

COURSE OUTLINE  
**CIM 101**  
**Introduction to Robotics**

**I. Catalog Statement**

Computer Integrated Manufacturing 101 is an introductory course that provides a comprehensive study of the fundamentals of industrial robotics. It prepares the student for more advanced studies in robotic automation and related technologies. Specific areas of concentration include power and positioning of robots, robot actuators and motors, motion control, industrial electronics, and micro-controller technology, communication interfacing, programming concepts, and industry applications.

Total Course Units – 1.5

Total Lecture Hours – 48

Prerequisite: Eligibility for English 120 or ESL 151.

**II. Course Entry Expectations**

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

**III. Course Exit Standards**

Upon successful completion of required coursework, the student will 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.

**IV. Course Content**

**Total Faculty Contact Hours = 48**

- |           |   |          |
|-----------|---|----------|
| <b>A.</b> | Introduction                                    | 10 hours |
|           | 1. Robotics revolution                          |          |
|           | 2. Artificial intelligence                      |          |
|           | 3. Careers in robotics                          |          |
| <b>B.</b> | Principles of robotics                          | 19 hours |
|           | 1. Robots defined                               |          |
|           | 2. Classification of robots                     |          |
|           | 3. Coordinate geometry for robot motion control |          |
|           | 4. Elements of robot systems                    |          |
|           | 5. End effectors                                |          |

6. Motion envelopes and work cell parameters

C. Power and positioning systems

19 hours

1. Motors and generators

2. Control systems

3. Servo systems

4. Robot controllers

5. Robot programming

## 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 trip 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. midterm project: complete a research term paper on robotics;
3. final project: put together a demonstration of robotic applications and their practical uses.

## VII. **Methods of Evaluation**

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

1. quizzes;
2. midterm;
3. 2 ½ hour written final examination;
4. midterm and final essays.

## VIII. **Textbook**

## IX. **Student Learning Outcomes**

1. Student will understand the practical uses and future applications for robotics.
2. Student will demonstrate knowledge of the robotics industry.
3. Student will demonstrate robotic programming to perform useful applications.
4. Student will classify and identify different robotic control systems.