



The Voice of Automation

The Automation Federation (AF) –

Advocating the Automation Profession

*By: Dr. Peggie W. Koon,
2015 Chair, Automation
Federation*

ISA's Advocacy Outreach Arm

- ISA is the founding sponsor of the Automation Federation (*Circa 2006*).
- Global umbrella organization of sixteen (17) member organizations and six (7) working groups. Enable members to more effectively fulfill their missions, advance the science and engineering of automation technologies and applications, and develop the workforce needed to capitalize on the benefits of automation. We are the **"Voice of Automation."**

AF Membership



- Seventeen (17) member organizations, seven (7) working groups
- AF now represents more than **500,000** members worldwide
 - The International Society of Automation (ISA)
 - The Organization for Machine Automation and Control (OMAC)
 - Wireless Industrial Network Alliance (WINA)
 - The American Small Manufacturers Coalition (ASMC)
 - The Continental Automated Building Association (CABA)
 - The Control Systems Integrators Association (CSIA)
 - Electronics Technicians Association (ETA)
 - The Institution of Engineering and Technology (IET)
 - Measurement, Control, & Automation Association (MCAA)

AF Membership (Cont'd)



- The National Career Development Association (NCDA)
- The National Council For Advanced Manufacturing (NACFAM)
- Project Lead The Way (PLTW)
- The Society for Automation, Instrumentation, Measurement, and Control (SAIMC)
- The Society of Manufacturing Engineers (SME)
- The Society of Manufacturing Engineers Education Foundation (SMEEF)
- The Society of Women Engineers (SWE)
- The Association For Career and Technical Education (ACTE)
- **All committed to building the Next Generation of Automation Professionals**

VISION

ISA sets the standard for automation by enabling automation professionals across the world to work together for the benefit of all.

MISSION

Enable our members, including world-wide subject matter experts, automation suppliers, and end-users, to work together to develop and deliver the highest quality, unbiased automation information, including standards, training, publications, and certifications.

STRATEGIC GOALS

CONTENT

ISA will develop timely, relevant content on important topics to meet the career enhancement and professional development needs of the automation community.

DATA

ISA will use data to understand trends, make decisions, and develop products and services that align with market needs.

COOLEST DELIVERY

ISA will deliver industry-leading content that is easily accessible via multiple platforms in an engaging, easy-to-use, and interactive way.

CYBERSECURITY

ISA will be the leading source of standards, training, and expertise related to the cybersecurity of automation and control systems used across industry and critical infrastructure.

ADVOCACY

ISA will increase understanding and awareness of automation across all age groups, resulting in enhanced proficiency of automation as a profession.

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STRATEGIC GOALS

Develop programs to address:

- STEM,
- Workforce development
- Retiree mentoring and contract work
- Advocacy of diversity & inclusion (D&I)



ADVOCACY

ISA will increase understanding and awareness of automation across all age groups, resulting in enhanced proficiency of automation as a profession.

Advocacy Goal: Defined

- Increase understanding and awareness of automation across all age groups, resulting in enhanced proficiency of automation as a profession.

Advocacy Objectives:

- **Objective 1** - Develop programs and initiatives that address STEM Initiatives
- **Objective 2** - Enhance workforce development for young professionals, mid career professionals, and those who want to transition from other careers to automation profession, including veterans
- **Objective 3** - Address aging workforce via retiree mentoring and contract work programs
- **Objective 4** - Develop partnerships and initiatives to advocate diversity in engineering

