



# **Certifications for Industry 4.0**



SACA Membership

# INDUSTRY 4.0

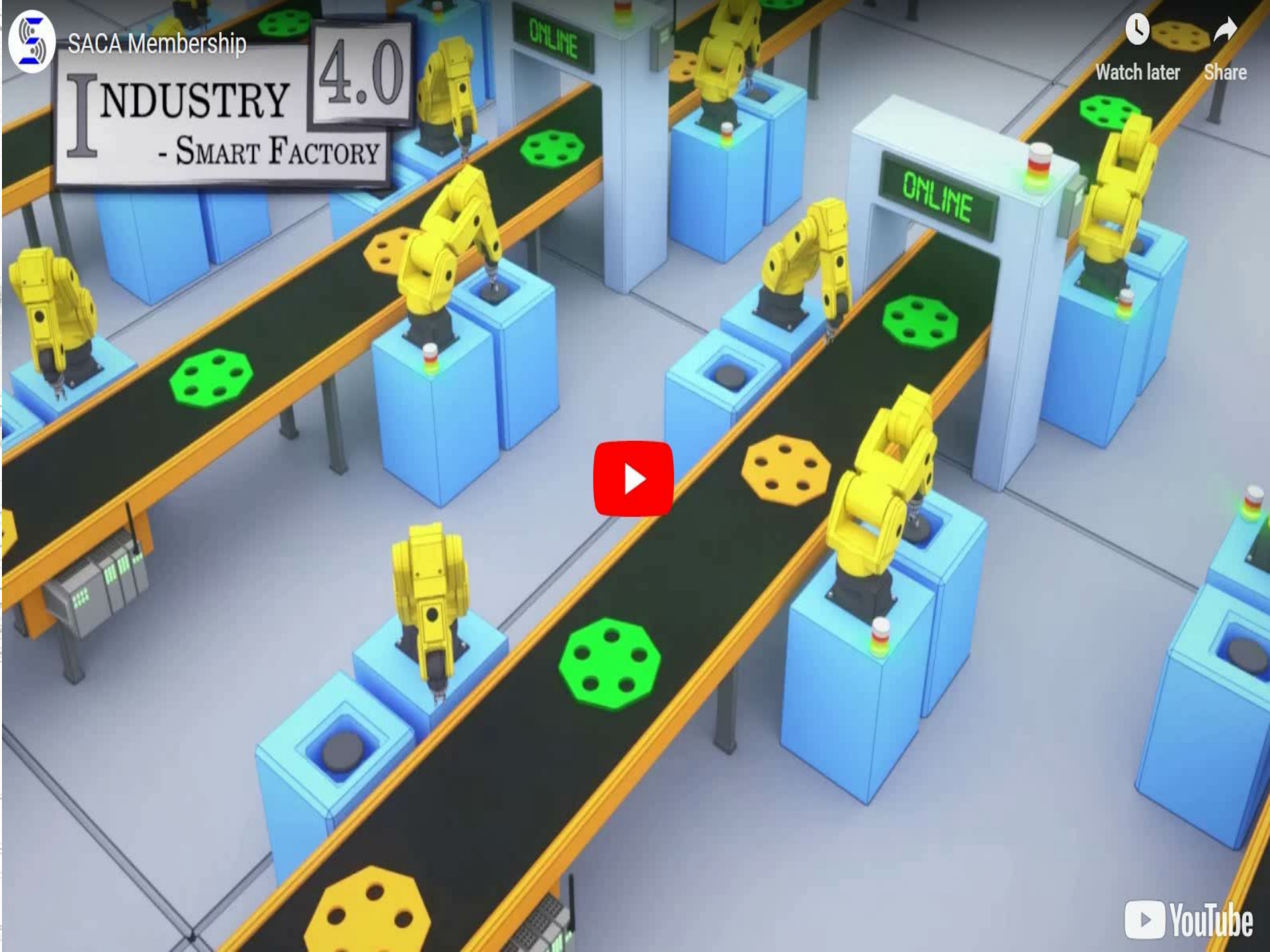
- SMART FACTORY



Watch later



Share



# Benefits of Industry 4.0

- Less Downtime
- Better Quality
- Faster Information
- Better Decisions



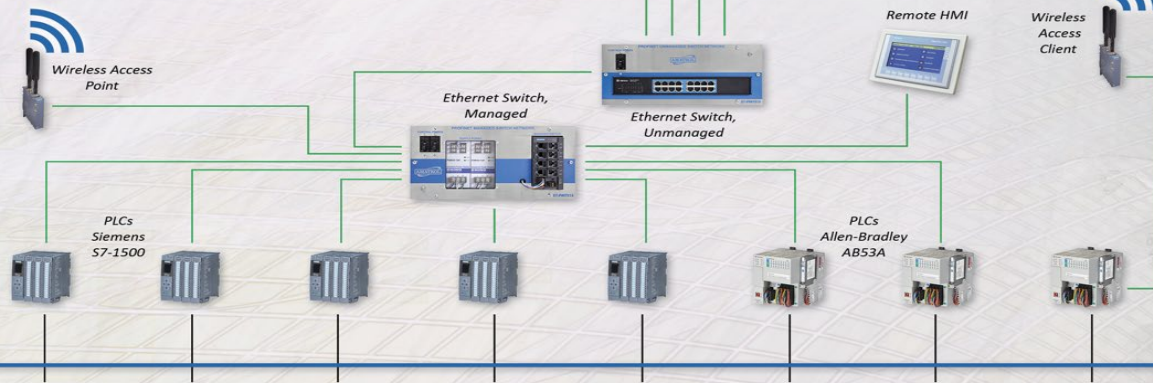
# The Connected Enterprise Tools

SAMPLE SMART FACTORY CONFIGURATION

