**Course Title:** Robotics

**Department:** Advanced Manufacturing Technology

**Curriculum:** Technology Studies

<table>
<thead>
<tr>
<th>Course Code: (eg. ACC*101)</th>
<th>MFG*140</th>
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<tbody>
<tr>
<td><strong>Course Type:</strong> X</td>
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<tr>
<td>A: Clinical   B: Lab   D: Distance Learning</td>
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<td>I: Individual/Independent   L: Lecture   N: Internship</td>
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<td>M: Seminar   P: Practicum   U: Studio</td>
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<tr>
<td>X: Combined Lecture/Lab   Y: Combined Lecture/Lab</td>
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<tr>
<td>Clinical/Lab   Z: Combined Lecture/Studio</td>
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| **Elective Type:** G |

| **Credit Hours:** 3 |
| **Developmental:** (yes/no) No |
| **Lecture:** 1.5 |
| **Clinical:** 0 |
| **Lab:** 1.5 |
| **Studio:** 0 |
| **Other:** 0 |
| **TOTAL:** 3 |

| **Class Maximum:** 24 |
| **Semesters Offered:** Fall |

**Prerequisites:** None

**Corequisites:** None

**Other Requirements:** None

**Catalog Course Description:** Robotics provides the student with a brief history of the application of Robotics to the manufacturing process to date and a vision of future applications of Robotics. Robotics provides an overview of the Robotic hardware, software, and programming necessary to specific applications. Robotics reviews the following: electromechanical systems, fluid power systems, sensing systems, end-of-arm tooling, PLC’s, digital electronics, programming, and industrial applications.

**Topical Outline:**

1. Introduction to Industrial Robotics  
2. Fundamentals of Robotics  
3. Programming the Robot  
4. Industrial Applications  
5. The Role of Robots in Today’s Manufacturing  
6. Electromechanical Systems  
7. Demonstrate an understanding of the role of fluid power systems in manufacturing.
Upon successful completion of this course, the student will be able to do the following:

COURSE:
1. demonstrate an understanding of robotic history, early robots, and the role of the robot in industry
2. demonstrate an understanding of the complex robotic system by breaking the system down into subsystems
3. discuss the concepts and methods of programming the robot
4. explore industrial applications of robots through the integration of robotics into the manufacturing process
5. discuss the role of robotics in today’s customer-driven manufacturing
6. discuss the electromechanical system and its role in automation and the use of robots
7. demonstrate an understanding of the role of fluid power systems in manufacturing
8. demonstrate a basic understanding of robotic maintenance, including hydraulic, pneumatic, electrical power systems, and electronic control systems
9. demonstrate an understanding of the use of sensors to give robots a higher level of intelligence by improving decision-making capabilities
10. explore the use of end-of-arm tooling as a tool for robot grasping, lifting, transporting, and maneuvering
11. demonstrate an understanding of the digital electronics used to store information, count, encode, and decode as it applies to robotics
12. explore the use of the programmable logic controller as a device for controlling the robot
13. demonstrate an understanding of robot interfacing with other production equipment
14. explore the future of robotics including computer-integrated manufacturing

PROGRAM: (Numbering reflects Program Outcomes as they appear in the college catalog)

Electronics Technology Certificate and A.S. Degree
1. Demonstrate an understanding of Shop Safety.

2. Demonstrate an understanding the theory of electrical structure, voltage, current, resistance, and electrical circuit and their measurement.

3. Demonstrate an understanding of the basic laws of arithmetic.

4. Demonstrate an understanding of several number systems and codes that are the foundation of digital theory and digital applications.

Outcomes:
Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.
5. Make comparisons with personal computers; as well as, develop an understanding of its origin and growth since conception.

6. Demonstrate an understanding of the fundamentals of Automated Manufacturing systems.

**GENERAL EDUCATION:** (Numbering reflects General Education Outcomes as they appear in the college catalog)

No General Education outcomes.

### Evaluation:
List how the above outcomes will be assessed.

Assessment will be based on the following criteria:
tests and quizzes

### Instructional Resources:
List library (e.g. books, journals, online resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.

**Required:** Robotics and electronics equipment.

**Desired:** None

### Textbook(s)