Washtenaw Community College Comprehensive Report

ROB 101 Robotics I - I
Effective Term: Fall 2022

Course Cover

College: Advanced Technologies and Public Service Careers
Division: Advanced Technologies and Public Service Careers
Department: Advanced Manufacturing
Discipline: Robotics
Course Number: 101
Org Number: 14430
Full Course Title: Robotics I - I
Transcript Title: Robotics I - I
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Three Year Review / Assessment Report
Change Information:
    Consultation with all departments affected by this course is required.
    Course description
    Outcomes/Assessment
    Objectives/Evaluation
Rationale: We are updating the master syllabus with newer content so that we can assess it.
Proposed Start Semester: Fall 2022
Course Description: In this hands-on course, students will learn to operate an industrial robot and create entry-level robot programs. The primary emphasis of this course is to introduce students to industrial robotics and automated manufacturing. Student will learn to utilize different jog modes, tool center points and discrete inputs and outputs as well as how these factors affect a robot's motion path. Students with technology interests that enjoy working with their hands like gaming, manipulating code, robotics, and 3D printing are suited for this line of work. This is the first course of the robotics series.

Course Credit Hours

Variable hours: No
Credits: 2
Lecture Hours: Instructor: 15 **Student:** 15
Lab: Instructor: 30 **Student:** 30
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 45 **Student:** 45
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites

General Education
Degree Attributes
Statewide articulation approved

Request Course Transfer
Proposed For:

Student Learning Outcomes

1. Identify different parts of an industrial robot, classifications of industrial robots and types of automation.
   ### Assessment 1
   Assessment Tool: Outcome-related module quiz
   Assessment Date: Winter 2023
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Answer key
   Standard of success to be used for this assessment: 75% of students will score 75% or higher.
   Who will score and analyze the data: Departmental faculty
   ### Assessment 2
   Assessment Tool: Outcome-related questions on the final exam
   Assessment Date: Winter 2023
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Answer key
   Standard of success to be used for this assessment: 75% of students will score 75% or higher.
   Who will score and analyze the data: Departmental faculty

2. Identify and describe end of arm tooling for different robot applications.
   ### Assessment 1
   Assessment Tool: Outcome-related questions on the final exam
   Assessment Date: Winter 2023
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Answer key
   Standard of success to be used for this assessment: 75% of students will score 75% or higher.
   Who will score and analyze the data: Departmental faculty
   ### Assessment 2
   Assessment Tool: Outcome-related multiple-choice and short answer module quiz questions
   Assessment Date: Winter 2023
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Answer key
   Standard of success to be used for this assessment: 75% of students will score 75% or higher.
   Who will score and analyze the data: Departmental faculty

3. Recognize and sequence parts of an entry-level robot program.
   ### Assessment 1
   Assessment Tool: Outcome-related questions on the final exam

Assessment Date: Winter 2023
Assessment Cycle: Every Three Years
Course section(s)/other population: All sections
Number students to be assessed: All students
How the assessment will be scored: Answer key
Standard of success to be used for this assessment: 75% of students will score 75% or higher.
Who will score and analyze the data: Departmental faculty

Assessment 2

Assessment Tool: Outcome-related multiple-choice and short answer module quiz questions
Assessment Date: Winter 2023
Assessment Cycle: Every Three Years
Course section(s)/other population: All sections
Number students to be assessed: All students
How the assessment will be scored: Answer key
Standard of success to be used for this assessment: 75% of students will score 75% or higher.
Who will score and analyze the data: Departmental faculty

Course Objectives

1. Identify different types of automation.
2. Identify parts of an industrial robot.
3. Identify classifications of industrial robots.
4. Classify industrial robots.
5. Create tool center points.
6. Utilize different types of tool center points.
7. Identify the difference between armloads and payloads.
8. Identify different end of arm tooling design considerations.
9. Identify how compliance affects the tool center point and the robot program.
10. Identify different robot applications and types of tooling.
11. Create basic motion routines.
12. Identify the different parts of a movement instruction.
13. Identify how to utilize different motion types.
14. Identify how the motion speed will affect the robot's motion path.
15. Identify how the termination type will affect the robot's motion path.
16. Identify how the tool center point will affect the robot's motion path.