## ENTERPRISE LEVEL



## CONTROL/AUTOMATION LEVEL



## SENSOR LEVEL



# Smart Automation Certification Alliance (SACA)

- **Non-Profit Foundation**
- **Industry Supported**
- **Mission:** *Develop occupational skills standards, promote careers, train teachers, and certify individuals in the many functions of Smart Automation (Industry 4.0 and Connected Enterprise) technologies.*

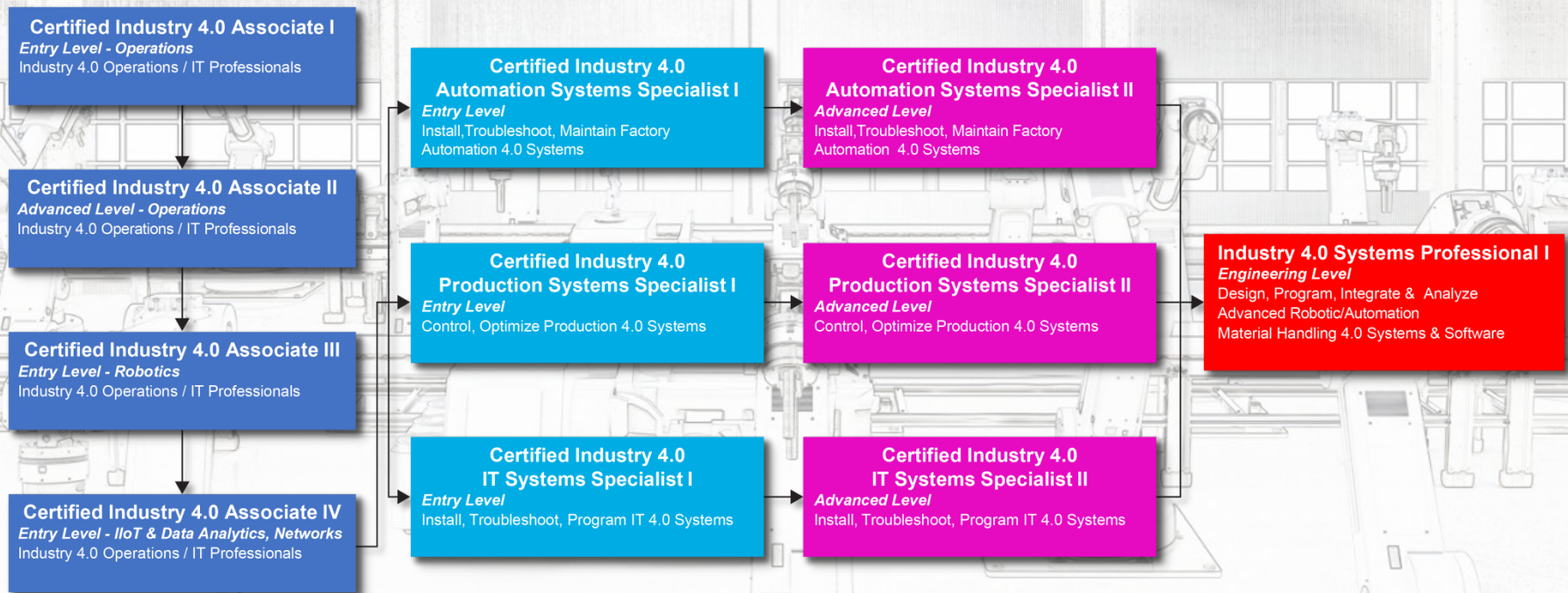
## **Companies Providing Industry Support**

