



**2014 – 2015 Utah Cluster Acceleration Partnership Grant
Year End Report, July 31, 2015**

Name of Educational Institution: Bridgerland Applied Technology College
(BATC)

Primary Contact Person: John Davidson
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Logan, Utah 84321
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Summary:

Bridgerland Applied Technology College requested funds to purchase equipment and supplies to expand the Automated Manufacturing and Robotics Program in Logan and Brigham City by adding SCARA robots and Vision Systems certifications as well as duplicate the entire program at the Brigham City campus.

Applicant Type: Educational Institution

Targeted Industries: Manufacturing, Production, Robotics, Composites

Project Title: Automated Manufacturing and Robotics BATC Brigham City Campus

Key Partners and Secondary Educational Institutions:

Bridgerland Applied Technology College, Utah State University Brigham City Regional Campus, Box Elder School District, Autoliv, ATK, Autonomous Solutions Inc, Fanuc Robotics, Motoman Robotics

Counties to be Served: Box Elder County and Cache County

Projected Outcomes:

Develop Automated Manufacturing and Robotics training program in Brigham City. Expand industry certification training classes in SCARA robots and vision systems. Double the number of students trained by BATC in Automated Manufacturing and Robotics.

Amount of Funding Received: \$100,000

\$100,000.00 was funded by UCAP to help get these programs expanded to the Brigham City Campus and expand the Logan program. Grant funding and matching dollars were all in line with the grant request. Equipment was all purchased and installed and is being used in training courses.

Nine New classes are being offered in Logan and Brigham City as well as the full time and high school Automated Manufacturing and Robotics program is now available in Brigham City.

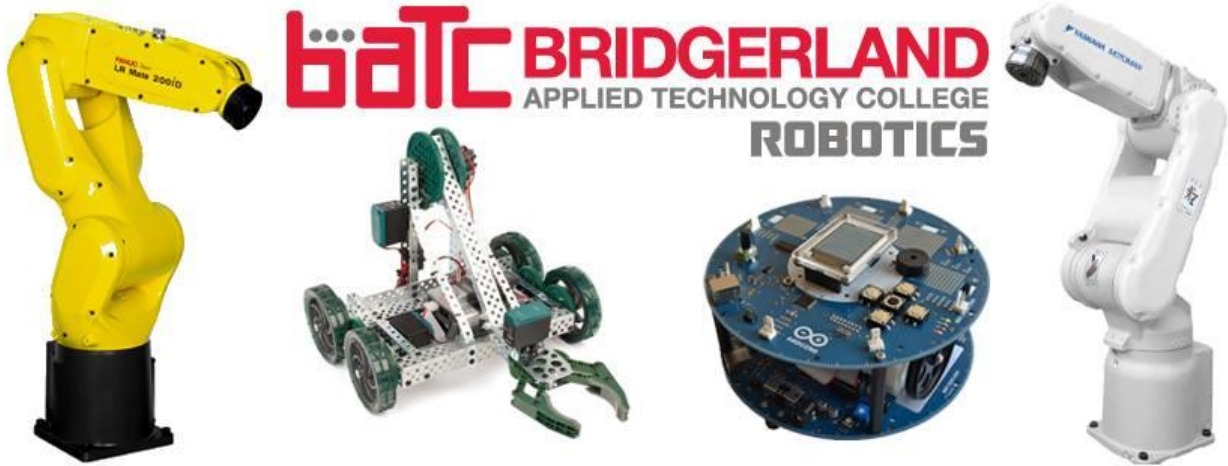
Yamaha Scara Robots

Yamaha Scara Basic Programming Class: This course covers the skills an operator, technician, engineer or programmer needs to set up and program a YAMAHA SCARA Robotics Handling Tool Software Package. Students will be practicing hands-on pendant labs with industrial grade YAMAHA SCARA robots. Competencies: • Power up and Jog the Robot • Recover from common program and robot faults • Execute production operations • Create, modify and execute a material handling program • Create and execute MACROs • Monitor, Force, and Simulate Input and Output Signals • Backup and restore individual programs and files.



