AZNext
Arizona State University

Closing the Skills Gap to Build the Future Workforce

AZNext is a training program designed to create a bold, innovative, and sustaining workforce development ecosystem that addresses the need for more skilled workers in IT, cybersecurity, and advanced manufacturing roles in Arizona and across the U.S.

Provided at no cost to the participant.
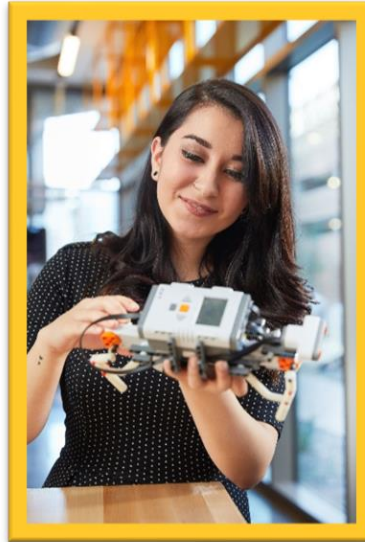
Contact Us

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Interested in Industrial Robotics?

Enroll in a course on Introduction to Robotics in Microelectronics Manufacturing

Why is Robotics in Microelectronics Manufacturing important?

Industrial Clean-room robotics are a critical asset in any semiconductor and micro-electronics manufacturing operation. Cleanrooms for electronics production are amongst the most demanding work environments for both humans and machines. As in every type of factory, industrial robots are intended to operate in high-speed or dangerous environments that humans simply do not have the capacity to perform. The advanced factories of today have heightened the demand for trained technicians and engineers to design, program, troubleshoot and maintain robots that are used in the factory.

Where & How the program is offered?

This is an open enrollment, in-person class that will be offered by the ASU School of Manufacturing Systems & Networks, Mesa AZ. The course will be two 5-hour sessions. First cohort scheduled to start Friday March 3rd 2023 2-5 PM (lecture) 5-7 PM (lab), finishing on Saturday March 4th 10 AM-Noon (lecture) 1-3 PM (lab)

What will you gain?

- **Design of Vacuum Robots**
- **Technical skills and tools you can apply starting your career or in your current job and beyond**
- **ASU Micro-badge**
- **Business communication skills**
- **Problem-solving skills**
- **Opportunities to network with industry leaders**

How to Apply

Link to Apply:

Questions

Email: AZNext@asu.edu

What do I need to know to take this class?

The content of the class is designed in such a way that any student or working professional in advanced manufacturing domain will benefit from this course. No prior programming knowledge or experience is needed.

Program overview

This ten-hour course, instructed by Sangram Redkar, Associate Director and Associate Professor, School of Manufacturing Systems and Networks LINK, introduces the student to the industrial robotics terminology, cleanroom requirements for industrial robotics, vacuum requirements for robots, robotic movements, and test requirements for the use of robots in cleanroom environments. Classroom activities offer a combination of lecture and hands-on laboratory training in robot programming, wafer handling through pick and place tasks, robot calibration and trouble-shooting. This course is a joint venture with and supported by ASU's MADE: Manufacturing, Automation and Data Engineering STC LINK

Competencies	Description
Intro to Industrial Robotics	History of industrial robotics, The global robotics industry, Definitions, standards, and terminology
1) Cleanroom Robotics	Learners explain basic industrial electrical principles. Learners study what a schematic is, the characteristics of schematics, and common symbols used for; Electrical, Fluid, Hydraulic, and Pneumatic.
2) Design Attributes of Atmospheric Robots	Introduction of hand tools commonly associated with preventative and corrective maintenance activities in semiconductor factories. Learners get hands on with common hand tools to learn the safe and proper use. Learners apply knowledge on custom made fixtures with different types of fasteners.
3) Design of Vacuum Robots	Static and Dynamic vacuum barrier, clean drive trains, External and internal leaks, Materials, and surface finishes, Assembly and installation of vacuum robots, Applicable and related standards
4) Kinematics of Industrial Robots	This introductory content will describe how robots move in 3D space with respect to factory operations.
	Laboratory: Learners will apply kinematics of robots through a robot programming exercise. Learners will use kinematic principles to compute forward and inverse kinematics and implement them on SCARA robots.
5) Dynamics & Control of Industrial Robots	Manipulator dynamics, Robot motion control, Networked robots and decentralized robot control.
6) Test & Characterization	Robot calibration and troubleshoot in cleanroom environments. Positional accuracy and repeatability measurements, vibration analysis and mechanical axis decoupling operations.
	Laboratory: Learners will program a SCARA robot for wafer handling pick and place tasks, perform robot calibration, and testing to perform trouble-shooting exercises.
Assessment Test	

Program cost

This program is offered to AZNext participants at NO COST, please keep in mind this class will be filled on a first come, first-serve basis with any additional students being put on a waitlist until seats are available.

Admission Requirements

- **17 years or older**
- **Have a high school diploma or GED**