# Washtenaw Community College Comprehensive Report

## ROB 221 Robotics III
## 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:** 221
**Org Number:** 14430
**Full Course Title:** Robotics III
**Transcript Title:** Robotics III
**Is Consultation with other department(s) required:** No
**Publish in the Following:** College Catalog , Time Schedule , Web Page
**Reason for Submission:** New Course
**Change Information:**
**Rationale:** Combining ROB 222 & 223 to allow for more time to complete the simulation process and to allow students to work with different industrial software options.
**Proposed Start Semester:** Fall 2022
**Course Description:** In this course, students will learn to work with peripheral devices in various robotic workcells, advanced robotic software options, and be introduced to robotic simulation software. Students will learn how to build computer simulated models of robotic workcells and load the resulting programs into industrial robots. This course was previously ROB 222 and ROB 223.

## Course Credit Hours
**Variable hours:** No
**Credits:** 4
**Lecture Hours: Instructor:** 30 **Student:** 30
**Lab: Instructor:** 60 **Student:** 60
**Clinical: Instructor:** 0 **Student:** 0

**Total Contact Hours: Instructor:** 90 **Student:** 90
**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
Level 3

## Requisites
**Prerequisite**
ROB 212 minimum grade "C"
**Level II Prerequisite**
ELE 224

## General Education

## Request Course Transfer
### Proposed For:

## Student Learning Outcomes

1. Recognize the features of simulation software and simulation workflow procedures.
   ### Assessment 1
   Assessment Tool: Outcome-related departmental exam questions
   Assessment Date: Fall 2025
   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. Model 3-dimensional devices and incorporate them in simulation environments.
   ### Assessment 1
   Assessment Tool: Outcome-related practical lab
   Assessment Date: Fall 2025
   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: Departmentally-developed check sheet with rubric
   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. Utilize off-line programming techniques and crash avoidance feature for an existing simulation project.
   ### Assessment 1
   Assessment Tool: Outcome-related practical lab
   Assessment Date: Fall 2025
   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: Departmentally-developed check sheet with rubric
   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

4. Utilize advanced industrial robot software options.
   ### Assessment 1
   Assessment Tool: Outcome-related departmental exam questions
   Assessment Date: Fall 2025
   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 practical lab

Assessment Date: Fall 2025
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: Departmentally-developed check sheet with rubric
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. Explain simulation tools and proper software workflow.
2. Differentiate between simulation and animation.
3. Create an empty simulation project with a robot model and its accompanying controller.
4. Write basic robot programs to create robot motion in a simulated environment.
5. Utilize work objects, user frames and tool center points in a simulated environment.
6. Build simple mechanisms using robotic simulation software.
7. Create, activate, and use crash detection in a simulated environment.
8. Run a robotic simulation to test basic robot programs and export the final code.
9. Set up and configure simple vision applications for quality control.
10. Create and utilize multitasking programs on an industrial robot.
11. Set up and utilize robotic safety software.
12. Create and utilize robot back-ups in a simulated robotic workcell.

## New Resources for Course

## Course Textbooks/Resources

Textbooks
Manuals
Periodicals
Software

## Equipment/Facilities

| Reviewer | Action | Date |
|---|---|---|
| **Faculty Preparer:** | | |
| *Sean Martin* | *Faculty Preparer* | *Jan 27, 2022* |
| **Department Chair/Area Director:** | | |
| *Allan Coleman* | *Recommend Approval* | *Jan 27, 2022* |
| **Dean:** | | |
| *Jimmie Baber* | *Recommend Approval* | *Feb 01, 2022* |
| **Curriculum Committee Chair:** | | |
| *Randy Van Wagnen* | *Recommend Approval* | *Feb 22, 2022* |
| **Assessment Committee Chair:** | | |
| *Shawn Deron* | *Recommend Approval* | *Feb 23, 2022* |
| **Vice President for Instruction:** | | |
| *Kimberly Hurns* | *Approve* | *Feb 23, 2022* |