4 Yamaha robots were purchased and training classes are being offered in Brigham City

Yamaha Scara Advanced Programming Class: Advanced programming is the next step after the basic programming class. Topics from the previous classes will be used in this class to develop a more complex scenario. Students will be given a hypothetical example workcell. Then they will be given the task of creating all the necessary programs to deal with multifaceted issues using advanced programming techniques. Competencies: • Understand YAMAHA manipulation related to programming issues • Understand advanced program control structures • Develop programs with a language independent model • Perform coding of programs using advanced programming techniques • Set up Multi-tasking operations • Create Condition Monitors • Program advanced I/O instructions • Learn how to wire external Inputs/Outputs and sensors



Cognex Vision Camera Trainers



Cognex Vision Systems - In-Sight Easy Building and Spreadsheets

Cognex In-Sight Easy Builder Programming The In-Sight EasyBuilder Standard class gives new In-Sight users an overview of the hardware and software used by In-Sight Vision Systems. With the focus on getting the most from the In-Sight Explorer EasyBuilder interface, users learn how to walk through the process of setting up a vision application, step by step in EasyBuilder. This interface requires no programming and uses intuitive menus enabling them to focus on solving their application quickly and effectively. Day three of this class focusses on lighting, filters, and lenses and is the same as the first day of the Spreadsheet class. Cognex In-Sight Spreadsheet Programming The In-Sight EasyBuilder Spreadsheet class gives new In-Sight users an overview of the hardware and software used by In-Sight Vision Systems. With the focus on getting the most from the In-Sight Spreadsheet interface, users learn how to walk through the process of setting up a vision application, step by step in Spreadsheets. This interface unlocks the real power of the In-Sight system. Day one of this class focusses on lighting, filters, and lenses and is the same as day three of the In-Sight Easy Builder class.

Brigham City Student numbers are as follows for 2014-2015 reporting

July 1, was the official start date of the Automated Manufacturing and Robotics program in Brigham City. As of July 31, 2015 there are 34 High school Students and 7 Full time students enrolled in the Brigham City Automated Manufacturing and Robotics program.

The following workshops and classes were offered in Brigham City with the following numbers

- Yamaha Scara robot cert class Fall 2014 we had 8 completers @30 hours
- First Robotics had 8 students in Fall 2014 @42 hours and 7 in Winter 2015@ 42 hours
- High School summer program June-July 2015 – 9 Students at @132 hours each and 20 @32 hours each.



Workshops and Industry Certification Students:

Logan West Campus workshops held with numbers:

VEX robotics: Fall 4, Winter 8, Spring 9

30 hour Cert courses (these include our program students who took cert classes):

HMI Human Machine Interface: 4

Variable Frequency Drives: 4

Industrial Networking: 4

Cognex Vision Systems: 7

Motoman Programming: 12

Fanuc Programming: 66

Robot Maintenance: 9

There were 70 Full-time Automated Manufacturing and Robotics Students during the 14-15 Fiscal year at BATC.

Full time students were placed at the following companies in Automated Manufacturing and Robotics related jobs throughout the year.

AutoLiv

Presto Products

Nucor

Butterfly Express

Schriebers

Malto Meal

Great Salt Lake Salt Co

Quilt-EZ

Campbell Scientific

Icon Health and Fitness

Gossners

ASI



Student Success

Tracy Allen is the BATC Student of the Month for August 2015



Here are the comments from Tracy's instructors

“Tracy Allen, is a very determined, bright, and outgoing student. She is currently doing an internship with Nucor Steel in Plymouth, UT.”

“When Tracy first arrived at BATC, she was a single mom who was struggling to make ends meet. She has made the most of her moment here by working hard and appreciating her opportunity to learn. She has a winning attitude that inspires others to succeed. Tracy is also appreciative of those people who have helped her, and she realizes that no one “makes it” on her own. She is presently an intern at Nucor, where she most likely will end up working permanently. She will make a very good living for herself and her son. Congratulations Tracy, we are proud of you!”

