

Virtual PD Workshop 7/22/20

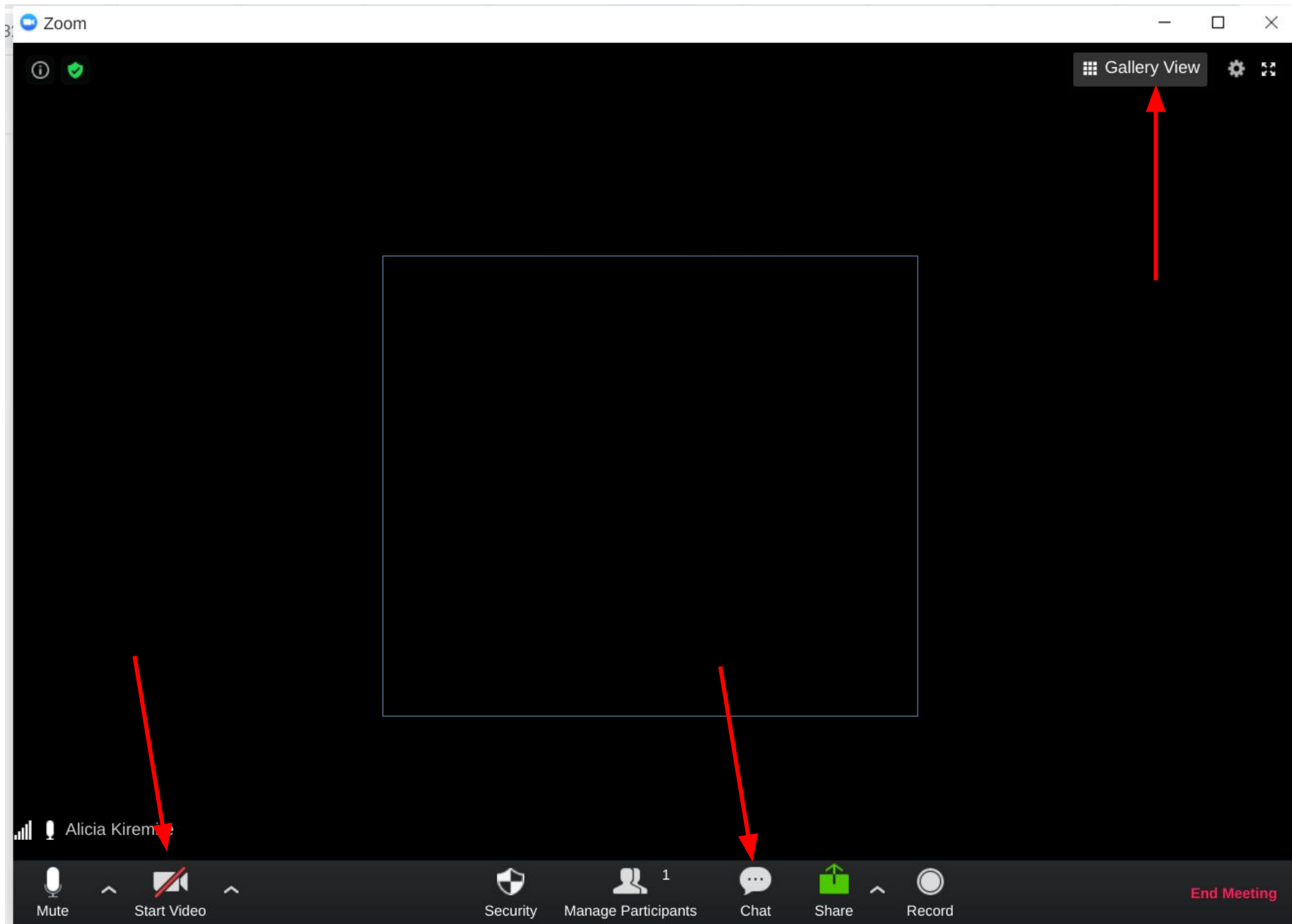


Please "sign in" with your name and school in the Chat Box! (click Chat at the bottom of your zoom window)



DISCLAIMER & USAGE

- This material is based upon work supported by the National Science Foundation's Advanced Technological Education Program under Grant No. 1801177.
- Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



-COMPLETE ->

- Mr. Gerry Caskey, Grant PI, LDCC
- Ms. Alicia Kiremire, Program Manager
- Mr. Marvin Nelson, BPSTIL Partner Teacher
- Dr. Mikey Swanbom, Curriculum Team, LA Tech
- Ms. Wendi Plants, Bossier Parish CTE Coordinator

- Project COMPLETE Overview
- What's in Your Kit?
- Implementing at Your School
- Q&A

Project COMPLETE Overview



What is instrumentation?



Measures a physical characteristic like temperature

Controlling the characteristic using a setpoint

Instrumentation + Control =
Automation

Complete system with no* human interaction



More examples of
automation in your home
or everyday life?

The Four Industrial Revolutions

The 1st Revolution

Mechanisation, **steam** power,
1784 first mechanical weaving loom.



1800

The 2nd Revolution

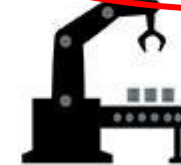
Mass production, assembly line,
electrical energy.
1870 first production line - Cincinnati slaughterhouses.



1900

The 3rd Revolution

Automation, **computers** and **electronics**.
1969 first programmable logic controller - Modicon 084



2000

The 4th Revolution

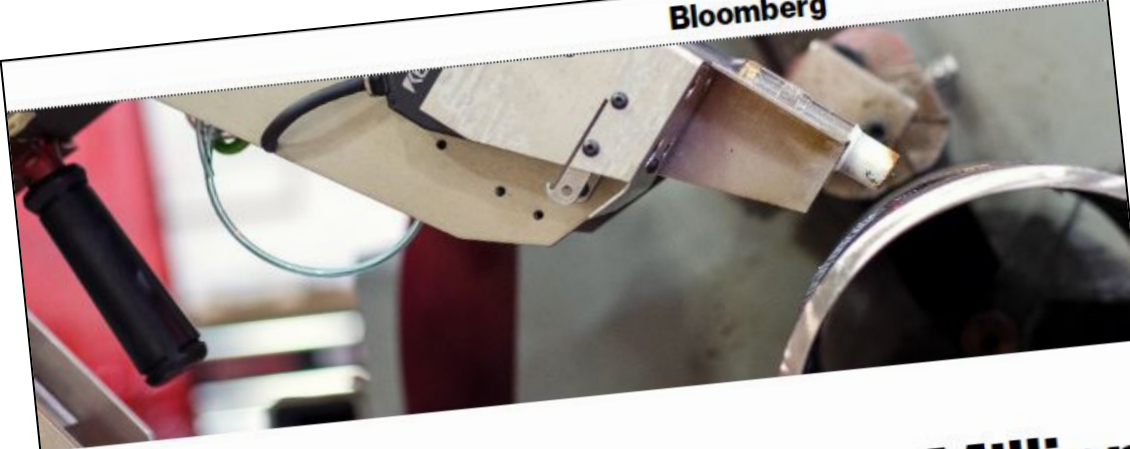
Cyber-physical systems, IoT, networks.



Today

Image from: www.betasolutions.co.nz

Bloomberg



Economics

Robots May Displace 20 Million Manufacturing Jobs by 2030

By Catherine Bosley

June 25, 2019, 6:00 PM CDT

- ▶ Lower-income areas in developed nations are most at risk
- ▶ Services jobs for displaced workers are also being taken over

Robots are on track to wipe out almost a tenth of the world's manufacturing jobs with the brunt borne by lower-income areas in developed nations, Oxford Economics says.

