

# Engineering Technology Certificate Robotics and Manufacturing Automation

Course #	Course Title	Credits	Prerequisites	Semester Offered	Semester Taken	Grade Earned
ENR103	Introduction to Robotics	4	(MAT030 or MAT035), ENL020 & ENL050 or satisfactory basic skills assessment scores	Fall, Spring		
ENR105	Circuit Theory and Analysis	4	MAT041, ENL020 & ENL050 or satisfactory basic skills assessment scores	Fall, Spring		
MAT250	Calculus II	4	MAT240 or MAT185	Varies		
ENR201	Statics	3	ENR101 & MAT240; Co-requisite MAT250	Fall, Spring		
PHY211	University Physics I	4	MAT195; Co-requisite MAT240	Varies		
<b>Total Credits</b>		<b>22</b>				

This certificate has advanced mathematics requirements.

### Overview

Robotics technicians and engineers design and maintain automated robotic systems. These individuals must be knowledgeable in a variety of areas, such as mechanical repair, electric circuit design, and computer programming. This certificate is designed for students who wish to develop and enhance their skills in these areas for employment at companies who have robotic devices or for students who intend on pursuing a Bachelor's degree in engineering or manufacturing. In earning this certificate, students demonstrate competency in designing, building, programming, and testing increasingly complex electro-mechanical robots and manufacturing automation devices.

The education of a robotics technician does not always stop at the college level. Many workers receive specialized training from an employer. Companies that use robots often train workers in the detailed specifics of a particular robotic device or model. This certificate provides the core skills to be successful in these environments.

The certificates offered within the engineering and advanced manufacturing field of studies are designed from a two layer perspective to ensure that a student's skills are aligned with industry and academia. This certificate is a second tier certificate that requires that the student already possess the level one Engineering Technology Certificate (or be able to demonstrate equivalent competences).

### Career Outlook

Robotics technicians and engineers work in many different locations. Some are employed by factories and automation facilities. Some become supervisors or trainers, and provide education about robotic systems to other workers. Individuals with high levels of experience can be hired by robot manufacturers, and provide advice on ways to improve new robotic systems.

This occupational profile is provided by O\*NET.  
[www.onetonline.org/find/quick?s=robotics](http://www.onetonline.org/find/quick?s=robotics)

### Program Outcomes

Upon completion of the Robotics and Manufacturing Automation Certificate students are able to.

- Demonstrate knowledge of robotic design techniques, tools, electronic equipment, and computer hardware and software, including applications and programming.
- Develop robotic path motions to maximize efficiency, safety, and quality.
- Test and troubleshoot robotic systems, using knowledge of microprocessors, programmable controllers, electronics, circuit analysis, mechanics, sensor or feedback systems, hydraulics, or pneumatics.
- Disassemble and reassemble robots or peripheral equipment to make repairs such as replacement of components, sensors, controllers, encoders, and servomotors.
- Perform preventive or corrective maintenance on robotic systems or components and document robotics test procedures and results. Align, fit, or assemble component parts using hand tools, power tools, fixtures, templates, or microscopes.