New Classes

The following are the new classes offered in Logan and Brigham City because of grant funds.

- ***AUTOMATED MANUFACTURING & ROBOTICS AND ELECTRONICS (OPEN LAB)***
Modular lab created to help those in industry who desire self-paced coursework and hands-on training in Composites, Robotics, PLCs, Fluid Power, Motor Controls, Industrial Drives and Alignment, Mechanical Maintenance, Green Energy, Electronic Fundamentals, Communications Circuits, Practical Troubleshooting, Instrumentation, Digital Circuits, Programmable Logic Devices, Microcontrollers, etc.
- ***AUTOMATIC CONTROLS TROUBLESHOOTING (OPEN LAB)***
Enhance industrial automatic controls troubleshooting skills with practice on simulation software. No textbook required. Automatic Controls Troubleshooting 1-4 must be taken sequentially. Logan West Campus IAMT2101 01 LC Automatic Controls Troubleshooting 1 Troubleshooting Electrical Circuits, Control Circuits and Motor Circuits.
- ***FIRST ROBOTICS COMPETITION OPEN LAB FOR HIGH SCHOOL STUDENTS***
Combines the excitement of sport with the rigors of science and technology. Teams are challenged to build and program robots to perform prescribed tasks against a field of competitors. It's as close to "real-world engineering" as a student can get. Volunteer professional mentors lend their time and talents to guide each team. During this process they will learn key STEM principles and robotics concepts.
- ***MOTOMAN BASIC PROGRAMMING CERTIFICATION***
This course is an introduction to programming with material handling on the MOTOMAN FS100 controller. The course pertains to programming of press tending, case packing, machine tending, and palletizing cells. Students will be practicing hands-on labs with industrial grade MOTOMAN MHJ Manipulators and MOTOMAN System FS100 Controllers.
- ***VISION SYSTEMS BASIC COGNEX CERTIFICATION***
This course covers Cognex In-Sight Easy Builder and Spreadsheets programming. The In-Sight EasyBuilder Standard gives users hands-on training with hardware and software used by In-Sight Vision Systems. First 2 days users learn how to walk through the process of setting up a vision application, step by step in EasyBuilder. This interface requires no programming and uses intuitive menus enabling them to focus on solving their application quickly and effectively. Day three focuses on lighting, filters, and lenses. The final 2 days users learn how the In-Sight Spreadsheet interface unlocks the real power of the In-Sight system.
- ***PROGRAMMING CERTIFICATION***
This is an introduction to the principles of industrial robotics, related systems, and applications. Learn basic sensing and locomotion principles as you build and control a robotic arm that will be used for selected activities from manual robot control to computer program mode.
- ***VEX ROBOTICS COMPETITION PREPARATION OPEN LAB FOR HIGH SCHOOL STUDENTS***
Students will walk through the design and will build a mobile robot to play a sport-like game. During this process they will learn key STEM principles and robotics concepts. At the culmination of this class, they will compete head-to-head against their peers in the classroom, or on the world stage in the VEX Robotics Competition. This

modular and project-based curriculum teaches the design process in an engaging, hands-on manner. High school students only.

- **INDUSTRIAL NETWORKING** *Learn to network PLCs, remote I/O blocks, sensor systems, and robots so they communicate with each other. Learn networking protocols and systems most commonly used in industry and manufacturing. Learn to hookup, program and use various networking communication equipment. Learn industrial networking software.*
- **YAMAHA SCARA BASIC PROGRAMMING CERTIFICATION** *This course covers the skills an operator, technician, engineer or programmer needs to set up and program a YAMAHA SCARA Robotics Handling Tool Software Package. Students will be practicing hands-on pendant labs with industrial grade YAMAHA SCARA robots*

Vex Robotics High School Competition:

The grant helped fund the BATC High school VEX robotics team. The team won the State of Utah Tournament and went on to win the National Vex Robotics Tournament. The students were able to go to the capitol building for the UCAP kick off meeting and demonstrate their skills.