- **Allergan**
- **ALS Capris**
- **Amatrol**
- **Ariens Company**
- **Ashley Furniture**
- **Boeing**
- **Boston Scientific**
- **Carpenter Technology**
- **Cheniere**
- **CSM Ingenieria**
- **Dos Pinos**
- **East Penn Mfg. Co.**
- **Fanuc America**
- **Foxconn**
- **General Microcircuits**
- **Grupo Reysa**
- **Hologic**
- **Kohler**
- **Misco Products**
- **M-Tech Control**
- **Neon Nieto**
- **Nypro Inc.**
- **Omnitech Automation, Inc.**
- **Panduit**
- **Rockwell Automation**
- **Sargento foods, Inc.**
- **Schlumberger**
- **Schneider**
- **Smith & Nephew**
- **The Hershey Company**
- **Vitec P. S.**

# **Educational Institution Support**

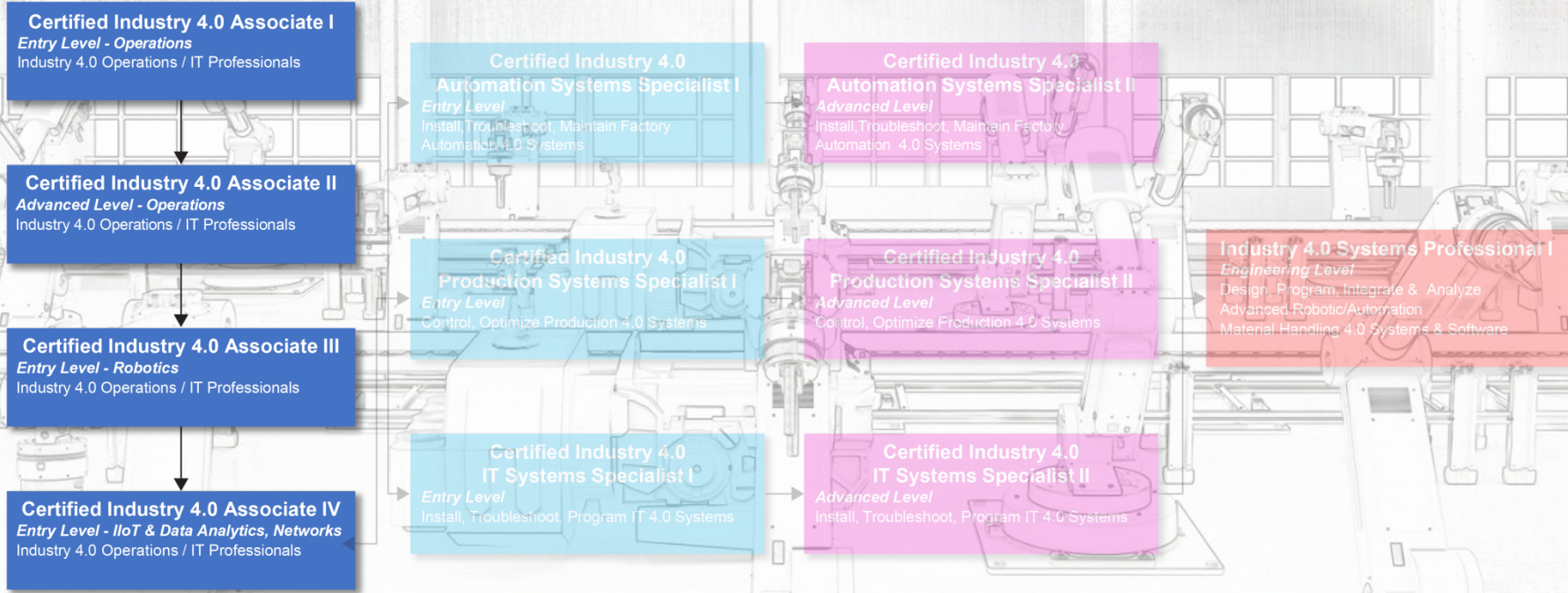
- **University of Wisconsin – Stout**
- **Gateway Technical College, WI**
- **Ivy Tech Community College**
- **Milwaukee Area Technical College**
- **Chippewa Valley Technical College**
- **Western Technical College**
- **WI Indianhead Technical College**
- **Reading Area Community College**
- **Shoreline Community College**
- **North Seattle College**
- **Houston Community College**
- **Mount Wachusett Community College**
- **University of Costa Rica**