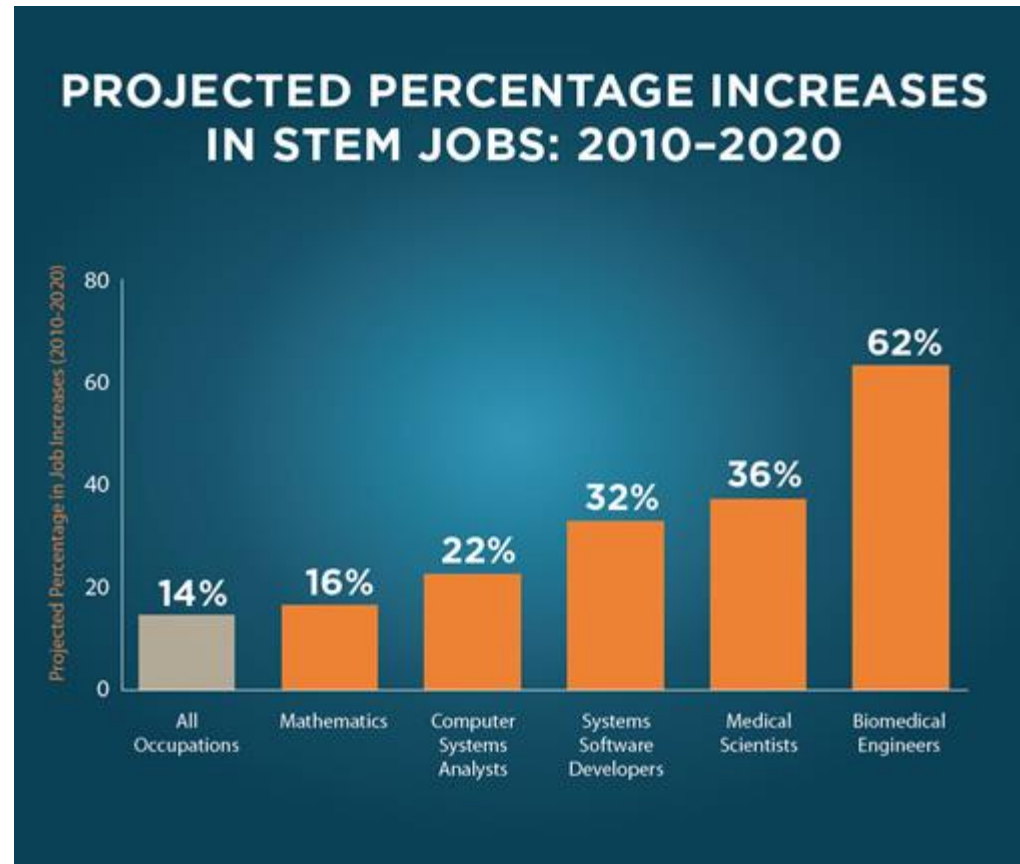
US News STEM Solutions NATIONAL CONFERENCE

- Almost 30 Million people in US have sub-BA credentials
- We must develop programs that bridge the gap so that:
 - Students know how credentials stack up against a traditional four year degree
 - Educators (Local colleges, universities, and technical colleges) need to understand how to merge sub-BA credentials with collegiate course work
 - Employers can gauge competency/proficiency/skill level using all credentials a student might possess
- Significant impact on STEM education and STEM careers

The STEM Issue

Only 16% of US high school students are proficient in Math & Science and are interested in pursuing a STEM Career