They were also able to be on several news channels, KSL and Good 4

Utah. www.ksl.com/?nid=1194&sid=34441546&title=cache-valley-robotics-team-wins-national-championship

http://www.good4utah.com/gtu/story/d/story/national-and-world-champion-robotics-teams/13964/pyTIF_NTH0aTmxcJ8hNmhw





In cooperation with a local company, Autonomous Solutions a 2nd annual Robot Boot Camp was offered for high school students as well as a robotics fair at BATC.



YOUR FUTURE IN ROBOTICS BEGINS AT BATC

What will you
get out of Robotics
Boot Camp?

How about an opportunity to work on industrial robots that are used in our area... AND you'll build a robot that can dance, blow bubbles, golf... AND you'll create a part using carbon fiber... AND you'll learn how to work with **AND KEEP (\$75 value)** one of the most versatile microcontrollers on the market... AND you'll get to learn about the brain that runs manufacturing facilities called a PLC... and much much more!

<https://www.regonline.com/roboticsbootcamp>

How do you register for BATC Boot Camp?

Go to the URL above or
Call or come in and talk to
Student Services at :

435-753-6780

What is the cost to attend?

\$105.00

What do I get to take home?

You will get to take home
all of your completed
projects including your
Arduino Kit, a composite
part, some cool BATC
swag, and an experience
that you will never forget!



QUESTIONS?

batc.edu • mfuller@batc.edu • (435) 750-3275

NEW

Industrial Robotics



moloman.com
fanucrobotics.com

BATC's Industrial Robotics program is second to none in the Western United States! It offers nationally recognized industry certifications as well as excellent placement opportunities. High school students also have the ability to earn up to 30 credit hours at Utah State. Our Industrial Robotics classes are very hands on and use actual industrial robots, pendants, and programming language.

NEW

VEX Competition Robotics



vexrobotics.com

The VEX Robotics Design System offers students an exciting platform for learning about areas rich with career opportunities spanning science, technology, engineering, and math (STEM). The VEX Robotics project encourages teamwork, leadership and problem solving among groups. VEX is like basketball robotics on steroids. High school students compete on a local, state, and national level.

NEW

Arduino Electronics Prototyping



arduino.cc

Arduino is a tool for making computers and robots that can sense and control more of the physical world than your standard desktop computer. It's an open-source physical computing platform based on a simple microcontroller board and an open environment for writing software for the board. Students learn that possibilities are virtually endless and only limited by their imagination.

NEW

Advanced Composites

Carbon fiber, fiber glass, and Kevlar are considered advanced composites and are used in things like robot housings, skateboards, aviation, bicycles, race cars, etc. The high strength to weight ratio achieved by today's advanced composites make them one of the hottest and most versatile materials in use today.

NEW

Robix Classroom Robotics



robix.com

Robix classroom robots allow students to create over 15 different configurations and projects using construction parts, servos, gripper assemblies, electronics, and PC programming. Students will experience real-world R&D and true problem solving while building each project.

High School Competitions: During the last year BATC hosted two of the VEX robotics competitions, One in Brigham City and One in Logan, with over 350 in attendance and 18 teams competing.

