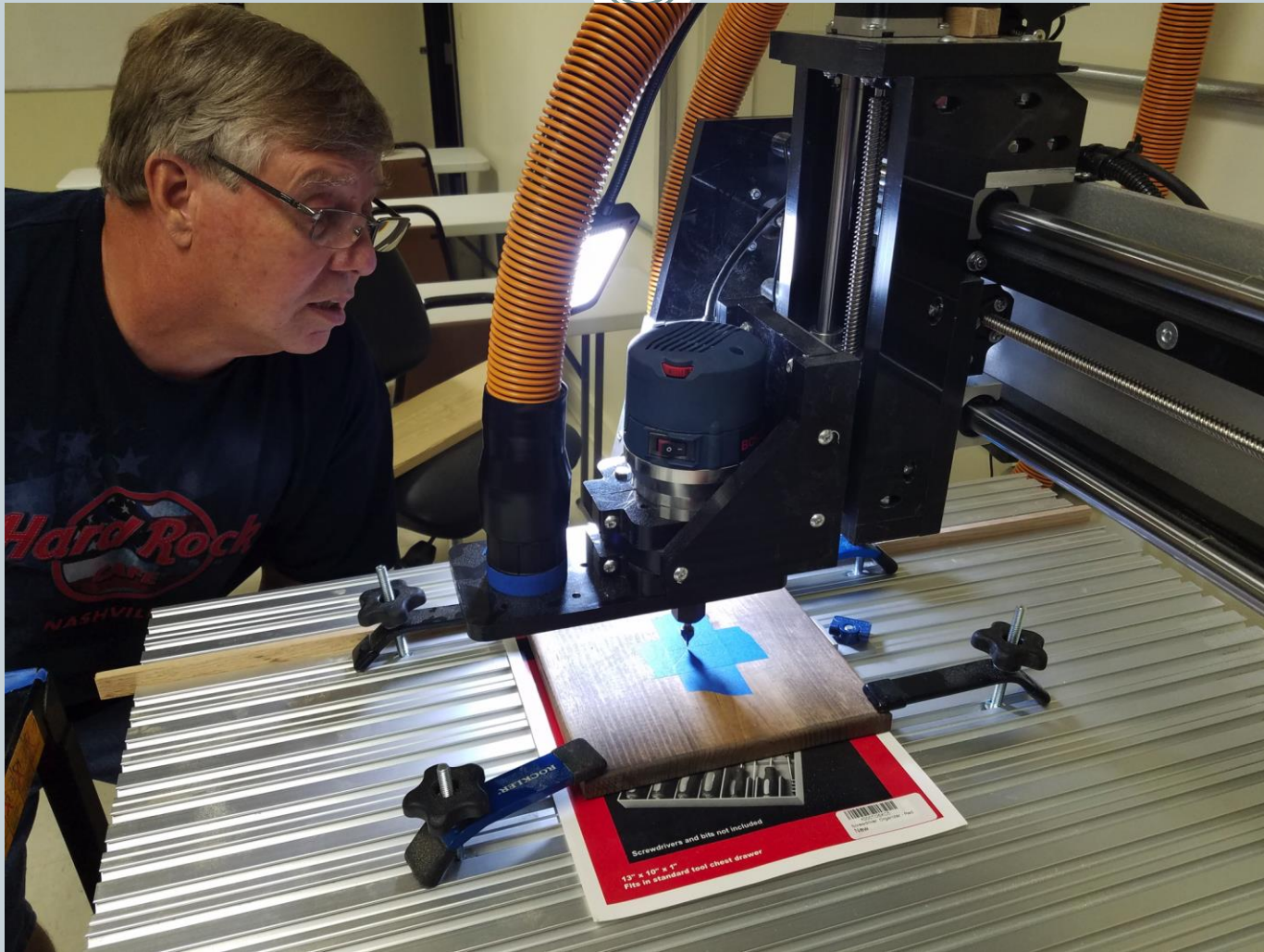
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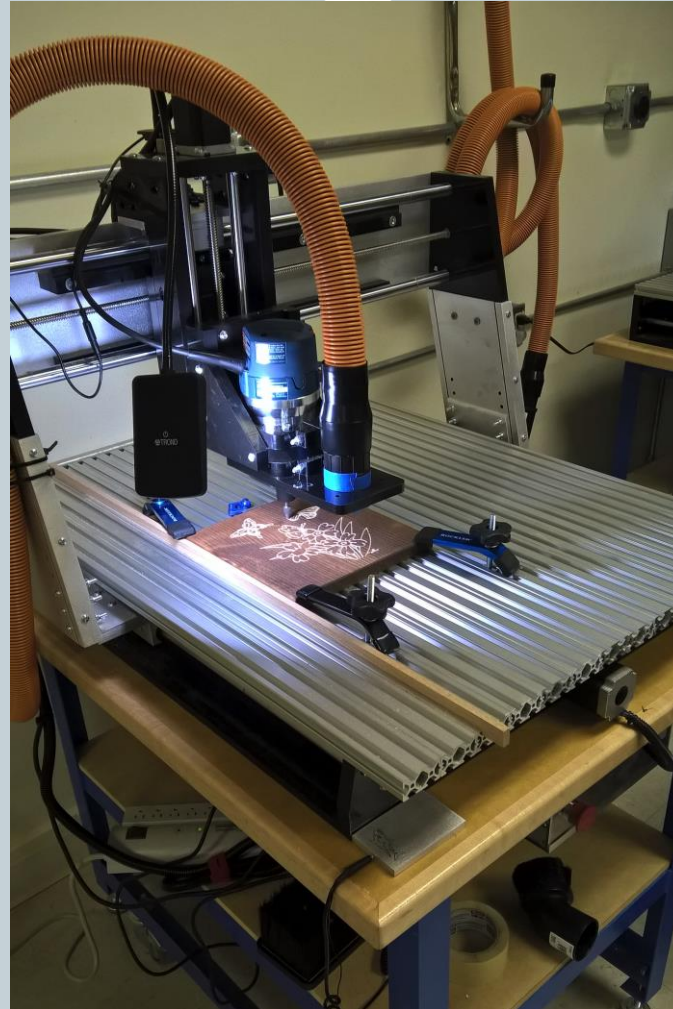
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