LISTEN TO ARTICLE

▶ 2:27

Forbes

Billionaires

Innovation

Leadership

Money

Consumer

Industry

Life

28,215 views | Sep 18, 2018, 08:05am

Artificial Intelligence To Create 58 Million New Jobs By 2022, Says Report

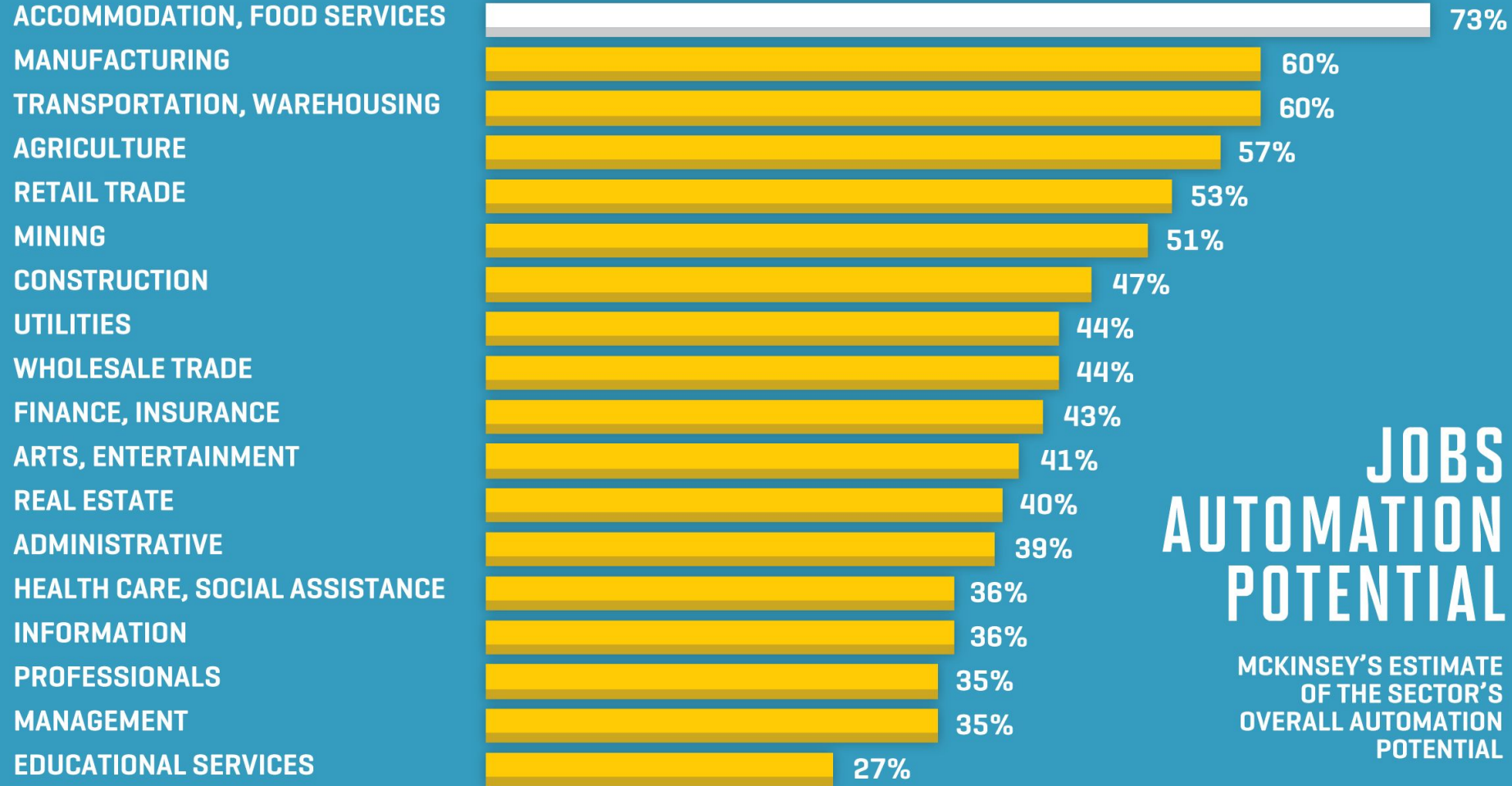


Amit Chowdhry Contributor

Consumer Tech

Tech enthusiast, born in Ann Arbor and educated at Michigan State

Machines and algorithms in the workplace are expected to create 133 million new roles, but cause 75 million jobs to be displaced by 2022 according to a new report from the World Economic Forum (WEF) called "The Future of Jobs 2018." This means that the growth of artificial intelligence could create 58 million net new jobs in the next few years.



JOBS AUTOMATION POTENTIAL

MCKINSEY'S ESTIMATE
OF THE SECTOR'S
OVERALL AUTOMATION
POTENTIAL

Routine
jobs are
at risk!

N. RAPP / FORTUNE MAGAZINE

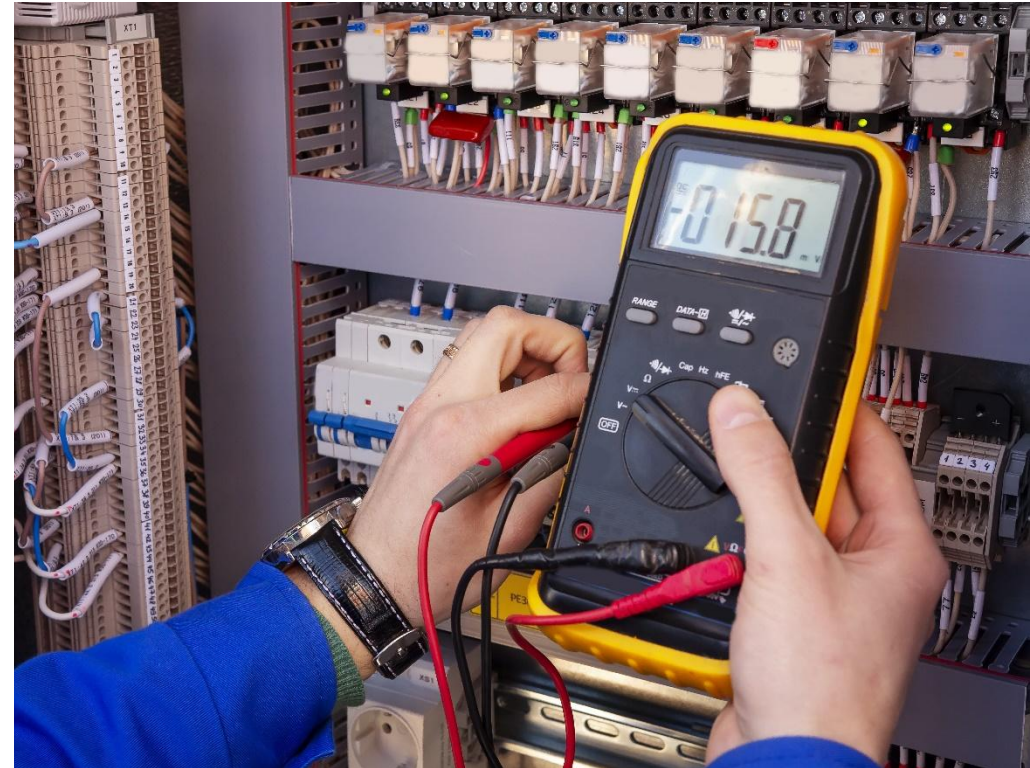
SOURCE: MCKINSEY

Image from: www.fortune.com



Why a career in instrumentation?

