

**University of Arkansas - Fort Smith**  
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## **General Syllabus**

### **ELEC 2423 Robot Programming II**

Credit Hours: 3

Lecture Hours: 2

Laboratory Hours: 2

Prerequisite: ELEC 2413 Robot Operations and Maintenance

Effective Catalog: 2019-2020

#### **I. Course Information**

##### **A. Catalog Description**

Provides instruction in high level programming features and techniques. Includes off-line programming software for simulating robot layout and reach capabilities and robot program simulation.

##### **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 safety as it pertains to the robot system.
2. Create, Configure and download system software.

3. Create and use Modules, Routines and Data
4. Create advanced Tool Center Points (TCP).
5. Program with Search Instructions.
6. Program with Position Displacement Instructions.
7. Program using Error Handling.
8. Program Interrupt Instructions, Traps and Events.
9. Use Joint Configuration Instructions
10. Setup and Program World Zones.
11. Use Motion Control Instructions.

## **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. Building and configuring Robot Software
- B. Online and offline program editing
- C. Advanced declarations of modules, routines and data
- D. Programming with interrupts and traps
- E. Searching and program displacements
- F. Error handling, backward handling and undo handling
- G. Advanced motion Instruction
- H. World zones