# Industry 4.0 Systems Occupational Certifications





# Industry 4.0 Systems Occupational Certifications



# Industry 4.0 C-100 Associate- Basic Operations

- **Outcome :** Entry Level Operations
- **Competencies:**
  - Concepts and terminology of Smart Manufacturing
  - Basic setup, adjustment and operation of automated machines
  - Safety and Hand Tools
  - Blueprint and Schematic Reading
  - Precision Measurement
  - Basic electrical control, pneumatic, and sensor systems operation
  - Basic robot operation and terminology
  - Production Monitoring via HMI, Internet, Ethernet, Smart Phones

# Industry 4.0 C-102 Associate-Advanced Operations

- **Outcome:** Advanced Level Operations
- **Competencies:**
  - Smart Manufacturing system metrics and optimization
  - Setup, adjustment and operation of computer-controlled machines
  - Basic Ethernet network operation
  - Basic programmable controller programming and operation
  - Basic mechanical and hydraulics system operation/adjustment
  - Basic mechatronic systems programming and operation
  - Basic robotics and CNC programming/ operation
  - HMI interface and operation

# Industry 4.0 C-103 Associate- Robot Systems

- **Outcome :** Entry Level Robotic Systems Operations
- **Competencies:**
  - Concepts and terminology of robots
  - Robot setup, adjustment
  - Robot operation and basic programming
  - Fixtures/End of Arm Tooling types and selection
  - Robot-Ethernet network communications
  - Robot I/O device and PLC system interfacing
  - Robot monitoring and cycle time optimization
  - Robot smart manufacturing concepts

# Industry 4.0 C-104 Associate- IIoT and Data Analytics

- **Outcome :** Data Analytics and Networking
- **Competencies:**
  - Concepts of Industrial Internet of Things (IIoT)
  - PLC Ethernet Messaging Communications
  - Barcode and RFID programming and operation
  - Smart Sensor programming and operation
  - Managed Ethernet Switch configuration and operation
  - Variable frequency drive programming
  - SQL Database Systems
  - Data Analytics and Manufacturing Execution Systems (MES)
  - Lean Manufacturing and System Optimization

# Industry 4.0 Systems Occupational Certifications

**Certified Industry 4.0 Associate I**  
*Entry Level - Operations*  
Industry 4.0 Operations / IT Professionals

**Certified Industry 4.0 Associate II**  
*Advanced Level - Operations*  
Industry 4.0 Operations / IT Professionals

**Certified Industry 4.0 Associate III**  
*Entry Level - Robotics*  
Industry 4.0 Operations / IT Professionals

**Certified Industry 4.0 Associate IV**  
*Entry Level - IIoT & Data Analytics, Networks*  
Industry 4.0 Operations / IT Professionals