www.ed.gov/stem

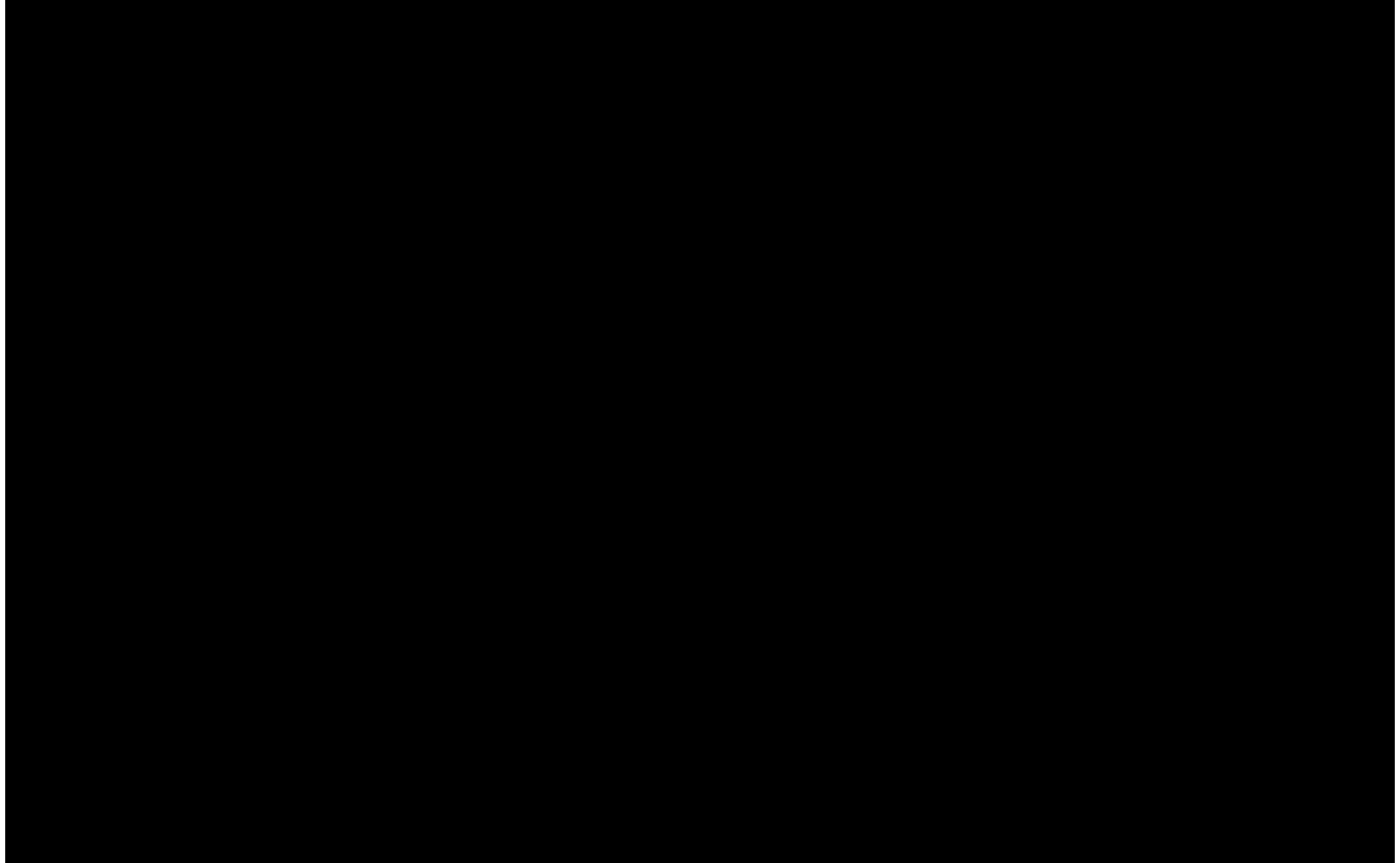


Ten-year employment projections by the US Department of Labor show that of the 20 fastest-growing occupations projected thru 2020, most of them require significant STEM education

FIRST® Alliance

- AF participated in the 2016 FIRST® Championship held in St. Louis. AF staff and volunteers interacted with thousands of young people from around the world to introduce them to future careers in automation
- FIRST® continues to recognize the importance of its Alliance Partnership with the Automation Federation
- **ISA Members can help these young people by volunteering to be a FIRST Mentor, Team Coach, Sponsor or assisting at a FIRST competition**

What is FIRST?



