

University of Arkansas - Fort Smith
5210 Grand Avenue
P. O. Box 3649
Fort Smith, AR 72913-3649
479-788-7000

General Syllabus

ELTE 24103 Robot Operations and Maintenance

Credit Hours: 3

Lecture Hours: 2

Laboratory Hours: 2

Prerequisite(s): None

Effective Catalog: 2019-2020

I. Course Information

A. Catalog Description

Teaches the basic operations and programming of a robot using a teach pendant as well as the robotic cell hazards, health and safety and maintenance requirements.

B. Additional Information

The promise of high productivity factories is being realized today by the use of robotics. Since the first industrial robot was installed at a U.S. automotive plant in 1961, robotics technology has become an integral factor in most types of manufacturing. Robots are widely used for applications that require extreme precision, for repetitive and tedious tasks, and for work that is considered unpleasant or dangerous for humans. Robots are also vital components of flexible manufacturing systems, which allow robotic configurations to be quickly changed to meet production requirements.

The factory engineer or technician of today is faced with the selection, application, operation, programming, documentation, and troubleshooting of robot systems on a factory floor. In many factories, even the operators are taught basic operation of the robot so they can start a process safely and effectively. In the factory of the future, robotic literacy may become as important as personal computer literacy has become in the office of today.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Practice all areas of safety as they pertain to the robot.
2. Properly startup, operate, and shut down the robot.
3. Properly identify and recover from robot errors.

4. Perform program storage and retrieval.
5. Manual and program control of inputs and outputs.
6. Create tool center point data.
7. Edit programmed positions.
8. Create a program with subroutine structure.
9. Perform editing techniques.
10. Program instructions, such as, output control, decision making, operator dialog, and clock.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking Skills - Students will analyze and troubleshoot failures in robot systems using the resources of the robotics lab. Students will determine failures in robot hardware and software.

Quantitative Reasoning - Students will solve various robot positioning and software problems using mathematics.

III. Major Course Topics

- A. Safety precautions used while programming and program execution
- B. Operating controls and indicators on the robot controller
- C. Positioning the robot by use of the joystick control
- D. Program creation procedures
- E. Program modification procedures
- F. Proper safety precautions while performing repairs
- G. Operation of robot control and mechanical unit
- H. Description and operation of mechanical components
- I. How to use manual for repair and ordering parts