New Resources for Course

Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom

Reviewer	Action	Date
Faculty Preparer:		
Sean Martin	*Faculty Preparer*	*Feb 08, 2022*
Department Chair/Area Director:		
Allan Coleman	*Recommend Approval*	*Feb 09, 2022*
Dean:		
Jimmie Baber	*Recommend Approval*	*Feb 10, 2022*

Curriculum Committee Chair:

Randy Van Wagnen   *Recommend Approval*   *May 31, 2022*

Assessment Committee Chair:

Shawn Deron   *Recommend Approval*   *Jun 13, 2022*

Vice President for Instruction:

Kimberly Hurns   *Approve*   *Jun 14, 2022*

ROB 101 Robotics I - I
Effective Term: Winter 2017

Course Cover

Division: Advanced Technologies and Public Service Careers
Department: Industrial Technology
Discipline: Robotics
Course Number: 101
Org Number: 14430
Full Course Title: Robotics I - I
Transcript Title: Robotics I - I
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Three Year Review / Assessment Report
Change Information:
   Consultation with all departments affected by this course is required.
   Course description
   Outcomes/Assessment
Rationale: Periodic review.
Proposed Start Semester: Winter 2017
Course Description: This is the first course of the robotics series. It is a beginning level course where students are exposed to various aspects of industrial robots and automated manufacturing. Studies include an introduction to hands-on programming using industrial robotics. This course contains material previously taught in ROB 121. ROB 101 is generally offered in the first 7 1/2 week session.

Course Credit Hours

Variable hours: No
Credits: 2
Lecture Hours: Instructor: 30 **Student:** 30
Lab: Instructor: 15 **Student:** 15
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 45 Student: 45
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites

General Education

Degree Attributes
 Statewide articulation approved

Request Course Transfer
    Proposed For:

Student Learning Outcomes

1. Identify proper applications for automation.
        Assessment 1
            Assessment Tool: departmental exam
            Assessment Date: Fall 2016
            Assessment Cycle: Every Three Years
            Course section(s)/other population: all sections
            Number students to be assessed: all students
            How the assessment will be scored: answer key
            Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
            Who will score and analyze the data: Departmental faculty

2. Identify suitable methods of production.
        Assessment 1
            Assessment Tool: departmental exam
            Assessment Date: Fall 2016
            Assessment Cycle: Every Three Years
            Course section(s)/other population: all sections
            Number students to be assessed: all students
            How the assessment will be scored: answer key
            Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
            Who will score and analyze the data: Departmental faculty

3. Recognize limitations and capabilities of industrial robots.
        Assessment 1
            Assessment Tool: departmental exam
            Assessment Date: Fall 2016
            Assessment Cycle: Every Three Years
            Course section(s)/other population: all sections
            Number students to be assessed: all students
            How the assessment will be scored: answer key
            Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
            Who will score and analyze the data: Departmental faculty

4. Recognize the key historical events and timeframe in the development of robotics.
   Assessment 1
   Assessment Tool: departmental exam
   Assessment Date: Fall 2016
   Assessment Cycle: Every Three Years
   Course section(s)/other population: all sections
   Number students to be assessed: all students
   How the assessment will be scored: answer key
   Standard of success to be used for this assessment: 70% of the students will score 70% or higher.
   Who will score and analyze the data: Departmental faculty

5. Write entry level robot programs.
   Assessment 1
   Assessment Tool: Student written robot program.
   Assessment Date: Fall 2016
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections.
   Number students to be assessed: All students enrolled.
   How the assessment will be scored: Department developed rubric.
   Standard of success to be used for this assessment: 70% of the students will score a 3 of 5 or higher on all five areas.
   Who will score and analyze the data: Department faculty.

Course Objectives

1. Define an industrial robot.
2. Name at least three important inventions that led to the development of the robot and include the year of the invention.
3. Describe the difference between hard automation and flexible automation.
4. Identify rectangular, cylindrical, spherical, articulated and SCARA robots.
5. Describe why the popularity of the robot was delayed until 20 years after its first installation.
6. Name five applications for industrial robots.
7. Describe the difference between open loop and closed loop control systems.
8. Describe two major differences between pneumatic and hydraulic systems.
9. Identify the capabilities and advantages of industrial robots.
10. Recognize the disadvantages of industrial robots.
11. Program basic robot actions.

New Resources for Course

Course Textbooks/Resources
Textbooks
Manuals

Periodicals
Software

<u>Equipment/Facilities</u>
    Level III classroom

<u>Reviewer</u>	**<u>Action</u>**	**<u>Date</u>**
Faculty Preparer:		
Gary Schultz	*Faculty Preparer*	*Apr 20, 2016*
Department Chair/Area Director:		
Thomas Penird	*Recommend Approval*	*Apr 28, 2016*
Dean:		
Brandon Tucker	*Recommend Approval*	*May 19, 2016*
Curriculum Committee Chair:		
David Wooten	*Recommend Approval*	*Sep 19, 2016*
Assessment Committee Chair:		
Michelle Garey	*Recommend Approval*	*Sep 22, 2016*
Vice President for Instruction:		
Bill Abernethy	*Approve*	*Oct 04, 2016*