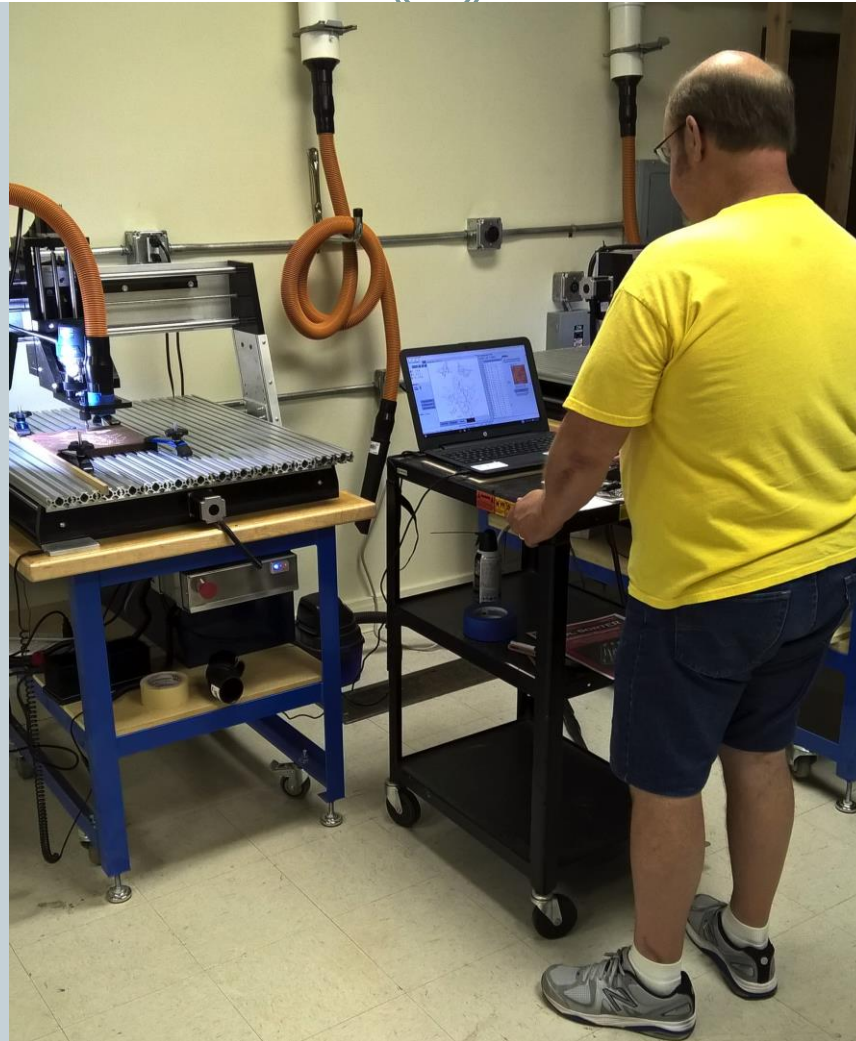
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USW/Bridgestone-Bloomington

Rick Wills

3D Printing Classes

