



COURSE OUTLINE

DIVISION: Workforce Development (WFD)

COURSE: RMA 1210 Robotics I

Effective Date: Spring 2025

Submitted Date: Aug-24

Credit Hours: 2

IAI Number (if applicable): N/A

Complete all that apply or mark "None" where appropriate:

Prerequisite(s): None.

Enrollment by assessment or other measure? Yes No

If yes, please describe:

Corequisite(s): None.

Pre- or Corequisite(s): None.

Consent of Instructor: Yes No

Delivery Method: <input checked="" type="checkbox"/> Lecture	1 Contact Hours (1 contact = 1 credit hour)
<input type="checkbox"/> Seminar	0 Contact Hours (1 contact = 1 credit hour)
<input checked="" type="checkbox"/> Lab	2 Contact Hours (2-3 contact = 1 credit hour)
<input type="checkbox"/> Clinical	0 Contact Hours (3 contact = 1 credit hour)
<input type="checkbox"/> Practicum	0 Contact Hours (2-4 contact = 1 credit hour)
<input type="checkbox"/> Internship	0 Contact Hours (5-10 contact = 1 credit hour)

Offered: Fall Spring Summer

CATALOG DESCRIPTION:

This is the first of a two-course sequence covering traditional robotic programming using teach pendants, collaborative robot programming, and the complete integration of robots within a flexible manufacturing system.

This course focuses on the technology and application of robots and automation in the modern manufacturing environment. It will provide a thorough understanding of robotic hardware and software and robotic cell design. It will cover safety aspects, production use, and robot types. It will explore common application types, cell components, and the teach pendant. We will go through the basic programming, jogging, and starting the basic programming.

ACCREDITATION STATEMENTS AND COURSE NOTES:

None.

COURSE TOPICS AND CONTENT REQUIREMENTS:

- I. Industrial and Factory Business Systems
- II. Machine System and Design
- III. Applications

INSTRUCTIONAL METHODS:

- Lecture
- Discussion
- Demonstration

EVALUATION OF STUDENT ACHIEVEMENT:

- Quizzes
- Tests
- Labs
- Projects

INSTRUCTIONAL MATERIALS:

Textbooks

Programming Fanuc Robots for Industrial Applications 1st edition, ISBN: 978-0-8269-3412-3

Resources

Festo (LMS) (Lab trainer)

Amatrol (LMS) (Lab trainer)

LEARNING OUTCOMES AND GOALS:

Institutional Learning Outcomes

- 1) Communication – to communicate effectively.
- 2) Inquiry – to apply critical, logical, creative, aesthetic, or quantitative analytical reasoning to formulate a judgement or conclusion.
- 3) Social Consciousness – to understand what it means to be a socially conscious person, locally and globally.
- 4) Responsibility – to recognize how personal choices affect self and society.

Course Outcomes and Competencies

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

1. Understand the safety related to robots and robot cells
 - 1.1. Define a robot and a robot cell
 - 1.2. Define types and their operation
 - 1.3. Define operator interfaces and teach pendant
 - 1.4. Describe the work envelope
 - 1.5. Understand interlocks, estops, and status signaling

2. Identify and list the main components of a robot
 - 2.1. Define and show knowledge of the Power Source
 - 2.2. Define and show knowledge of Actuators
 - 2.3. Define and show knowledge of Sensors
 - 2.4. Define and show knowledge of the Control System
 - 2.5. Define and show knowledge of End Effectors

3. Understand robot operation
 - 3.1. Demonstrate a proper power-up
 - 3.2. Define and show knowledge of the jog function
 - 3.3. Demonstrate the proper way to reset faults
 - 3.4. Explain the purpose of a controller in a robotic system

4. Robot Frames and Starting Programs
 - 4.1. Understand referencing frames
 - 4.2. Create tool frames
 - 4.3. Create user frames
 - 4.4. Understand and define different file types
 - 4.5. Set up a program
 - 4.6. Operate a program