- In the future of work, automation creates instrumentation jobs!
- Multiple pathways (Certificate, 2-year, or 4-year degrees)
- Your skills are transferrable to different industries in different locations. If you get bored, you can move!



Why a career in instrumentation?

- You are the one who “knows” the equipment. People who used to “know” are retiring!
- You bring value to your company
 - Example – in automotive manufacturing, **1 minute of downtime costs \$22,000!** You will make up your annual salary if you get the equipment running within 3 minutes!
- Median salary is \$27.78 per hour (compared to \$19.71 for welding).



Image: www.autonews.com

Grant Program Highlights

- **C**ontrolling, **O**perating, and **M**easuring: **P**athways for **L**earners to **E**ngineering **T**echnology **E**mployment (Project COMPLETE)
- Goal to expand instrumentation workforce pathways for 500 North Louisiana high school students over 3 years
- Collaboration between Louisiana Delta Community College and Louisiana Tech University

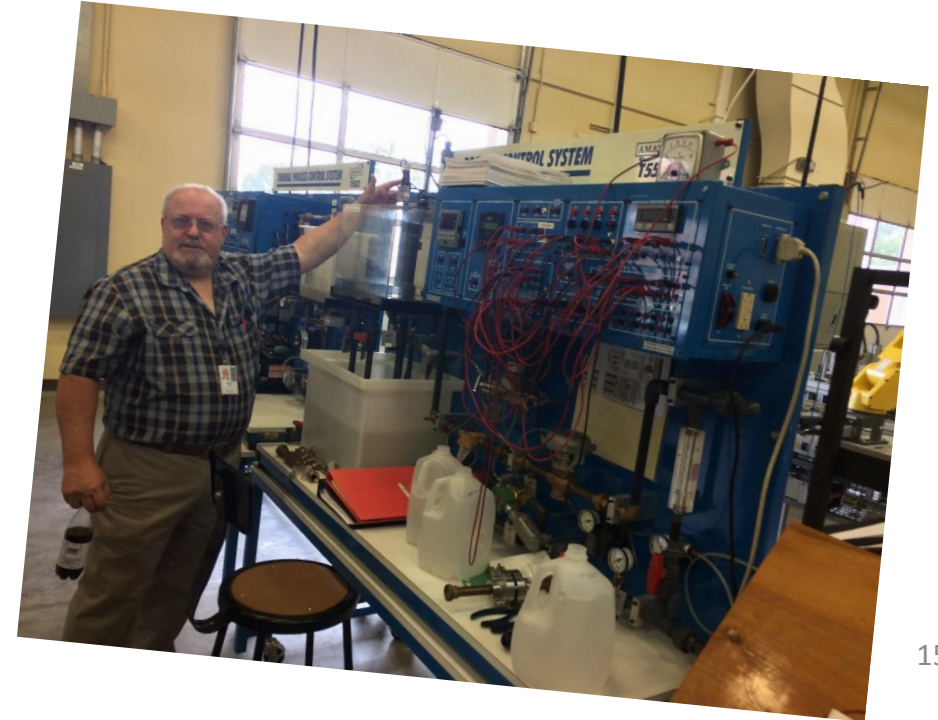
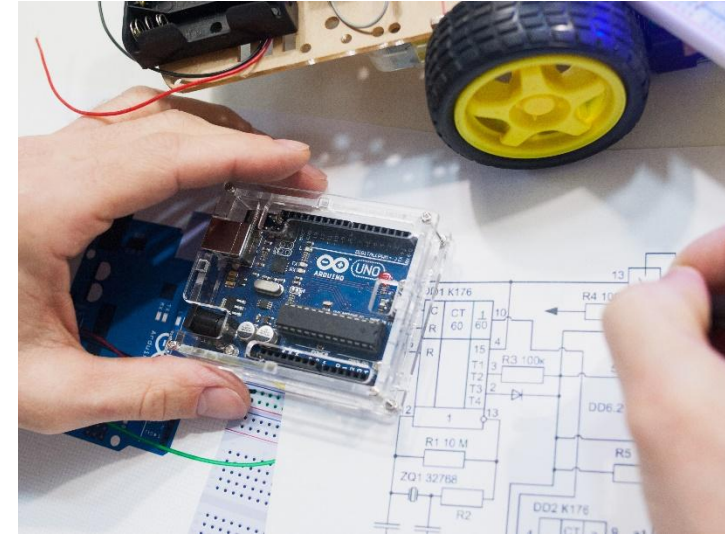


LOUISIANA DELTA
COMMUNITY COLLEGE



Grant Program Components

- Workshops twice a year for teachers/counselors
- Lesson materials
 - Math requirement Algebra I
 - Hands-on, project-based “basic electricity and instrumentation”
- Hands-on project kits
- Industry field trips and speakers (virtual?)
- Scholarships
- Full course implementation
 - Jump Start / pair with IBC?
 - Dual enrollment?
 - Pathways to LDCC and/or LA Tech University

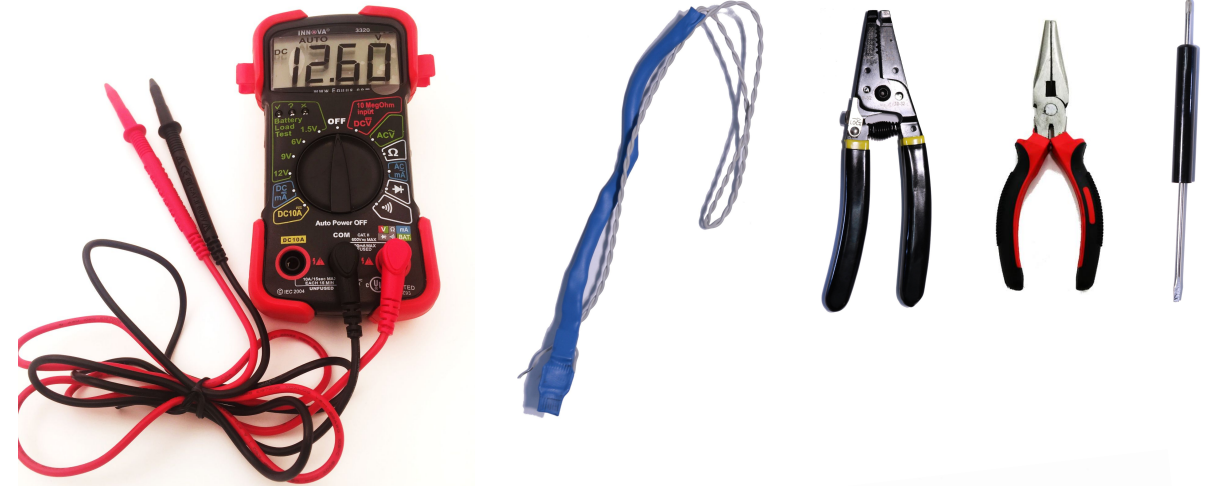
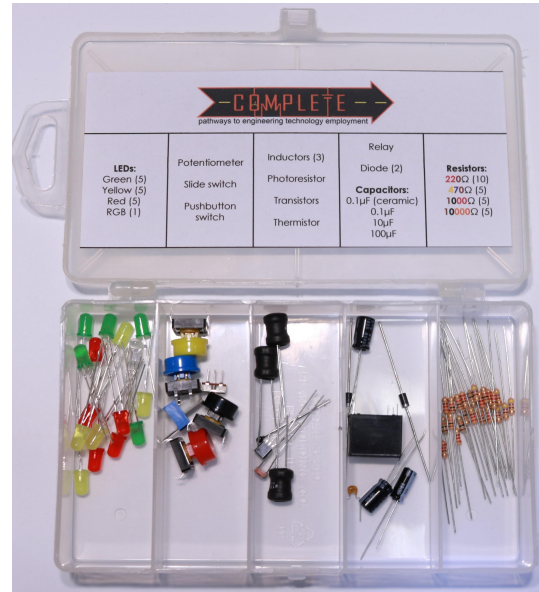
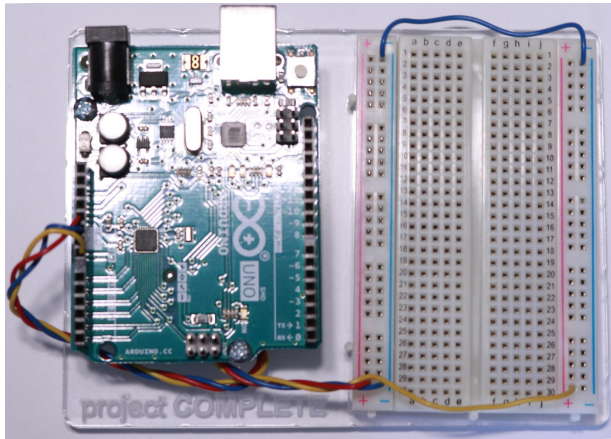


