

Automation Engineering Curriculum Policy: Creating a Competitive Automation Profession for the Future

Challenge: One key factor in the ability for manufacturing to compete in the global market is automation. Automation engineers working in industry today are typically degreed in the electrical, mechanical, or chemical vertical engineering disciplines where little to no emphasis is placed on automation in the degree program. Today, the expertise necessary for the job is usually gained over years on the job through mentoring, available training courses, individual certifications, and trial & error with a significant time lag from hire date to useful productivity. The ability to perform well in global competition has placed strong demands on the automation profession. U.S. universities are not keeping up with these workforce demands in that no undergraduate Automation Engineering program currently exists in our country to meet the challenge. Students preparing for a career in automation are receiving a better education outside the US where programs are developing on a broad basis. Without this key ingredient, the automation engineering expertise available today cannot be sustained into the next generation. Creating new university programs has proven to be cumbersome and difficult for many reasons, not the least of which are budget and human resources restraints.

Plan: A career in automation encompasses a cross-over between a variety of engineering fields and disciplines. It is our intent to actively work to establish an accredited Bachelor of Science undergraduate degree program which would give students the multi-disciplinary educational and practical background necessary to begin performing automation engineering work in any industry as a more useful employee at the outset. Our members have been working on assembling draft curriculums for both a four year automation engineering degree and a two year engineering technology degree.

Educational Objectives – Within the first few years after graduation BS graduates will possess:

- Competencies – Adequate skill in tools and techniques that are fundamental to the job, many of which need to be learned after graduation.
- Professionalism – Partnership in the mission and human context of the enterprise; including ethics, effectiveness, initiative, creativity, critical thinking, and awareness of the broad context of the detailed work.
- Balance – A wise self-direction to life, community, and health. A self view that finds the right balance between personal choices, and that energizes and enables self and others.

Program Outcomes – Upon graduation students will have:

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired needs.
- An ability to function on teams with diverse members.
- An ability to identify, formulate, and solve engineering problems.
- An understanding of professional and ethical responsibility.
- An ability to communicate effectively.
- The broad education necessary to understand the impact of engineering solutions in a global and societal context.
- A recognition of, the need for, and an ability to engage in life-long learning.
- A knowledge of contemporary issues.
- Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Next Steps: Improving and educating our future workforce is everyone's responsibility. Federal, state and local governments can give industry, learning institutions, and dedicated proponents a helping hand. The Automation Federation and ISA would like your personal support in securing funds for furthering this issue through the development of various initiatives and programs, such as pilot programs, academic education forums, scholarships, school funding, and grants, etc.

The Automation Federation will be honored to provide this service to policy makers and leaders at any time. Please contact:

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