**Certified Industry 4.0  
Automation Systems Specialist I**  
*Entry Level*  
Install, Troubleshoot, Maintain Factory  
Automation 4.0 Systems

**Certified Industry 4.0  
Production Systems Specialist I**  
*Entry Level*  
Control, Optimize Production 4.0 Systems

**Certified Industry 4.0  
IT Systems Specialist I**  
*Entry Level*  
Install, Troubleshoot, Program IT 4.0 Systems

**Certified Industry 4.0  
Automation Systems Specialist II**  
*Advanced Level*  
Install, Troubleshoot, Maintain Factory  
Automation 4.0 Systems

**Certified Industry 4.0  
Production Systems Specialist II**  
*Advanced Level*  
Control, Optimize Production 4.0 Systems

**Certified Industry 4.0  
IT Systems Specialist II**  
*Advanced Level*  
Install, Troubleshoot, Program IT 4.0 Systems

**Industry 4.0 Systems Professional I**  
*Engineering Level*  
Design, Program, Integrate & Analyze  
Advanced Robotic/Automation  
Material Handling 4.0 Systems & Software

# Certified Industry 4.0 Automation Systems Specialist I

- **Core Micro-Credentials (partial list)**

- Electrical Systems 1
- Electric Motor Control Systems 1
- Pneumatics Systems 1
- Programmable Controller Systems 1
- Smart Factory Systems 1

- **Elective Micro-Credentials (partial list)**

- Hydraulics Systems 1
- Process Control Systems 1

# Certified Industry 4.0 Production Systems Specialist I

- **Core Micro-Credentials (partial list)**
  - Robotic Systems 2
  - Lean Manufacturing 1
  - Quality Systems 1
  - CNC Machining 1
  - Manufacturing Execution Systems 1
- **Elective Micro-Credentials (partial list)**
  - Plastics Engineering
  - Manual Machining 1
  - Additive Manufacturing 1



# Certified Industry 4.0 IT Operations Systems Specialist I

- **Core Micro-Credentials (partial list)**
  - Robotic Systems 2
  - Programmable Controller Systems 1
  - Smart Factory Systems 1
  - Data Analytics 1
- **Elective Micro-Credentials (partial list)**
  - Any of Automation Specialist 1 or Production Specialist 1 Credentials

# Industry 4.0 Systems Occupational Certifications

## Certified Industry 4.0 Associate I

*Entry Level - Operations*

Industry 4.0 Operations / IT Professionals

## Certified Industry 4.0 Associate II

*Advanced Level - Operations*

Industry 4.0 Operations / IT Professionals

## Certified Industry 4.0 Associate III

*Entry Level - Robotics*

Industry 4.0 Operations / IT Professionals

## Certified Industry 4.0 Associate IV

*Entry Level - IIoT & Data Analytics, Networks*

Industry 4.0 Operations / IT Professionals

## Certified Industry 4.0 Automation Systems Specialist I

*Entry Level*

Install, Troubleshoot, Maintain Factory  
Automation 4.0 Systems

## Certified Industry 4.0 Automation Systems Specialist II

*Advanced Level*

Install, Troubleshoot, Maintain Factory  
Automation 4.0 Systems

## Certified Industry 4.0 Production Systems Specialist I

*Entry Level*

Control, Optimize Production 4.0 Systems

## Certified Industry 4.0 Production Systems Specialist II

*Advanced Level*

Control, Optimize Production 4.0 Systems

## Certified Industry 4.0 IT Systems Specialist I

*Entry Level*

Install, Troubleshoot, Program IT 4.0 Systems

## Certified Industry 4.0 IT Systems Specialist II

*Advanced Level*

Install, Troubleshoot, Program IT 4.0 Systems

## Industry 4.0 Systems Professional I

*Engineering Level*

Design, Program, Integrate & Analyze  
Advanced Robotic/Automation  
Material Handling 4.0 Systems & Software