What's in Your Kit?



What's in Your Kit.

- Project COMPLETE Kits come with everything you need implement the curriculum.
- The Arduino IDE is available free online and runs on Windows PCs and Chromebooks



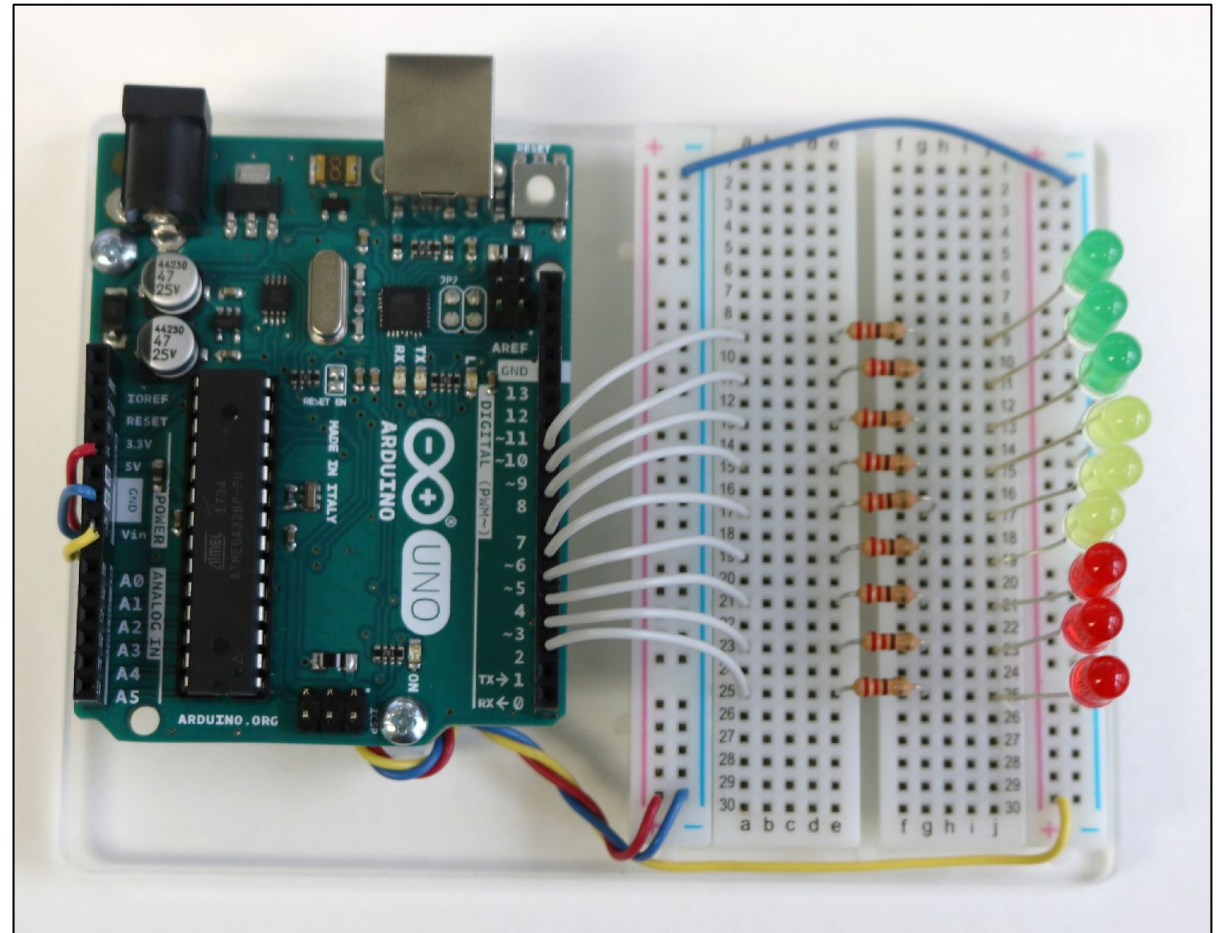
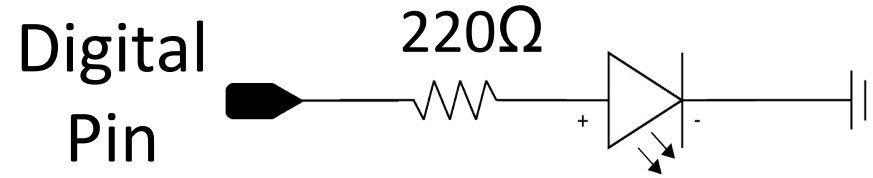
Student will work with fundamental electronic components including:

- Resistors
- Photoresistors
- LEDs
- Switches
- Transistors
- Diodes
- Capacitors
- Relays



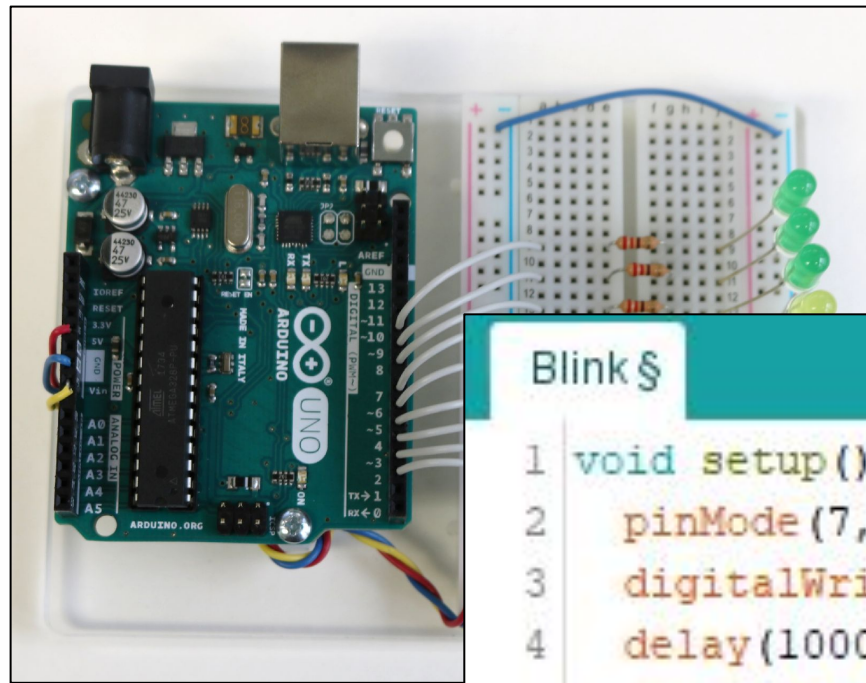
Wiring Circuits

Students learn to read schematic diagrams and wire circuits on a breadboard.



