# Industry 4.0

Second NSF Grant - **Engineering Technology Program Adjustments to Address Industry Identified Industry 4.0 Technologies Related Skills Need for Manufacturing Technicians**
(Award #2148138)

# Five goals based on the first Caucus Grant

- Goal 1
  - Adjust Florida Department of Education Benchmarks and/or Standards to include Standards and Benchmarks that address Florida's technicians' Industry 4.0 skills gap as identified by Florida manufacturers.
- Goal 2
  - Provide Professional Development activities to up-skill Engineering Technology Degree faculty related to manufacturer identified Industry 4.0 technician skills need.
- Goal 3
  - Create a college faculty authored short-term College Credit Certificate to quickly up-skill current and future technicians to apply these new skills in the manufacturing workspace now.
- Goal 4
  - Engage manufacturers with college A.S.ET skills and certificates.
- Goal 5
  - Create Post-A.S. Curriculum Advanced Technology Certificate (ATC) that complements ET Degree's role in the Florida Plan for manufacturing education.
- Goal 6
  - Meet National Science Foundation funded project reporting expectations.

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# Work on Goal 2,3, and 5 - Sam Ajlani, Ron Eaglin, Jay Paterson-Susan Fendsen, Marilyn Barger (facilitating and consulting)

- Sam Ajlani, Ron Eaglin, Jay Paterson/Susan Frandsen, Marilyn Barger (facilitating and consulting)
- Developed and disseminated a data management survey to all colleges with related ET programs based on the first Caucus grant
- Presented the survey results at the last ET forum online
- From the results, currently developed a new certificate based on the current Automation CCC.
- Present this today

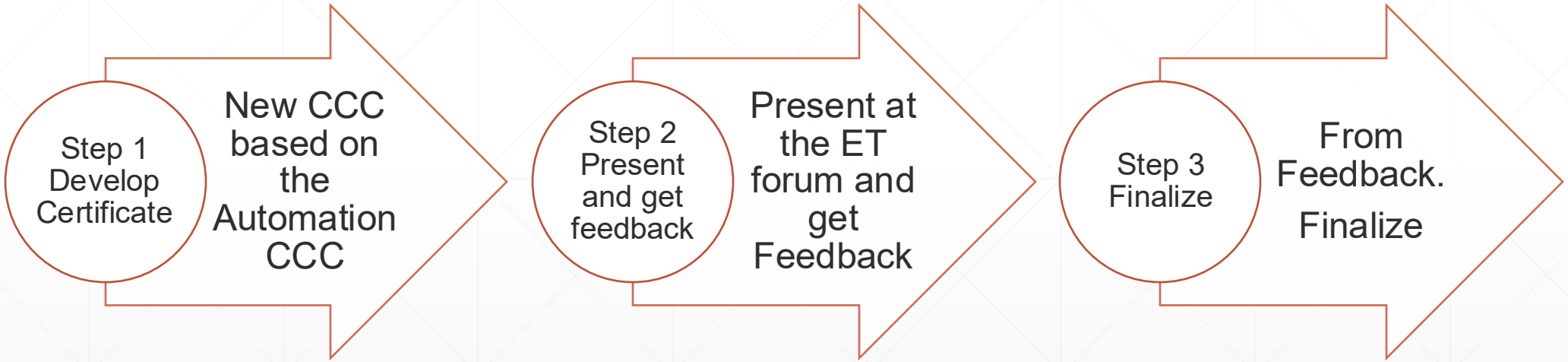
# Assumptions

- The ET AS programs are limited to 60 credit hours
- As far as Cyber Security the ET AS programs can only introduce the concepts, needs, and methods
- The ET AS students will only be able to connect and integrate to the edge computer
- IT will take from the edge computer to the cloud
- BSET will take the next steps for cyber security and OT working along side IT with the edge computer

# Outcomes

- Students will collect data and store in a csv or spreadsheet (flat file collection)
- Students will determine the accuracy of the data (i.e., where it comes from and its importance)
- Students will analyze data using spreadsheets (i.e., basic calculations)
- Students will communicate/report the data/results (i.e., charts, graphs, and tables)
- Students will determine the integrity of results (i.e., do the numbers make sense, errors)

# New Certificate



Standards:

After successfully completing this program, the student will be able to perform the following:

01.0 Understand, operate and maintain industrial automation systems.
02.0 Troubleshoot industrial automation systems.
03.0 Apply the principles of robotics to automated systems.
04.0 Create and operate human machine interfaces to control automated systems.

# Automation CCC (12 Credits)

EET 1084 or Equivalent

ETI Motors and Controls

ETS 1542 Introduction to PLCs

ETS 1540 Industrial Applications using PLCs

(or something equivalent to these courses)

Proposed Standards:

After successfully completing this program, the student will be able to perform the following:

01.0 Understand, operate and maintain industrial automation systems.
02.0 Troubleshoot industrial automation systems.
03.0 Apply the principles of robotics to automated systems.
04.0 Create and operate human machine interfaces to control automated systems.
05.0 Establish data acquisition and communication.

# New CCC (24 Credits)

EET X084 Intro/survey of Electronics

ETI X843 Motors & Controls

ETS X542 Intro to PLC

ETS X540 Industrial Applications using PLCs & Robots

ETS X535 Automated Process Control

ETS X680 Mechatronics I3

PROVIDES THE STUDENT WITH AN INTRODUCTION TO MECHATRONICS AND MEASUREMENT SYSTEMS. TOPICS INCLUDE MICROCONTROLLER PROGRAMMING AND INTERFACING, DATA ACQUISITION, AND MECHATRONICS CONTROL ARCHITECTURES. LABORATORY EXERCISES WILL CONSIST OF EXPERIMENTS WITH MICROCONTROLLERS, SENSORS, ACTUATORS, AND DATA ACQUISITION HARDWARE.

ETS XXXX New course

COMMUNICATION WITH MICROSOFT EXCEL WILL BE USED FOR DATA ACQUISITION. MANUFACTURING CONCEPTS SUCH AS BATCH PROCESSING, SUPERVISORY CONTROL, JUST-IN-TIME INVENTORY CONTROL, AND COMPUTER HIERARCHIES WILL BE DISCUSSED WITH LAB SIMULATION. ESTABLISHING DATA LOGGING FILES, LINKING THE VARIOUS PROCESS INPUT TO THE GRAPHIC OBJECTS CREATED, AND LINKING THE PROCESS INPUTS AND OUTPUTS FOR DISPLAY AND DATA LOGGING.

ETS X531 Industrial Human Machine Interface (L)

THIS COURSE TEACHES THE KNOWLEDGE AND SKILLS NEEDED TO CONFIGURE A COMPUTER DISPLAY FOR THE GRAPHICS OF A PROCESS AND ITS CONTROL SYSTEM, USING A HUMAN MACHINE INTERFACE (HMI) SOFTWARE PACKAGE. TOPICS INCLUDE DESIGNING PROCESS GRAPHICS, DESIGNING ALARM INDICATORS, SETTING UP TRENDING GRAPHS, ESTABLISHING DATA LOGGING FILES, LINKING THE VARIOUS PROCESS INPUT TO THE GRAPHIC OBJECTS CREATED, AND LINKING THE PROCESS INPUTS AND OUTPUTS FOR DISPLAY AND DATA LOGGING. HUMAN MACHINE INTERFACE DESIGN PROTOCOLS. **ETS X535 is Prerequisite**

Questions about the new CCC?

## Propose a name?

What changes would you recommend?