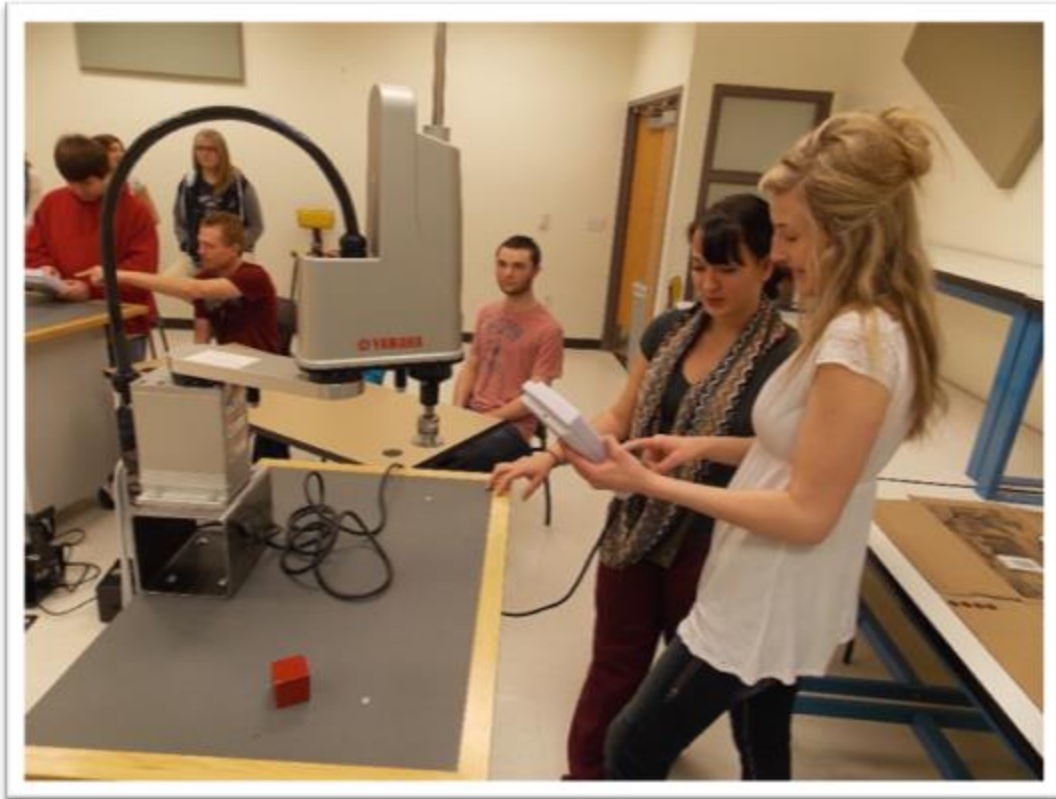




Career Days at BATC exposed over 3500 junior high students to the field of Automated Manufacturing and Robotics



Robotics Training Lab at BATC West Campus in Logan



New Robotics Training Lab in Brigham City



2 New Instructors

1 full time instructor was hired for Brigham City and a second was hired for the Logan Campus and have been trained and become certified as an industry trainers for Cognix Vision Systems and Yamaha Scara Robots.

Industry Recognition: BATC has become known as the “Go To” place in Northern Utah for robotics training. Companies are excited and sending employees to BATC for automated manufacturing and robotics training. Partnerships have been created with Utah State University and engineering graduate students are coming down and taking the courses to give them a “Hands On” experience with composites and robotics.

Key Partners and Educational Institutions: Bridgerland Applied Technology College, Utah State University, Box Elder School District, Cache School District, Logan School District, Autoliv, ATK, Autonomous Solutions Inc, Fanuc Robotics, Motoman Robotics, SAE, Pepperidge Farms and ICON Health and Fitness.

BATC is a Motoman Certified Merit Training Center. There are currently only three certified centers in the country; the closest being in Ohio. As a certified MERIT training center the ratio of students to robots is 2 to 1, with 4 Motoman robots, this allows BATC to train 8 students at a time. BATC is also a Fanuc Certified training facility with 4 Fanuc Robots with similar requirements for training.