What is FIRST

- <https://www.youtube.com/watch?v=hcS7M4sY0fQ>

How you can help



ISA members can help inspire the next generation by becoming a coach, or even just a one-day volunteer, at a FIRST event or another organization that supports the next generation of engineers

How you can help



- The Automation Federation is committed to building the Next Generation of Automation Professionals
- The Automation Federation has recruited Project Lead The Way, National Career Development Association, and The Association For Career and Technical Education that have committed to building a greater awareness of the importance of the automation profession
- **ISA Members can help by being a Mentor to a PLTW teacher, speak at a Career Counselor event, or take part in a Career Day event at a school**

- What do we know about workforce development?
 - Both a human resources & an economic strategy
 - Economic growth and stability
 - Addresses skills needed by business or industry
 - Can be place-based (for a region) or sector based (for an industry sector)
 - Success requires strong network with community (people), partnerships with academia (education) and industry/businesses
 - Responsibility in US was historically born by government (via public school system); in recent years the effort has been expanded to include colleges, technical schools, employers, and professional organizations (like those in AF)

Workforce Development



What is workforce development education and training?

“...a critical human capital system concerned with

- identifying future needs
- **developing** a productive **workforce**
- identifying and examining the competencies and skill levels of employees at all levels, and
- determining both proficiency and skill gap”

(From the US Government Publishing Office at:

<http://www.gpo.gov/careers/wdet.htm>

SOLUTION: Education and Training

- What is the number one challenge facing industry today, according to experts and research findings?
 - **Attracting and retaining skilled workers**
- Companies will differentiate themselves from the competition with knowledge and skills rather than assets
- A shortage of qualified professionals will be the single largest barrier to growth for companies worldwide

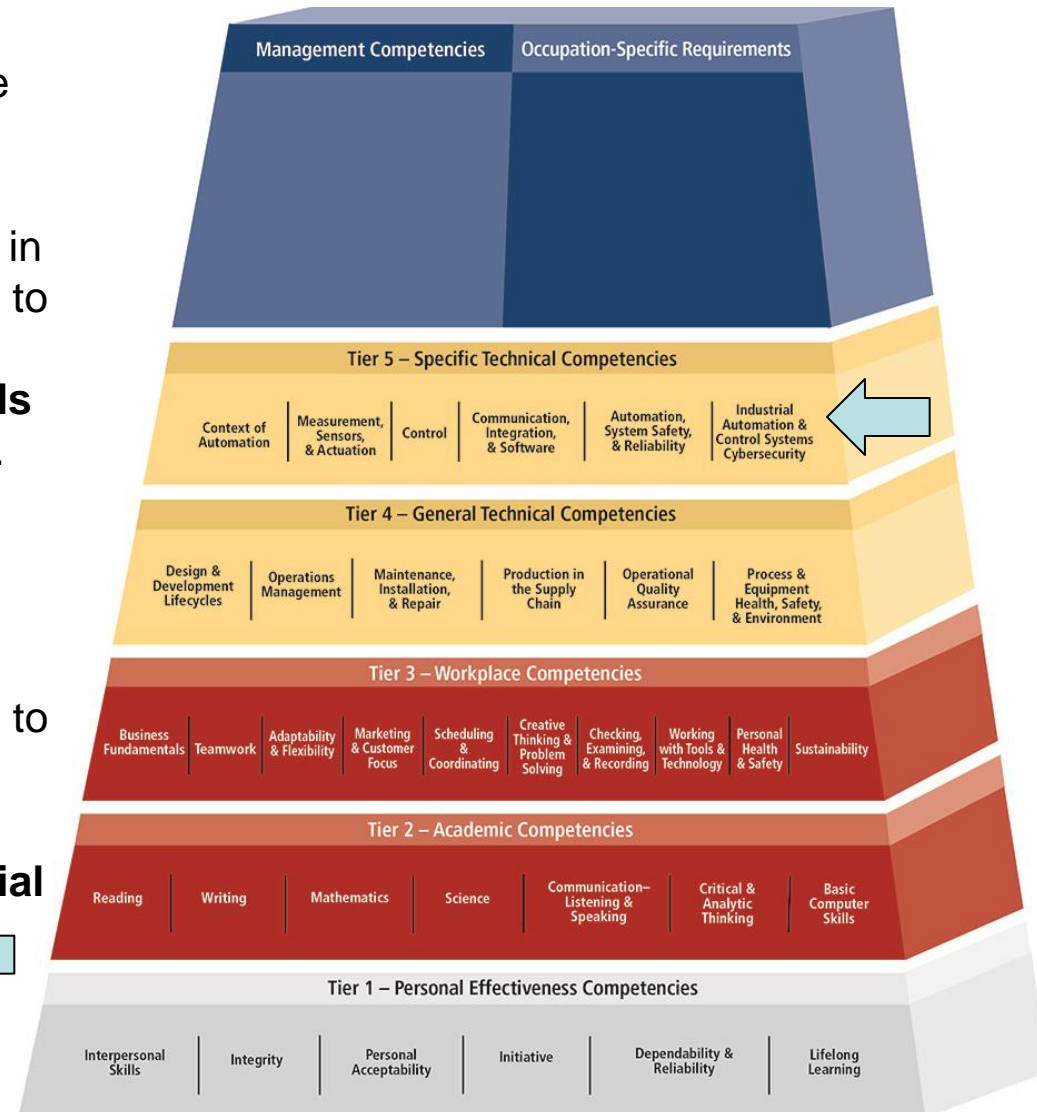
Training and professional development programs have a proven track record of *increasing value, productivity, and retention* of industrial workforces.

