

COURSE OUTLINE  
**CIM 102**  
**Automation and Productions Controls**

**I. Catalog Statement**

Computer Integrated Manufacturing 102 is the continuation of electronic control automation systems, emphasizing the terms, principles, and techniques used in automated manufacturing processes. Programmable logic control applications are emphasized in central system industrial design.

Total Course Units – 1.5

Total Lecture Hours – 48

Prerequisite: Computer Integrated Manufacturing 101

**II. Course Entry Expectations**

Skill Level Ranges: Reading 5; Writing 5; Listening/Speaking 5; Math 4.

Prior to enrolling in the course, the student should be able to:

1. demonstrate skills in the essentials of robotics technology;
2. program and operate various types of CIM robots in both dependent and work cell arrangements;
3. measure knowledge of fundamental robotics concepts by attaining satisfactory scores on both the mid-term and final comprehensive written examinations.

**III. Course Exit Standards**

Upon successful completion of required coursework, the student will be able to:

1. state the essentials of automation and industrial production control;
2. compare and contrast industrial control components and processes;
3. analyze the programmable logic control trainer, using ladder logic;
4. analyze technical applications and concepts of automation production controls.

**IV. Course Content**

**Total Faculty Contact Hours = 48**

- |  |  |              |
|--|--|--------------|
| A. Introduction                                |  | 9 hours      |
| 1. Automation                                  |  |              |
| 2. Industrial control fundamentals             |  |              |
| 3. Processes and system components             |  |              |
| <br>B. Structure and theory of control systems |  | <br>13 hours |

1. Signal conditioning
2. Controllers
3. Sensors
4. Transducers and actuators
- C. Computer control 13 hours
  1. Microcontrollers
  2. Programming
  3. Programmable controllers
    - a. Sequential Logic Controller (SLC) 100
    - b. Programmable Logic Controller trainer (PLC)
- D. Industrial applications 13 hours
  1. Automated systems
  2. Discrete, batch, and continuous control process
  3. Real-time operations

**V. Methods of Instruction**

The following instructional methodologies may be used in the course:

1. classroom lecture/online;
2. co-operative learning through group problem solving;
3. audio-visual presentations;
4. field trips to automated industrial sites.

**VI. Out of Class Assignments**

The following out of class assignments may be used in the course:

1. homework and reading assignments;
2. complete a research paper on robotics.

**VII. Methods of Evaluation**

The following methods of evaluation may be used in the course:

1. weekly quizzes;
2. midterm;
3. 2 ½ hour written final examination;
4. research project.
5. laboratory notebook check.

**VIII. Textbook**

**IX. Student Learning Outcomes**

1. Student will understand the basic functions of a computer automated robot.

2. Student will demonstrate knowledge of the controllers and sensors in order to program a computer automated robot.
3. Student will describe the functions and uses for computer automated machinery.
4. Student will research the robotic and computer automated industries to predict the future of this field.