Starting July 1, 2015 BATC has eight certificates approved within Automated Manufacturing and Robotics for current students in Logan West Campus and four of these are available for completion also at our Brigham City Campus. New enrolling students will qualify to earn these new certificates. Any classes taken in Brigham City Campus are transferable to Logan toward the other advanced certificates offered in Logan that are not currently available in Brigham and some of the advanced courses will be made available through UEN broadcast. Attached are Automated Manufacturing Certificates Outline of the eight certificates, a Certificates Progression Outline of courses for Logan and a Certificates Progression Outline of courses for Brigham City Campus.

| | |
|---|--|
| IAMA - Industrial Automation Maintenance Advanced | 1500 hrs See Breakdown |
|---|--|

| | |
|--|--|
| IAMB - Industrial Automation Maintenance Basic | 1200 hrs See Breakdown |
|--|--|

| | |
|--------------------------------|---------------------------------------|
| IAMG - Green Energy Technician | 300 hrs See Breakdown |
|--------------------------------|---------------------------------------|

AMRO - Automated Manufacturing Operator

600 hrs [See Breakdown](#)

AMRA - Automated Manufacturing Advanced Operator

900 hrs [See Breakdown](#)

AMRC - Controls Engineering Technician

1230 hrs [See Breakdown](#)

AMRS - Robotics STEM Academy

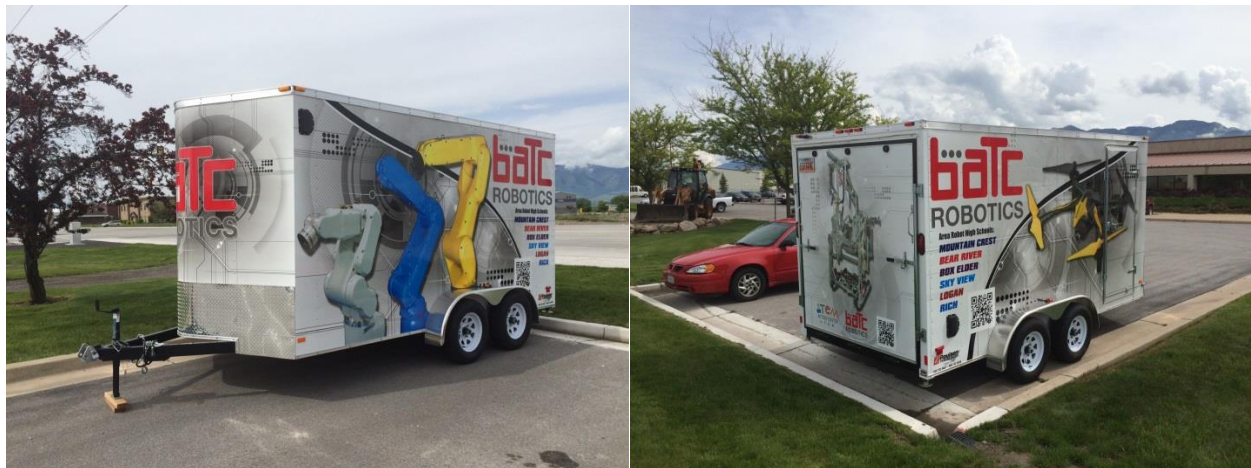
900 hrs [See Breakdown](#)

Pathways to Advanced Degrees

There are career pathways established for students to move on to the next level with all of the 900 hour or better certificates allowing students to move on to USU and receive 30 credits towards and AAS in General Technology. Beyond that, agreements are being worked on to allow students to move into BS programs at USU in Engineering or Technology or UVU in Engineering Robotics Technology (ERT) or Manufacturing Management at UVU which is an online degree. These are all high paying in demand career paths for these students.

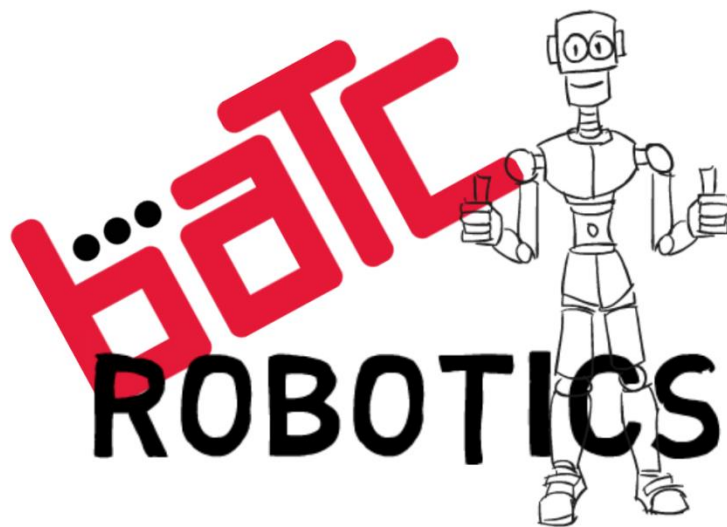
Promotional Trailer

A trailer to haul robots between schools and to VEX competitions has been purchased to promote robotics training and BATC.