The Role of Competency Models

- *What if every STEM career and STEM field had a competency model? Would that help solve the problem? Or would it create a new set of problems?*
- *What about colleges, universities, technical schools?*
- *What should be the response from academia?*
- *Should the Accreditation Board for Engineering and Technology (ABET) look at developing competency based-degrees that encompass both applied/experiential learning and specific course work?*
- *How early in the learning/development process should project/competency-based learning occur?*

Automation Competency Model

- Created in conjunction with the **U.S. Department of Labor**
- Designed to help individuals prepare for **job opportunities** in the automation profession and to aid existing professionals in **attaining the knowledge/skills** for improving job performance.
- Designed to help academic institutions **update their education curriculum** to incorporate the course work necessary to prepare students to **enter a professional field in automation.**
- UPDATED!** to include **Industrial Automation & Control Systems Cybersecurity** as core technical competency.



Automation Competency Model

- American Association of Community Colleges promotes the Automation Competency Model through the AF/AACC Automation Community College Consortium
- The U.S. Department of Labor continues to promote the ACM as one of their most successful efforts to help build the manufacturing workforce.
- U.S. Chamber of Commerce featured the Automation Competency Model in their 2013 Business Horizon Quarterly
- **These efforts promote the Automation Profession and the importance that automation professionals perform across industry sectors**

US Department of Labor Competency Models



A screenshot of a web browser displaying the CareerOneStop Competency Model Clearinghouse website. The browser's address bar shows the URL: www.careeronestop.org/CompetencyModel/competency-models/pyramid-home.aspx. The website header includes the "COMPETENCY MODEL CLEARINGHOUSE" logo, the "careeronestop" logo, and a search bar. A navigation menu contains "Get Started", "Industry Models", "Models in Action", "Tools", and "Find Resources". The main content area features a large group photo of diverse professionals and a section titled "Industry Models" with a list of categories: Building Blocks Model, Accommodation and Food Services, Construction, and Energy and Utilities. Below this is a text block titled "View the competencies that are essential for workplace success." followed by a paragraph about the Employment and Training Administration (ETA) and industry partners. The browser's taskbar at the bottom shows several open "Advocacy Slide Pres....ppt" files and the system clock indicating 11:49 AM on 5/21/2016.