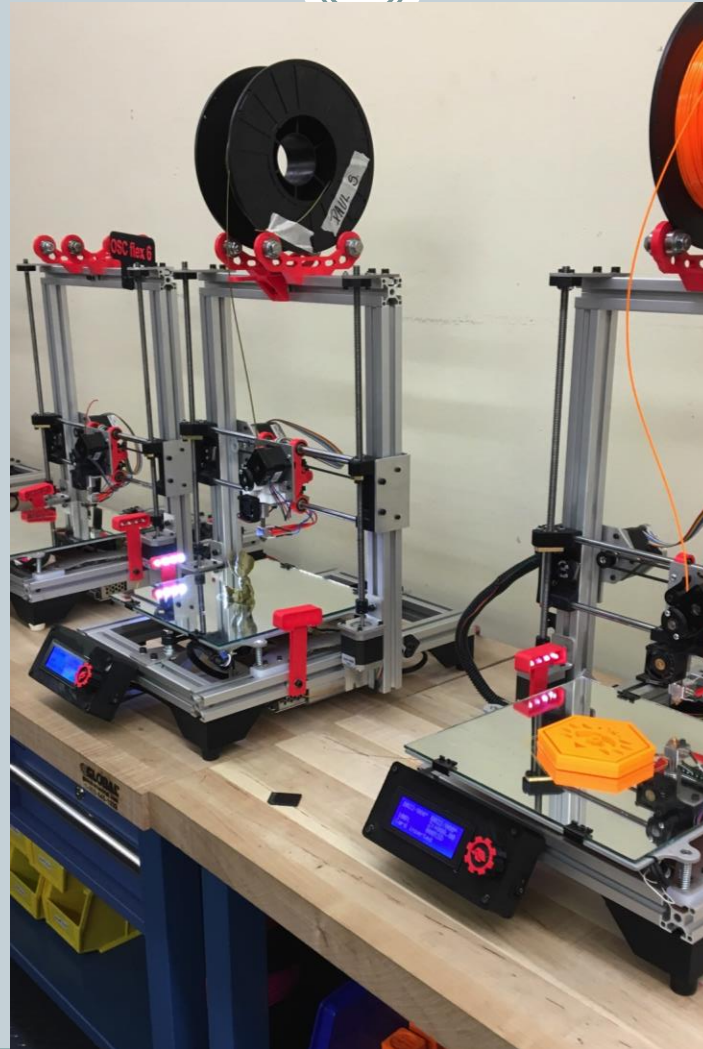
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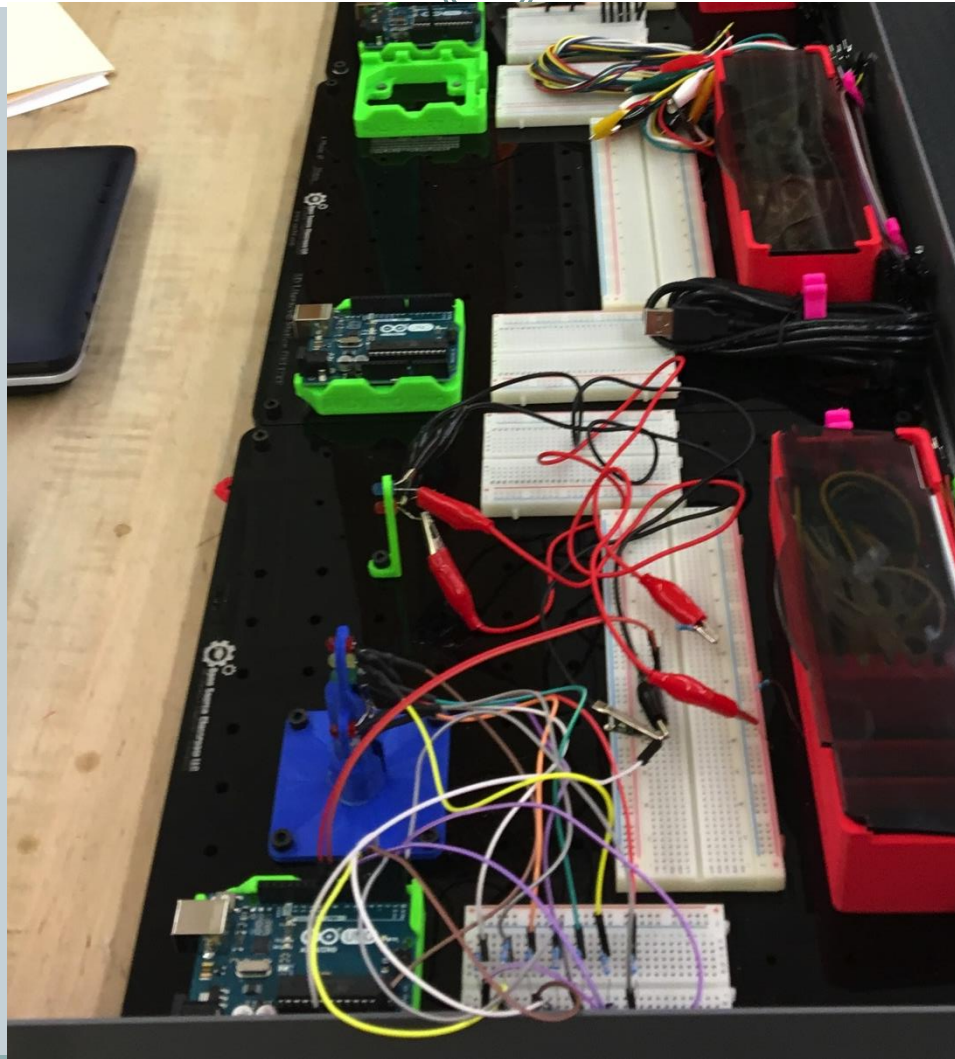
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