Robots and PLC Trainers





Automated Manufacturing and PLC Computer Lab



Automated Manufacturing and Robotics
Certificates Progression Outline
FY 2015-2016

| CERTIFICATES | Months @ 30 hours/week | HOURS |
|--|-------------------------------|-------------------|
| Green Energy Technician | 3 months | 300 hours |
| Automated Manufacturing Operator Certificate | 5 months | 600 hours |
| Automated Manufacturing Advanced Operator | 8 months | 900 hours |
| BATC Robotics STEM Academy Certificate *Expected 2 years completions for High School Students | 8 months | 900 hours |
| Automated Manufacturing Basic Technician | 10 months | 1200 hours |
| Automated Manufacturing Advanced Certificate | 13 months | 1500 hours |
| Industrial Robotics Advanced Certificate | 13 months | 1500 hours |
| Controls Engineering Technician Certificate *Hours shown here include the advanced operator certificate. | 18 months | 2130 hours |
| Controls Engineering Technician Certificate *Hours for returning students who have completed advanced operator certificate or demonstrate equivalent experience and pass a competency test at advanced operator level. | 10 months | 1230 hours |

Automated Manufacturing and Robotics Department
Certificate Progression Outline of Courses for BCC

| Core Courses | | Course Hours | | | | |
|--|--|--------------|-------------------------------|--|--|---|
| ELEC 1001 | Computer Tools for Technology | 60 | 600 hour Operator Certificate | 900 hour Advanced Operator Certificate | 1200 hour Basic Technician Certificate | 1500 hour Automated Manufacturing Advanced Certificate (requires 1200 hour Basic Technician Certificate plus 300 hours electives) |
| IAMT 1011 | Basic Electrical Theory and Wiring | 60 | | | | |
| IAMT 1103 | Basic Workplace Safety | 15 | | | | |
| IAMT 1104 | Industrial Safety | 15 | | | | |
| IAMT 1151 | 3D Modeling | 60 | | | | |
| IAMT 1200 | Automated Manufacturing Basics | 60 | | | | |
| IAMT 1250 | Fluid Power Hydraulics | 60 | | | | |
| IAMT 1252 | Fluid Power Pneumatics | 60 | | | | |
| IAMT 1300 | Industrial Mechanics | 90 | | | | |
| IAMT 1500 | Electrical Motors/Drives | 90 | | | | |
| IAMT 1511 | P&ID and Electrical Print Reading | 30 | | | | |
| IAMT 1102 | Technical Communication Fundamentals | 30 | | | | |
| IAMT 1600 | Electrical Motor Controls | 120 | | | | |
| IAMT 2000 | Programmable Logic Controllers 1 | 90 | | | | |
| IAMT 2020 | Introduction to Industrial Robotics | 60 | | | | |
| IAMT 1021 | Troubleshooting Electrical Circuits | 15 | | | | |
| IAMT 1611 | Troubleshooting Control Circuits | 15 | | | | |
| IAMT 1621 | Troubleshooting Motor Circuits | 15 | | | | |
| IAMT 2002 | Troubleshooting PLC Circuits | 15 | | | | |
| IAMT 2012 | Sensors and Instrumentation | 120 | | | | |
| IAMT 2024 | Robot and Automation Simulation Software | 30 | | | | |
| WELD 1050 | Welding Overview | 90 | | | | |
| Elective Courses (ONLY 300 HOURS REQUIRED) | | Course Hours | | | | |
| IAMT 2026 | Yamaha SCARA Basic Programming Certification | 60 | | | | |
| IAMT 2033 | Motoman Basic Programming Certification (30 hrs) | | | | | |
| ELEC 1002 | Computer Tools for Technology 2 | 30 | | | | |
| ELEC 1003 | Electronics Assembly & Soldering | 30 | | | | |
| ELEC 1021 | Electronics Fundamentals DC | 90 | | | | |
| ELEC 1022 | Electronics Fundamentals AC | 90 | | | | |
| ELEC 1111 | Semiconductor Devices | 120 | | | | |
| ELEC 1130 | Digital Fundamentals | 120 | | | | |
| ELEC 1141 | VEX Competition Robotics A | 30 | | | | |
| ELEC 1142 | VEX Competition Robotics B | 30 | | | | |
| ELEC 1200 | Practical Electronics/Electrical Troubleshooting | 120 | | | | |
| ELEC 2041 | Communication Circuits | 60 | | | | |
| ELEC 2051 | Microcontrollers 1 | 60 | | | | |
| ELEC 2052 | Microcontrollers 2 | 60 | | | | |