<http://www.careeronestop.org/CompetencyModel/competency-models/pyramid-home.aspx> 22

Successful Partnerships now and in the future

- Partnering with ISA and other member organizations to achieve their goals
 - Federal Government to develop ICS Cybersecurity Framework using IEC62443 series of standards
 - NCMO to develop Mission Critical Operations curriculum to address the growing need for cyber-ready workforce

AF -- Protecting Critical Infrastructure



- Worked with the White House and NIST (the National Institute of Standards and Technology) to create the Cybersecurity Framework as called for in Executive Order 13636
- Successfully advocated for the inclusion of ISA99\IEC 62443 Security Standards as part of the Framework
- Assisted the White House and NIST with the implementation of the Framework which began in 2014
- Assisted NIST and the White House with implementation of the Cybersecurity Enhancement Act of 2014
- Reaches out to community colleges through its [partnership with the American Association of Community Colleges](#) to create the US Automation Community College Consortium and to develop new automation curriculum.

Automation Federation Protecting Critical Infrastructure

The Advocacy of the ISA Cybersecurity Standards has led to a greater awareness of the ISA training resources, products and services

- The White House and NIST have called on the Automation Federation to continue assisting with the implementation of the Framework

Impact on Workforce Development

“We are seeing mission critical positions vacated by the baby boomer generation and there aren’t enough folks trained and ready to take their places.”

Mitchell Sepaugh

Project Manager, NCMCO

(Note: NCMCO is the National Consortium for Mission Critical Operations)

What are Mission Critical Operations?

Mission Critical Operations (MCO) are defined as:

Any operations requiring around-the-clock supervision of systems and aimed at combating the evolving threat of critical infrastructure operations and failure.

Mission Critical Fields	
Chemical	Food and Agriculture
Commercial Facilities	Government Facilities
Communications	Healthcare and Public Health
Critical Manufacturing	Information Technology
Dams	Nuclear Reactors, Materials, and Waste
Defense Industrial Base	Transportation Systems
Emergency Services	Water and Wastewater Systems
Energy	
Financial Services	



Mission Critical Professional Certification

Mission Critical Domains (ISA Mission Critical Professional Certification)

Core Mission Critical Concepts (including Information technologies & concepts, Operational technologies & concepts, IT-OT convergence, Standards bodies & regulations)

Risk Management (including risk fundamentals, identification of assets, and threat assessment, vulnerabilities, risk assessment, Risk management plans)

Safety & Security (including physical safety, public safety, process/functional safety, environmental safety, physical security, cyber security)