Programmable Logic

Students learn to write simple programs and are then challenged to extend what they have learned to complete more complex programming tasks.



Blink \$

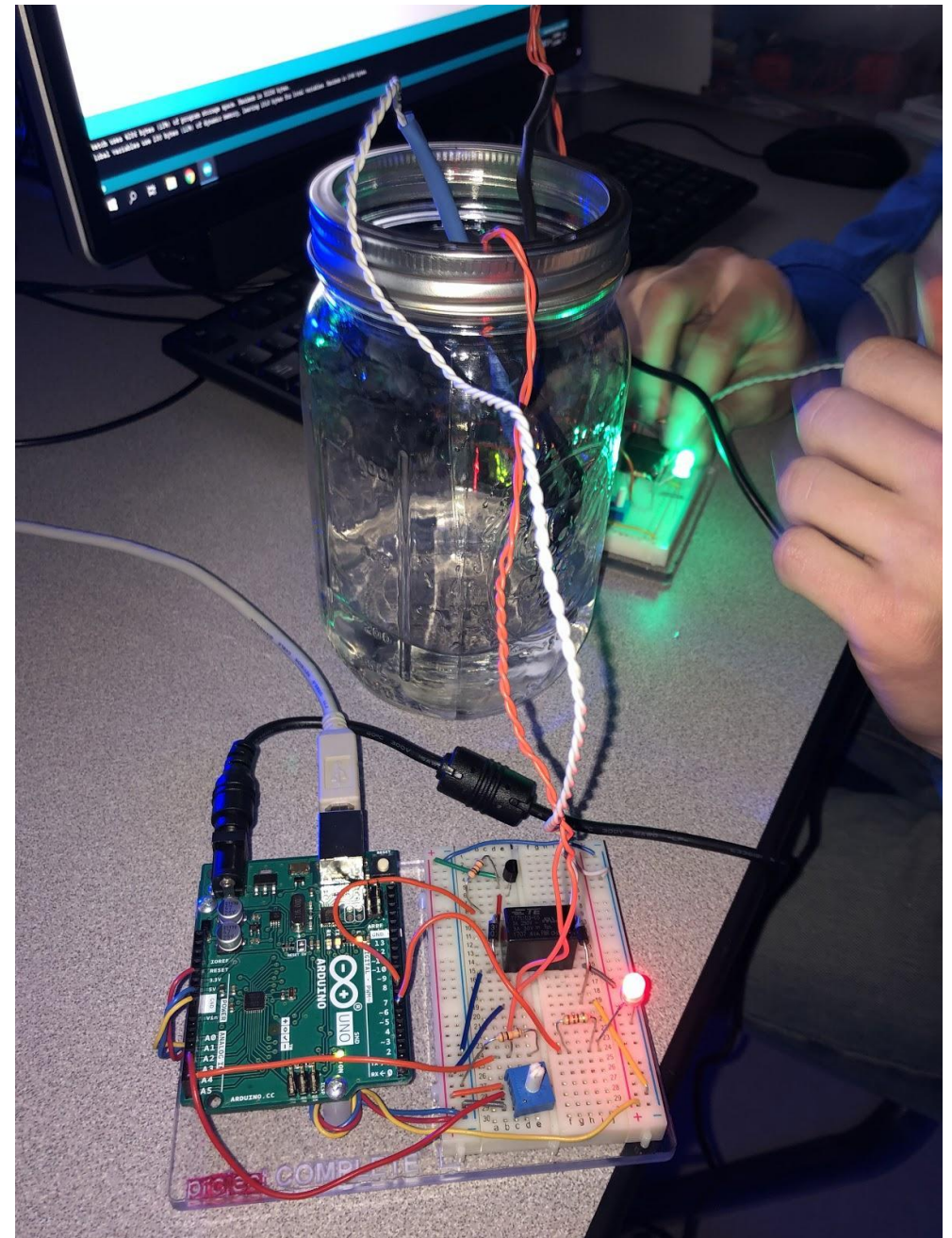
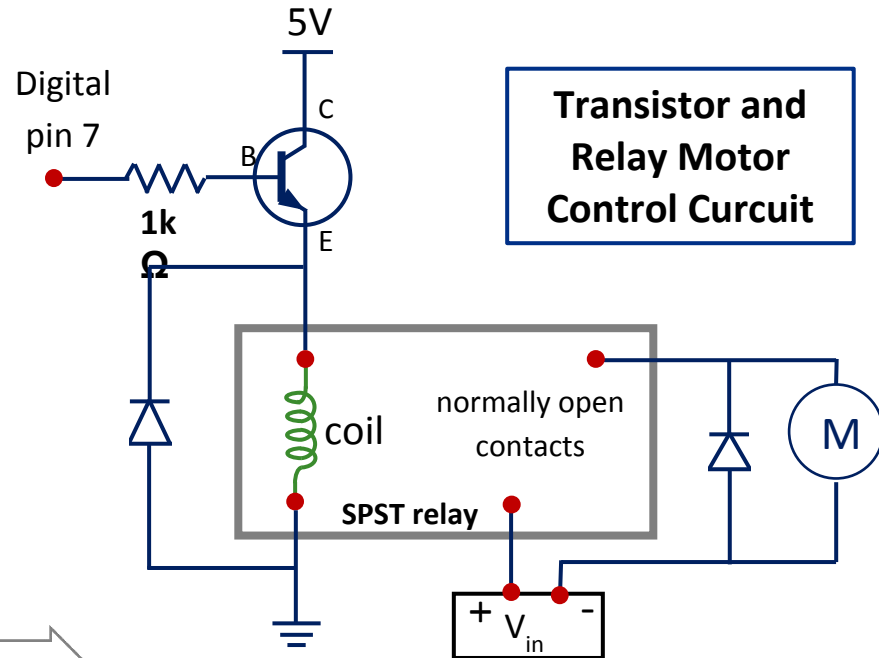
```
1 void setup() {
2   pinMode(7, OUTPUT);
3   digitalWrite(7, HIGH);
4   delay(1000);
5   digitalWrite(7, LOW);
6   delay(1000);
7 }
```

```
void loop() {
  for (int i = 2; i < 11; i++);
  digitalWrite(i, HIGH);
  delay(1000);
  digitalWrite(i, LOW);
}
```

```
loop() {
```

