Robotics/Automated Systems Technology

Degree

- Robotics/Automated Systems Technology (ROB.AUT.AAS) (http://catalog.oaklandcc.edu/programs/robotics-automated-systems-technology/robotics-automated-systems-technology-aas/)

Certificate

- Robotics/Automated Systems Technology (ROB.AUT.CT) (http://catalog.oaklandcc.edu/programs/robotics-automated-systems-technology/robotics-automated-systems-technology-certificate/)

Certificate of Achievement

- Robotics/Automated Systems Technology - Programmable Controllers (ROB.PCT.CA) (http://catalog.oaklandcc.edu/programs/robotics-automated-systems-technology/programmable-controllers-certificate-achievement/)

Robotics/Automated Systems Technology Courses

ROB 1500 Introduction to Robotics Technology .....4 Credit Hours
ESL Placement Level: For English-as-a-Second-Language (ESL) students, placement into ESL 2510 or higher.
This course is an overview of robotic and automated systems technology. The student will be introduced to basic manufacturing techniques, robot terminology, different types of automation, safety, basic robotic programming, interfacing robotic communications, automated work cells, and robotic applications. Robot operations and programming fundamentals will be applied by the students. BILLABLE CONTACT HOURS: 4

ROB 1520 Robotic Maintenance .....4 Credit Hours
ESL Placement Level: For English-as-a-Second-Language (ESL) students, placement into ESL 2510 or higher.
Prerequisite: ROB 1500
Note: Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.
This course is designed to give students a detailed knowledge of robotic mechanical units. The types of gears and gear reduction systems that are used in robots will be studied. Many aspects of robotic mechanical units will be observed, including mechanical adjustments and preventative maintenance. Controller setting and procedures which influence the motion of the robotic manipulator will be investigated. The safety procedures involved in working with robotic mechanical units will be emphasized. BILLABLE CONTACT HOURS: 5

ROB 1620 Industrial Robotic Applications .....4 Credit Hours
ESL Placement Level: For English-as-a-Second-Language (ESL) students, placement into ESL 2510 or higher.
Prerequisite: ROB 1500
Note: Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.
This course offers the opportunity to study, program, and work with stand-alone robots and with robots integrated into work cells. Applications studied will include palletizing and packaging, material joining, material removal and material handling. An in depth study of applications programming will be covered during the semester. Programming will include different methods of error handling and operator interfacing used in robotic applications. Students will be introduced to robotic simulation. BILLABLE CONTACT HOURS: 5

ROB 1640 Interpolated Welding Robotic Application .....4 Credit Hours
ESL Placement Level: For English-as-a-Second-Language (ESL) students, placement into ESL 2510 or higher.
Prerequisite: ROB 1620
Note: Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.
This course will examine the complex motions in robotic applications. Controller frame set-up and programming techniques for interpolated linear and circular motions will be investigated in the lecture. The concepts will be applied in the Robotics Lab to investigate techniques for various types of material removal and joining applications. The course will include lectures on basic welding fundamentals. The student will program and set weld schedules to enable robotic welding applications using Gas Metal Arc Welding (GMAW) and resistance welding. Students will use robotic simulation for complex motions. BILLABLE CONTACT HOURS: 5

ROB 1650 Collaborative Robotics .....2 Credit Hours
ESL Placement Level: For English-as-a-Second-Language (ESL) students, placement into ESL 2510 or higher.
Prerequisite: ROB 1620
Note: Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.
This course explores the application of collaborative robotics for safe and effective interaction with human workers while performing industrial tasks. The setup of the collaborative robot parameters and programming techniques will be applied by the student. Risk assessment will be outlined, and safety systems used in conjunction with the robots will be studied. Various labs and applications are defined in which the student will develop the programs for collaborative robotics. BILLABLE CONTACT HOURS: 3

ROB 1660 Robotic Communications and Machine Vision ..... 4 Credit Hours
ESL Placement Level: For English-as-a-Second-Language (ESL) students, placement into ESL 2510 or higher.
Prerequisite: ROB 1620
Note: Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.
This course will give the student a working knowledge of the various types of industrial sensors incorporated into a complex work cell. The student will utilize point-to-point wiring interfaces, field device networks, and data networks to investigate how controllers are programmed to interact with the types of signals the sensors will supply to the controller. Concepts of machine vision lighting/lensing and programming will be studied and applied to robotic applications. Students will study the use of simulation in programming signal exchanges in robotics applications. BILLABLE CONTACT HOURS: 5

ROB 2040 Programmable Controller Applications .....4 Credit Hours
ESL Placement Level: For English-as-a-Second-Language (ESL) students, placement into ESL 2510 or higher.
This class will introduce the fundamentals of Programmable Logic Controller (PLC) operations, including symbology and programming techniques. PLC hardware and data structures will be presented. Methods of using the programming interface to troubleshoot applications will be emphasized. The student will write, enter, and execute application programs using the programmable controllers and Human Machine Interface (HMI). The use of the Robotics Lab equipment will give the student practical programming and troubleshooting skills used in the maintenance of automated systems. BILLABLE CONTACT HOURS: 5

ROB 2140 Advanced Programmable Controllers Applications .....4 Credit Hours
ESL Placement Level: For English-as-a-Second-Language (ESL) students, placement into ESL 2510 or higher.
Prerequisite: ROB 2040
Note: Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.
The course will be structured to provide the student with an understanding of the relationship between real time control systems and industrial devices and machines. The advanced instruction set of programmable controllers will be studied relevant to concepts and structures of automated control systems. Various applications will be defined in which the student will develop the written programs for each hardware and software specification of the process problems, including field devices, data networks, and Human Machine Interfaces (HMI). The use of the Robotics Lab equipment will give the student practical programming and troubleshooting skills used in the maintenance of automated systems. BILLABLE CONTACT HOURS: 4

ROB 2400 Robotic Automated Systems Applications .....4 Credit Hours
ESL Placement Level: For English-as-a-Second-Language (ESL) students, placement into ESL 2510 or higher.
Prerequisite: ROB 1640 and ROB 1660
Note: Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.
This course provides the system aspects for applying robots in automation. Topics include the process requirements, programming, and communication for implementing robotic applications. The student will gain practical information on how these systems are interfaced together mechanically, electrically and software wise. Robotic simulation and machine vision sensors will be utilized by the students in robotic work cell applications. BILLABLE CONTACT HOURS: 4

ROB 2500 Robotic Controller Maintenance .....4 Credit Hours
ESL Placement Level: For English-as-a-Second-Language (ESL) students, placement into ESL 2510 or higher.
Prerequisite: ROB 1500 or consent of instructor.
Note: Prerequisites for courses in this department are not automatically waived for College Guest students and students with a bachelor's degree or higher from a U.S. institution.
This course will cover the maintenance aspect of robot controllers. Students will study the techniques and components involved in maintenance including: controller settings; electrical/electronic architecture; analysis and troubleshooting techniques of robot controllers. Students will utilize observations, documentation, and prints to diagnose and correct problems on the robotic controllers. BILLABLE CONTACT HOURS: 5