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|-----------|---|--------|--|
| ELEC 2062 | Mobile Robotics Platforms | 60 | |
| ELEC 2064 | Aerial Robotics Platforms | 60 | |
| ELEC 2066 | Basic Drone Technology and Piloting | 30 | |
| ELEC 2080 | Programmable Logic Devices | 120 | |
| IAMT 2331 | Industry Related Certifications/Seminars | 15-60 | |
| IAMT 2811 | Automation Final Project (Upon Instructor Approval) | 30-120 | |
| ELEC 2821 | Electronics/Electrical OJT/Instructor Aid (Upon Approval) | 30-120 | |
| IAMT 2821 | Automation Technician OJT/Instructor Aid (Upon Approval) | 30-120 | |
| IAMT 2901 | Special Applications (Upon Instructor Approval) | 30-180 | |
| IAMT 2902 | Special Applications 2 (Upon Instructor Approval) | 30-180 | |
| IAMT 2999 | Industrial Automation Maintenance Internship | 30-120 | |

Learn more about BATC Automated Manufacturing and Robotics

<http://batc.edu/programs/automated-manufacturing>

[Automation Certification Training Class Schedule/Calendar.](#)

<https://www.facebook.com/batcrobotics>

<http://batc.edu/stem>

[STEM Flyer \(One-page\)](#)

[STEM Flyer \(Double-sided, folded\)](#)

QUICK FACTS:

LOCATION(S)

West Campus (Logan)
Brigham City

ESTIMATED TUITION & FEES:

\$3,665 for the 1,500 hour specialization. Cost varies by specialization.

DURATION:

13 months (30 hrs/wk)

ESTIMATED MONTHLY PAYMENT:

\$305

PELL GRANT ELIGIBLE:

Yes

ESTIMATED BOOKS AND SUPPLIES:

\$2,445 - \$4,445 - Cost varies by specialization and/or electives chosen. This estimate is for certificates over 900 hours. Click [here](#) for books and supplies details (ISBN/edition).

AVAILABILITY:

High School Students: Morning, afternoon, and evening courses available

Adult Students: Morning, afternoon, and evening courses available
Flexible hours M - Th: 8am to 8pm
and Fri: 8am to 2:30pm

SPECIAL REQUIREMENTS:

Assessment: Basic reading, basic math, and measurements. Call (435) 750-3188 to schedule an appointment. Need a review? Get a sneak peek at the Assessment Center or enroll directly into the Academic Learning Center by calling (435) 753-6780.

Please note: A composite ACT score of 17 or a composite SAT score of 1210 can waive assessment requirements if taken no more than four years prior to enrollment.

OUTCOME DATA:

Reported Annually to the Accrediting Agency Council on Occupational Education

Completion: 93%

Job Placement: 92%

Withdrawal: 3%