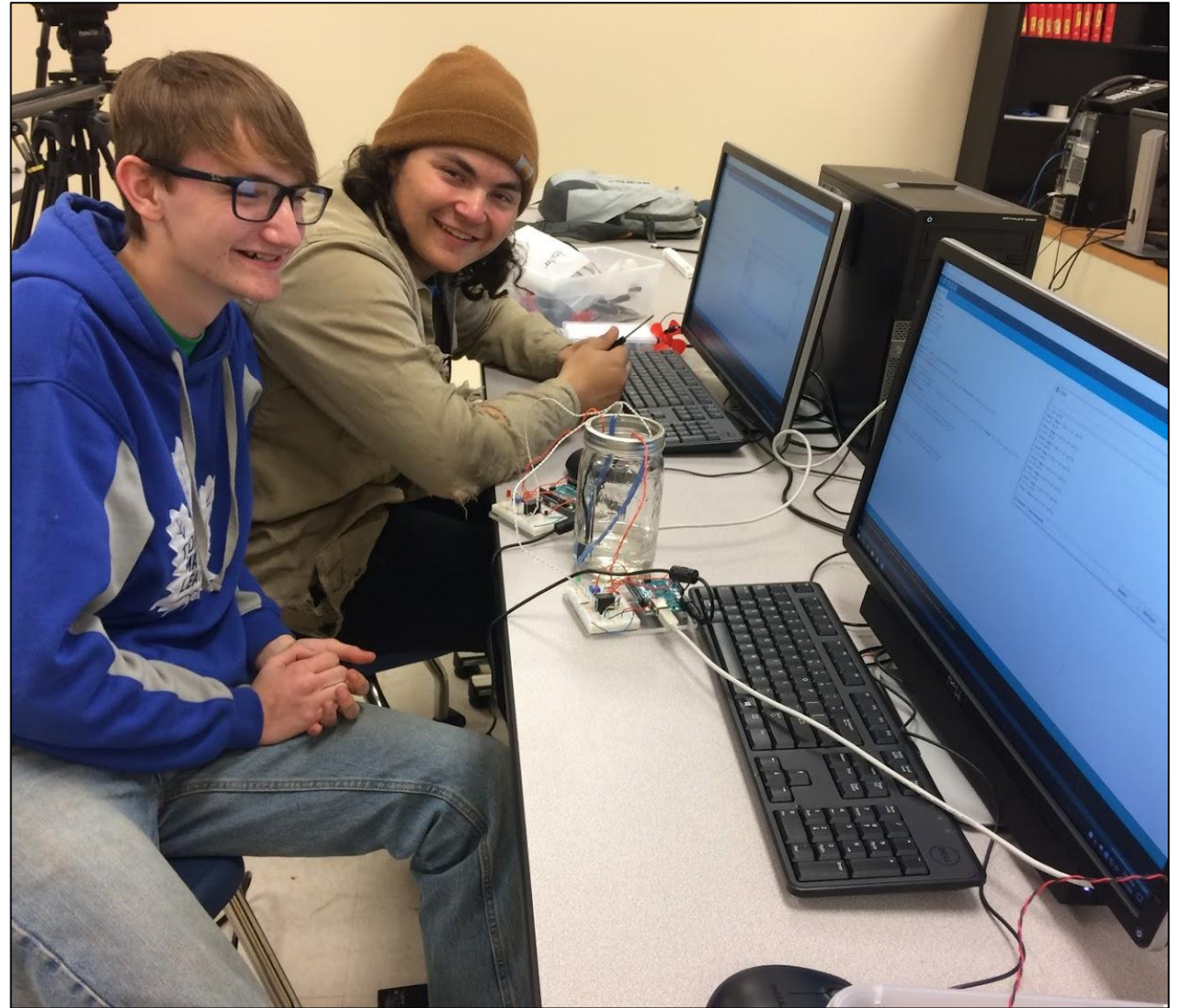
Process Control System

The course culminates with the Sous Vide project, when students build a full process control system.



Two students with working process control systems!

One is now an electrician's apprentice and the other is headed to Tech for ICET.



Implementing Project COMPLETE



Project COMPETE Instrumentation & Control Units (Dual Enrollment: LDCC INST1010 and INST1000)

**BPSTIL
Pilot**

1	2	3	4a	4b	5
Intro to Electrical Circuits <ul style="list-style-type: none"> • Intro to Electricity, Conductors & Insulators • Voltage, Current and Resistance • How to use a Multimeter • Ohm's Law • Breadboards • Power ($P = VI$) 	Basic Circuits <ul style="list-style-type: none"> • Series and Parallel Circuits • Equivalent Resistance • KVL & KCL • Solve Circuits 	Working with Arduino <ul style="list-style-type: none"> • Arduino • Control LEDs Circuit • FOR Statements • LEDs • Switches • Bridge Circuits • Photoresistors 	Programming and Data Collection <ul style="list-style-type: none"> • Analog & Digital I/O. • Intro to Excel Spreadsheets • Linear Regression • Thermistors • Programming Fundamentals 	Control System Elements / Project <ul style="list-style-type: none"> • Transistors • Relays • Cascading Switches • Potentiometers • Sous Vide Project • Capacitors & RC Circuits 	Industrial Inst. & Control Elements and Documentation <ul style="list-style-type: none"> • Industrial Instrumentation • Industry Organizations • Industry Standards • Process Variables • Control Loops • Piping & Inst. Drawings

NCCER Electrical Level 1 Modules [*Helper IBC*]

1	2	3	4	5	6	7	8	9	10	11	12
<i>Orient. To Electrical Trade</i> <ul style="list-style-type: none"> • Sectors • Apprentice /Training • Employ. Responsibility • Key Ind. Standards 	<i>Electrical Safety</i> <ul style="list-style-type: none"> • Hazards • PPE • Standards • Tool Safety 	<i>Intro to Circuits</i> <ul style="list-style-type: none"> • Charge • Conduc-tor s • Voltage... • Ohm's Law • Power • Multimeter 	<i>Electrical Theory</i> <ul style="list-style-type: none"> • Series / Parallel • Equivalent Resistance • Multimeter • KVL & KCL 	<i>Intro to the NEC</i> <ul style="list-style-type: none"> • Chapters • Definitions • Articles • Tables • Specific Reqts. 	<i>Device Boxes</i> <ul style="list-style-type: none"> • Types of boxes • Installation • Sizing 	<i>Hand Bending</i> <ul style="list-style-type: none"> • 90° Bends • Offset • Saddle • Cut, Ream, Thread 	<i>Raceways & Fittings</i> <ul style="list-style-type: none"> • Select & install • Fasteners & anchors • Wireways.. • Cable Trays 	<i>Conduct. & Cables</i> <ul style="list-style-type: none"> • Types • Sizes • Materials • Ampacities • Install conductors 	<i>Basic Electrical Drawings</i> <ul style="list-style-type: none"> • Construct. Drawings • Symbols • Material Takeoff 	<i>Resid. Electrical Services</i> <ul style="list-style-type: none"> • Sizing • Grounding • Installation • Panel Bd • Branch Ct • Devices 	<i>Electrical Test Equip.</i> <ul style="list-style-type: none"> • Voltmeter • Ohmmeter • Ammeter

*Shaded modules overlap significantly.