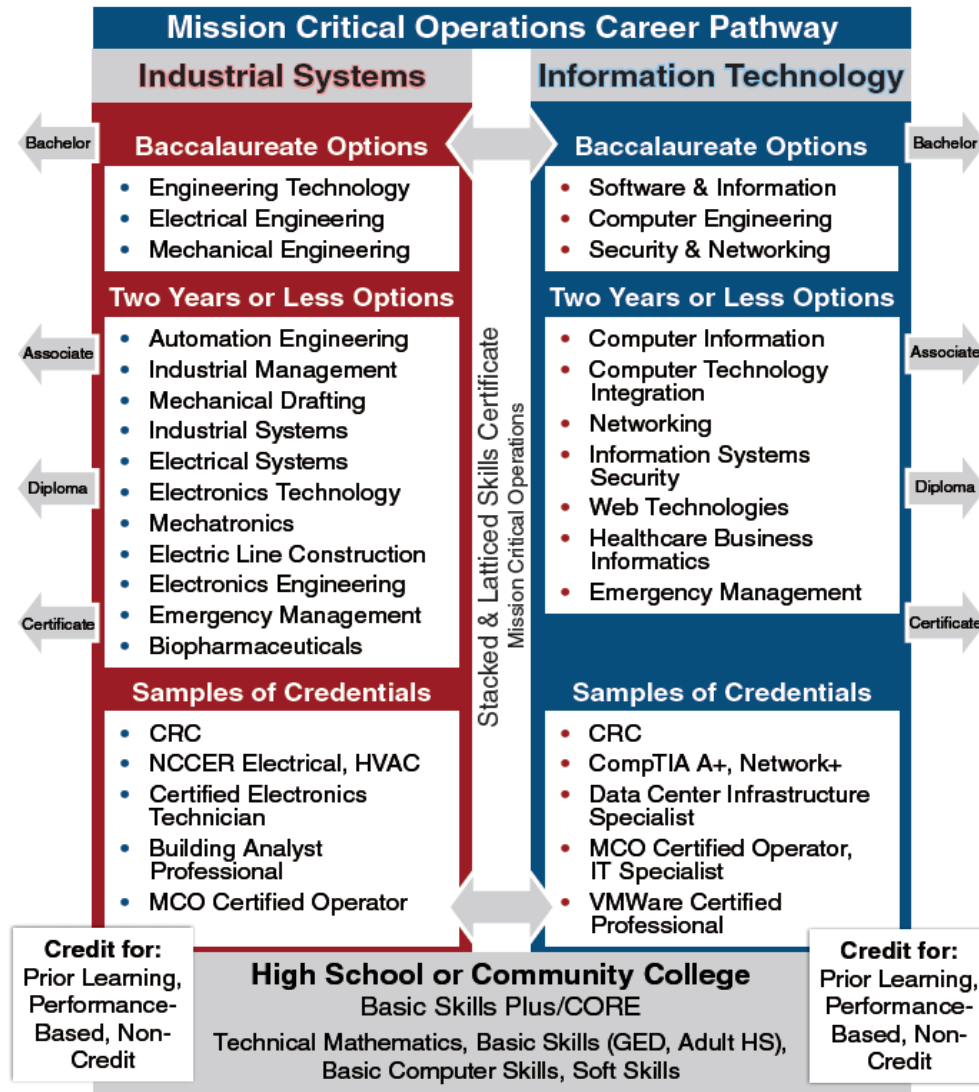
Cleveland Community College

“The goal of a mission critical organization is having a continuous up time of 24 hours a day, times seven days a week, times 365 days a year, and successfully doing this takes diverse skills...everything from IT, project management, baseline skills, mechanical and HVAC, electronics engineering, commodities, Building Management System software, operations, and security.”

Jonathan Davis, Project Manager, NCMCO

Cleveland Community College

- AF Partnership with Cleveland Community College via grant from US Department of Labor
- Focused on two departments -- Industrial Services and Computer Information Technology departments
- Offer classes in everything from facility automation to network security.
- The project directly addresses the need of owners and operators from a wide variety of industry sectors to prepare for, prevent, mitigate, and respond to threats included in the President's Executive Order (EO) 13636: Improving Critical Infrastructure Cyber security.
- Similar program being developed at Moultrie Technical College



Multiple entry and exit points so you can custom tailor your learning experience.

For students in, on, or orbiting the third rock from the sun, these programs will be distance enabled so you can take classes from anywhere.

Is there a need for this type of competency model based workforce development in your business?

Do schools in your area offer this type of mission critical operations training?

Partner Organizations



Advocacy of Diversity & Inclusion



AF/ISA participated at the 42nd NSBE National Conference – over 11,000 participants- including students, employers, speakers

AF partnering with ISA and its other member organizations

Just in 2016 to-date

- Automation Federation Initiatives have **generated over \$600,000 in revenue** for ISA's related products/services
- Automation Federation partnership with the Illinois Manufacturing Excellence Center has generated the opportunity to provide training for IMEC manufacturing clients

How can you help...



“Great leaders... look outward...at the competition, out at the future, out at alternative routes forward. They focus on broad patterns, finding connections, cracks, and then press home their advantage where the resistance is weakest. They must be visionaries, strategic thinkers, activators. When played well, this is without a doubt, a critical role.”
—Marcus Buckingham & Curt Coffman’s, “First Break All the Rules.”

How can you help...

Tell our story...tell your story

Develop programs and initiatives that address STEM Initiatives

ISA Advocacy Goal:

30% of ISA Sections will engage with For Inspiration and Recognition of Science and Technology (FIRST), or its international equivalent or some type of advocacy outreach event in 2016.

For More Information About The Automation Federation

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Thank You!!