# Certified Industry 4.0 Professional

- **Credentials:** Core and Elective
- **Topics:** Design and analysis of Smart Manufacturing Systems
  - Manufacturing Execution Systems
  - Advanced Robotic Systems
  - Advanced Material Handling Systems Analysis: AGVs
  - Artificial Intelligence and Machine Learning
- **Prerequisites:** Elements of Specialist and Associate levels

# Certification Features

- **Industry Approved Standards**
  - Using an ISO 17024 compliant process
  - Major industrial companies
- **Hands-On Test and Computer-Based Test**
  - Pass computer-based online exam 50-75 questions
  - Pass hands-on practical test performed on approved equipment
- **Teacher Training and Certification**
  - SACA will offer teacher preparation and certification training.
  - At least one teacher must be certified at each member school.
- **Certification Costs**
  - Free to students of education members
  - Annual membership: high school campus rate \$500, college campus rate \$2500,
  - Industry per location rate \$3500

# Complimentary to Other Certifications

**Certified Industry 4.0 Associate I**  
*Entry Level - Operations*  
Industry 4.0 Operations / IT Professionals

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*Advanced Level - Operations*  
Industry 4.0 Operations / IT Professionals

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**Certified Industry 4.0 Associate IV**  
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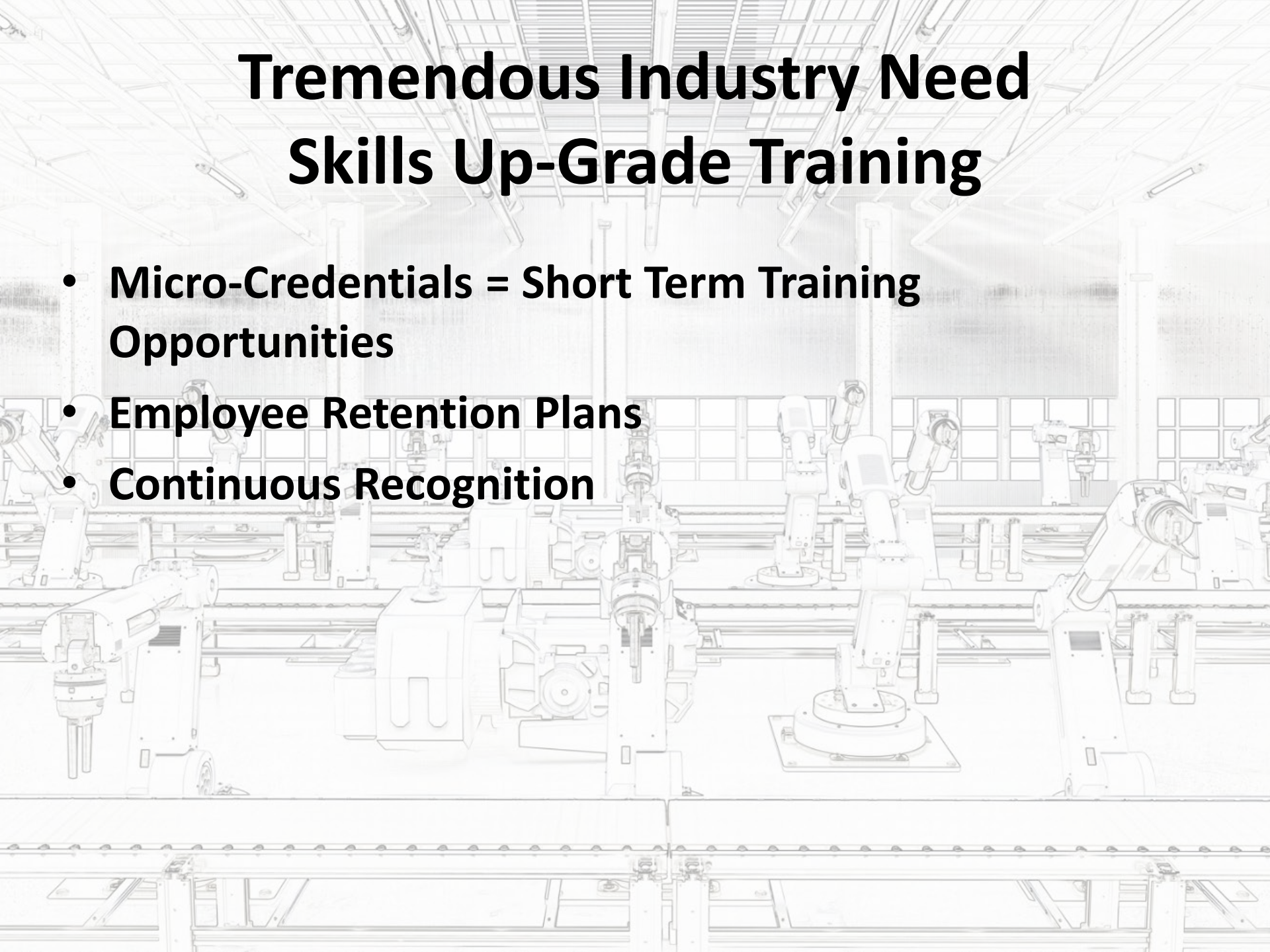
**MSSC CPT/CPT+**  
Certification Fast-Track