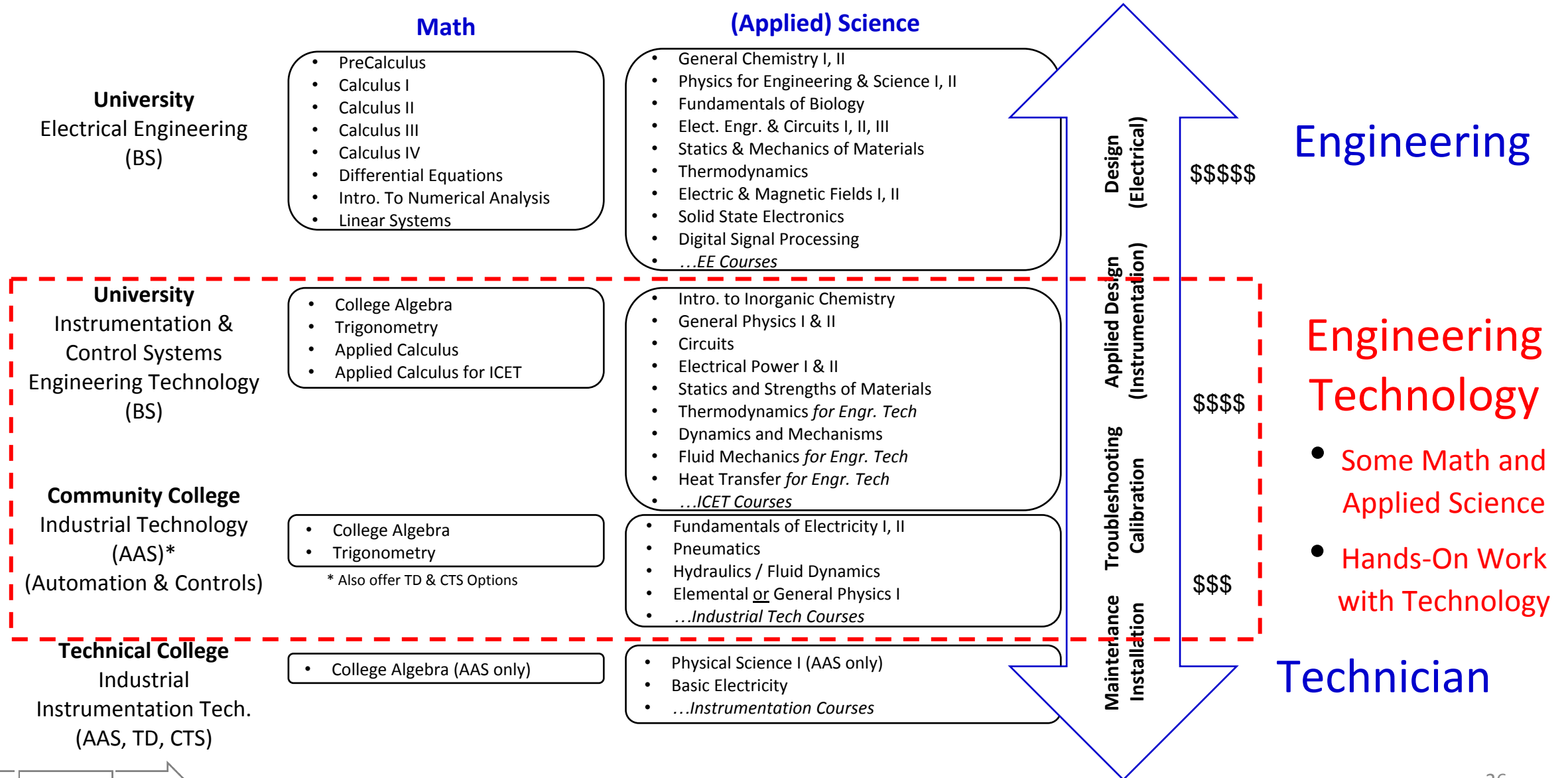


Which students are a good fit for recruiting?

- Students who have successfully completed Algebra I
- Juniors and Seniors (preferably)
- Students who will qualify for College Algebra (Math ACT ≥ 19) upon college admission
- Students in the “middle” – not interested in full trades or full engineering route
- Robotics teams, Cyber Lit classes
- Special recruiting efforts for underrepresented student populations.



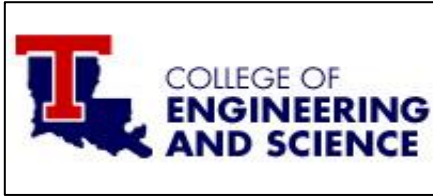
Range of Technical Career Options Targeted



Talking with Students about Pursuing a Career in Applied Science / Technology

- Engineering / Computer Science
 - Continue to take math through AP Calculus if you can; or at least MASTER Algebra 2 and Advanced Math – Trig.
 - Consider Intro. to Electrical & Instrumentation Technologies (IEIT). We use the Arduino microcontroller in this course; which is what Tech uses for the its first 3 engineering courses.
 - If you are interested in programming, take Computer Programming 1 (Amazon Future Engineers Curriculum – Python)
- Technology with Good Pay and Less Math
 - Continue to take math through Algebra 2 (and Advanced Math – Trig if you want to go the Instrumentation & Control route).
 - Electrical & Instrumentation Technologies (IEIT) will prepare you for a program like Tech’s Instrumentation and Control Systems Engineering Technology degree, or a 2 year program at LDCC, BPCC...
 - Electricians make really good money and spend more time doing hands-on work. At BPSTIL you can start with Core Maintenance paired with an Electrical 1 and/or take Electrical 2. Both will earn you Industry Based Certifications.
 - Also, take a look at the programs offered at our local Community Colleges and Technical Schools.

Local Tech School Programs Targeted



- Inst. and Control Systems Engineering Technology
- Construction Engr. Tech.
- Mechanical Engr.
- Electrical Engr.
- Industrial Engr.
- Computer Science
- Biomedical Engr.
- Civil Engr.
- Nanosystems Engr.
- Cyber Engr.
- Chemical Engr.



- Engineering (AS)
- Industrial Technology (Advanced Manufacturing and Mechatronics)
- Industrial Technology (Automation and Controls)
- Oil and Gas Production Technology
- Industrial Technology (Industrial Maintenance)
- Oil and Gas Production Technology
- Oil and Gas Technology (Process Technology)



- Industrial Instrumentation Technology
- Industrial Manufacturing Technology
- Air Conditioning and Refrigeration
- Automotive Technology
- Electrician – Commercial Wiring II
- Electrician- Industrial Electrician



- Industrial Instrumentation Technology
- Process Technology
- AC & Refrigeration Technology
- Automotive Technology
- Electrician
- Industrial Maintenance Technology

- IBEW/etA Apprenticeship Program (Local IBEW)
- Benteler Steel Apprenticeship Program (BPCC)
- ...

What does implementation of this course look like on your campus?



THINGS TO CONSIDER

- Full course vs partial course implementation
- Teacher certification
- CDF Course Code
- Industry Based Credential



Full Course v/s Partial Course

FULL COURSE IMPLEMENTATION

- Students could receive an IBC
- Will it fit into the master schedule
- Is the teacher certified to teach the course

PARTIAL COURSE IMPLEMENTATION

- Embed lessons into other courses
 - Physical Science
 - Physics
 - Career Exploration
 - Ag
 - Automotive
 - Computer Science



TEACHER CERTIFICATION

teach louisiana

LDOE Louisiana Department of EDUCATION

HOME/LOGIN ► CERTIFICATION PREPARATION JOBS

» Certification »

Use this tool to determine which courses can be taught by specific certification areas.

Search By Course

Search for:

Example : 400102 or biology

-OR-

Search By Certification Area

Search for:

Example : 884 or biology
(accepts partial matches)

Tip: Partial queries are permitted. For a complete list of courses or areas of certification, leave the search field blank & click the "Find" button.

» Certification

- Certification Home
- Add-on & Ancillary Endorsements
- Verify a Certificate or Teaching Authorization
- Status of a Certification Application
- Certification Applications & Forms
- Course Code & Area of Certification Finder
- Certification FAQs
- Contact Information

teach louisiana

LDOE Louisiana Department of EDUCATION

HOME/LOGIN ► CERTIFICATION PREPARATION JOBS

» Certification »

To view the courses a certified teacher may teach, click on the teacher's certification area listed below.

« Page 1 of 1 »

Areas of certification searched: 301

Areas of certification


301	AGRICULTURE 6-12
-----	------------------


» Certification

- Certification Home
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TEACHER CERTIFICATION





HOME/LOGIN
CERTIFICATION
PREPARATION
JOBS

» Certification »

Click on course name to view the area of certification permitted to teach the selected course.

Page 3 of 6

Course Code	Course Name	Grades	Core
010607	NCCER Carpentry in Agriscience III (1 credit)	9-12	NO
010608	NCCER Carpentry in Agriscience III (2 credit)	9-12	NO
010609	NCCER Carpentry in Agriscience III (3 credit)	9-12	NO
010610	NCCER Carpentry in Agriscience IV (1 credit)	9-12	NO
010611	NCCER Carpentry in Agriscience IV (2 credit)	9-12	NO
010612	NCCER Carpentry in Agriscience IV (3 credit)	9-12	NO
010701	NCCER ELECTRICAL IN AGRISCIENCE (1 CREDIT)	9-12	NO
010702	NCCER ELECTRICAL IN AGRISCIENCE (2 CREDITS)	9-12	NO
010703	NCCER ELECTRICAL IN AGRISCIENCE (3 CREDITS)	9-12	NO
010801	NCCER PIPEFITTING IN AGRISCIENCE (1 CREDIT)	9-12	NO
010802	NCCER PIPEFITTING IN AGRISCIENCE (2 CREDITS)	9-12	NO
010803	NCCER PIPEFITTING IN AGRISCIENCE (3 CREDITS)	9-12	NO
010804	NCCER Pipefitting in Agriscience II (1 credit)	9-12	NO
010805	NCCER Pipefitting in Agriscience II (2 credit)	9-12	NO
010806	NCCER Pipefitting in Agriscience II (3 credit)	9-12	NO
010807	NCCER Pipefitting in Agriscience III (1 credit)	9-12	NO
010808	NCCER Pipefitting in Agriscience III (2 credit)	9-12	NO
010809	NCCER Pipefitting in Agriscience III (3 credit)	9-12	NO
010810	NCCER Pipefitting in Agriscience IV (1 credit)	9-12	NO
010811	NCCER Pipefitting in Agriscience IV (2 credit)	9-12	NO

» Certification

- Certification Home
- Add-on & Ancillary Endorsements
- Verify a Certificate or Teaching Authorization
- Status of a Certification Application
- Certification Applications & Forms
- Course Code & Area of Certification Finder
- Certification FAQs
- Contact Information



COURSE SELECTION

Inbox (30) - wendi.plants@bossie x | P Workshop_7-22-20.pptx - Google x | Workshop_7-22-20.pptx - Google x | Untitled presentation - Google Slides x | Jump Start Graduation Pathways x

louisianabelieves.com/resources/library/jump-start-graduation-pathways

Apps | Email | Illuminate | Google Drive | Calendar | BPSB | eSpark Student App | BPSTIL | Zearn | Classes | Chat

JUMP START 1.0

File
2017-2018 Universal Jump Start Courses
2017-2018 Internships Course Codes PDF
2017-2018 Internships Course Codes
2017-2018 Universal Jump Start Course PDF
2017-2018 Career Readiness Courses
2017-2018 Career Readiness Courses PDF
Master Course by Pathway Spreadsheet
Graduation Pathways Review Panel PDF
Process for Developing a New Graduation Pathway PDF
Graduation Pathways Description PDF
2019-2020 List of CDF Qualifying Courses

Please send your requests for adding a new course or industry-based credential to a pathway to JumpStart@la.gov.

If you want to request a new course code, please [visit the New Course Code Portal \(will open in new tab\)](#).

STATEWIDE GRADUATION PATHWAYS

File
2017-2018 Automotive Service Pathway PDF
2017-2018 Automotive Service Pathway
2017-2018 Carpenter Pathway PDF
2017-2018 Carpenter Pathway
2017-2018 Certified Mechanical Drafter Pathway PDF
2017-2018 Certified Mechanical Drafter Pathway
2017-2018 Certified Nursing Assistant Pathway PDF
2017-2018 Certified Nursing Assistant Pathway
2017-2018 Collision Repair Pathway PDF

INTEGRATED GRADUATION PATHWAYS

File
2017-2018 Agriculture Tech Pathway PDF
2017-2018 Agriculture Tech Pathway
2017-2018 Digital Media Pathway PDF
2017-2018 Digital Media Pathway
2017-2018 Health Sciences Patient Care and Management Pathway PDF
2017-2018 Health Sciences Patient Care and Management Pathway
2017-2018 Hospitality Tourism Culinary and Retail Pathway PDF
2017-2018 Hospitality Tourism Culinary and Retail Pathway
2017-2018 Information Technology Pathway PDF

1:55 PM 7/20/2020

-COMPLETE-

2019-2020 Jump Start CDF-Qualifying Courses

Course Description	Course Code
NCCER Carpentry IV (3 Credits)	110714
NCCER Construction Technology	110110
NCCER Core	311720
NCCER Electrical I (1 Credit)	110711
NCCER Electrical I (1 Credit)	313400
NCCER Electrical I (2 Credits)	110712
NCCER Electrical I (2 Credits)	313402
NCCER Electrical I (3 Credits)	110713
NCCER Electrical I (3 Credits)	313403
NCCER Electrical II (1 Credit)	110716
NCCER Electrical II (1 Credit)	313405
NCCER Electrical II (2 Credits)	110717
NCCER Electrical II (2 Credits)	313412
NCCER Electrical II (3 Credits)	110718
NCCER Electrical II (3 Credits)	313413
NCCER Electrical III (1 Credit)	313417
NCCER Electrical III (2 Credits)	313418
NCCER Electrical III (3 Credits)	313419
NCCER Electrical in Agriscience (1 Credit)	010701
NCCER Electrical in Agriscience (2 Credits)	010702
NCCER Electrical IN AGRISCIENCE (3 Credits)	010703
NCCER Electrical in Agriscience II (1CR)	010704
NCCER Electrical in Agriscience II (2CR)	010705
NCCER Electrical in Agriscience II (3CR)	010706
NCCER Electrical in Agriscience III (1CR)	010707
NCCER Electrical in Agriscience III (2CR)	010708
NCCER Electrical in Agriscience III (3CR)	010709



Q & A

(and quick group photo!)



Thank you for joining us today!

To get your stipend, make sure you:

- “Sign in” in the chat box
- Submit your forms (informed consent, W9, photo release, survey) - check your email!

Stipends will be processed during the month of September for videos and workshop participation.



References

- “Key Industries.” Louisiana Economic Development.
<https://www.opportunitylouisiana.com/key-industries>.
- Advanced Technology Services, Inc. “Downtime Costs Auto Industry \$22k/Minute – Survey.”
Thomas, 2006.
<https://news.thomasnet.com/companystory/downtime-costs-auto-industry-22k-minute-survey-481017>.
- “Occupational Employment Statistics.” Electro-Mechanical Technicians and Welding, Soldering, and Brazing Workers. Bureau of Labor Statistics, 2018.
https://www.bls.gov/oes/current/oes_nat.htm.