# Implementation Timeline

- April 2019 - Associate Certifications Pilot Testing
- August 2019 - Associate Certifications Available
- August 2019- Specialist Certifications Level 1
- 2020 - Specialist Certifications Level 2
- 2020 – Professional Certifications

# **Tremendous Industry Need Skills Up-Grade Training**

- **Micro-Credentials = Short Term Training Opportunities**
- **Employee Retention Plans**
- **Continuous Recognition**



# **Host a Validation Meeting for a New Industry Skill Standard**

- **Contribute to the Nationally-Recognized Smart Automation Industry 4.0 Certification Process**
- **Recognition as a national leader in training**
- **Gain first access to state-of-the industry skills standards**
- **Assure that local company needs are addressed by a nationally-recognized certification**



# **Credential Piloting Beginning April 2019**

- **National PR**
- **Free Testing for Participants**
- **A Way to Market Programs to Local Industry**
- **Feedback on Student Performance**
- **Contact [SACA.org](http://SACA.org) to be involved**

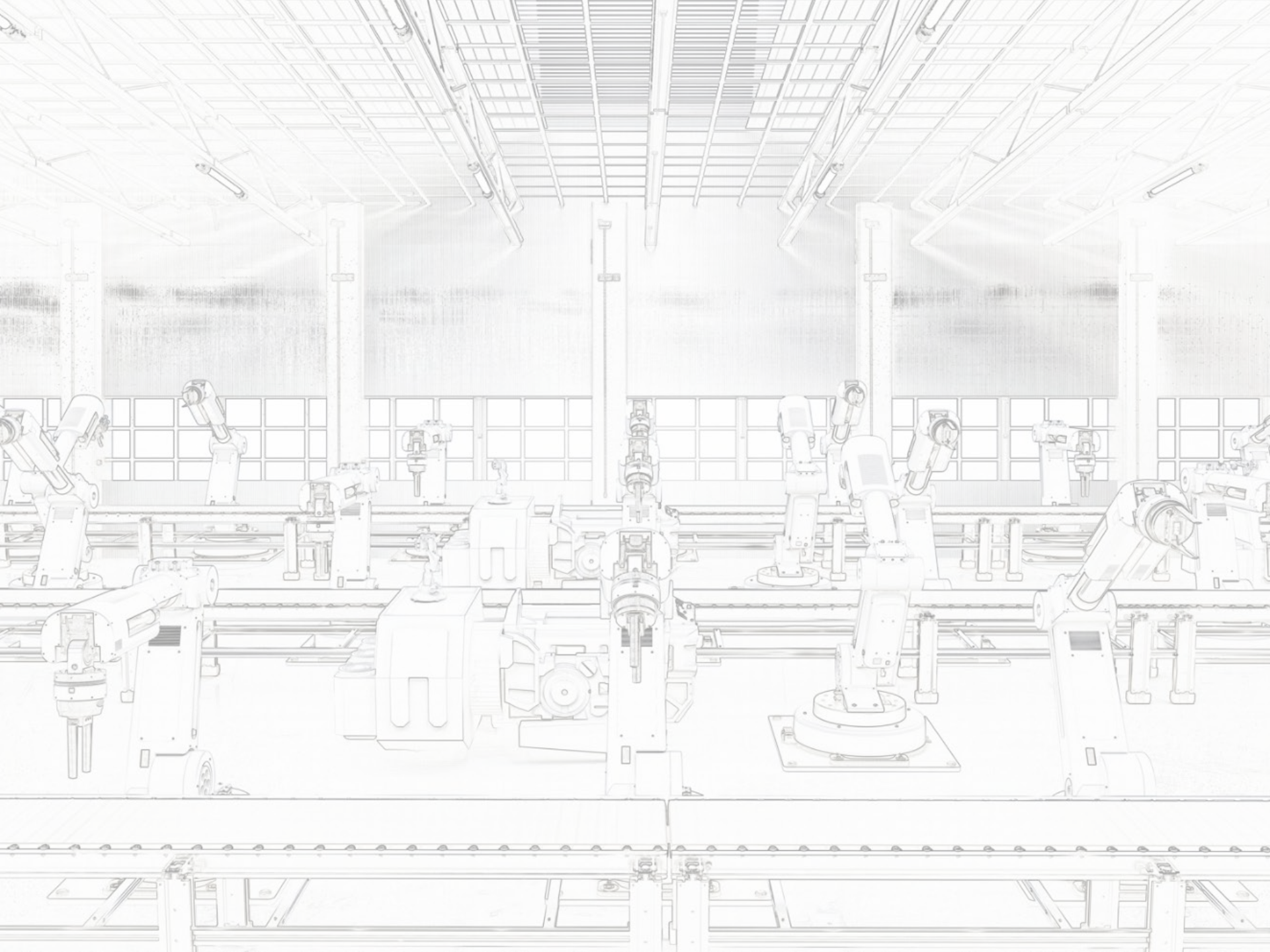
# ***SACA Industry 4.0 Credentials***

- Industry Relevant
- High Quality Credentials
- Tied to Occupations
- Flexible
- Low Cost
- Instructor Training
- Pathways

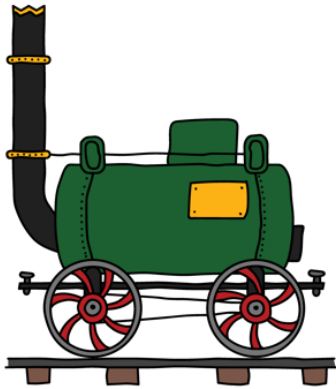




**Questions?**

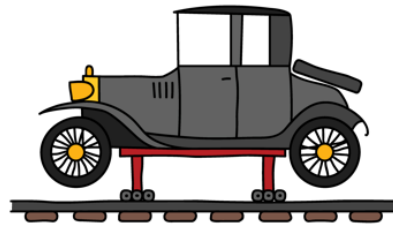


# What is Industry 4.0?



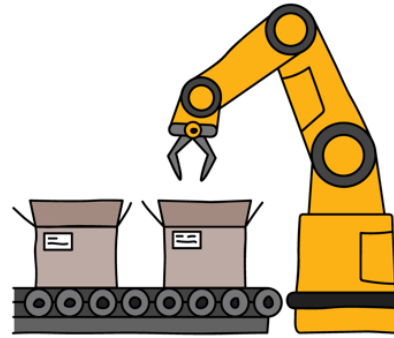
Industry 1.0

The Industrial Revolution begins. Mechanization of manufacturing with the introduction of steam and water power



Industry 2.0

Mass production assembly lines using electrical power



Industry 3.0

Automated production using electronics, programmable logic controllers (PLC), IT systems and robotics



Industry 4.0

The 'Smart Factory.' Autonomous decision making of cyber physical systems using machine learning and Big Data analysis. Interoperability through IoT and cloud technology.