



Science, Technology, Engineering, and Mathematics (STEM) Division  
3322 College Drive, Vineland, NJ 08360  
856-691-8600

## **IT 241: Robotics and Motion Control**

Syllabus

Lecture Hours/Lab Hours/Credits: 2/2/3

### **Catalog Description**

**Prerequisite:** IT 211 or CSC 212

A study of the basics of industrial automation systems especially flexible manufacturing. Students gain an understanding of both industrial and commercial robotics technology including sensors. Laboratory work supports lecture topics.

### **Textbook and Course Materials**

It is the responsibility of the student to confirm with the bookstore and/or their instructor the textbook, handbook, and any other materials required for their specific course and section.

Click here to see current textbook prices at [cccnj.bncollege.com](http://cccnj.bncollege.com).

### **Evaluation Assessment**

#### **Online Proctoring**

All courses offered at RCSJ, whether they are web-enhanced, hybrid, or fully online, may include assessments that make use of Online Proctoring. To find out more about Online Proctoring, and to learn about the minimum technical requirements, visit [rcsj.edu/elearning/online-proctoring](http://rcsj.edu/elearning/online-proctoring).

**Grade Distribution** - Grading to be determined by individual instructors.

Individual instructors may include the following assessment(s):

- Classroom participation
- Homework assignments
- Classroom assignments
- Exams
- Team projects
- Individual projects

### **Grading**

The grading scale for each course and section will be determined by the instructor and distributed the first day of class.

## Rowan College of South Jersey Core Competencies

(Based on the NJCCC General Education Foundation - August 15, 2007; Revised 2011; Adopted 2014)

This comprehensive list reflects the core competencies that are essential for all RCSJ graduates; however, each program varies regarding competencies required for a specific degree. Critical thinking is embedded in all courses, while teamwork and personal skills are embedded in many courses.

1. **Written and Oral Communication:** Students will communicate effectively in both speech and writing.
2. **Quantitative Knowledge and Skills:** Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems
3. **Scientific Knowledge and Reasoning:** Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.
4. **Technological Competency:** Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals
5. **Society and Human Behavior:** Students will use social science theories and concepts to analyze human behavior and social and political institutions and to act as responsible citizens.
6. **Humanistic Perspective:** Students will analyze works in the fields of art, history, music, or theater; literature; philosophy and/or religious studies; and/or will gain competence in the use of a foreign language
7. **Historical Perspective:** Students will understand historical events and movements in World, Western, non-Western or American societies and assess their subsequent significance.
8. **Global and Cultural Awareness:** Students will understand the importance of a global perspective and culturally diverse peoples.
9. **Ethical Reasoning and Action:** Students will understand ethical issues and situations.
10. **Information Literacy:** Students will address an information need by locating, evaluating, and effectively using information.

## IT 241 Competencies

This course focuses on one of RCSJ's Core Competencies:

- Technological Competency

### Student Learning Outcomes: Robotics and Motion Control

Successful completion of IT 241 will help students:	RCSJ Core Competencies	Evaluation / Assessment (Additional means of evaluation may be included by individual instructors)
Describe in detail how industrial robot systems are used, structured and operated.	Technological Competency	<ul style="list-style-type: none"> <li>• Projects</li> <li>• Homework &amp; Classroom assignments</li> <li>• Exams</li> <li>• Participation</li> </ul>
Describe in detail the structure and operation of robotic tooling, including process control, component flows, machine safety and personal safety.	Technological Competency	<ul style="list-style-type: none"> <li>• Projects</li> <li>• Homework &amp; Classroom assignments</li> <li>• Exams</li> <li>• Participation</li> </ul>
Describe computer-aided production tools and data communication within an industrial robotics network.	Technological Competency	<ul style="list-style-type: none"> <li>• Projects</li> <li>• Homework &amp; Classroom assignments</li> <li>• Exams</li> <li>• Participation</li> </ul>
Identify fundamental issues within sustainable industrial development from an automation perspective and be able to exemplify the consequences of these.	Technological Competency	<ul style="list-style-type: none"> <li>• Projects</li> <li>• Homework &amp; Classroom assignments</li> <li>• Exams</li> <li>• Participation</li> </ul>
Implement and present a basic automation task with an industrial robot, including pilot study, online and offline programming and evaluation of the results, based on a given specification.	Technological Competency	<ul style="list-style-type: none"> <li>• Projects</li> <li>• Homework &amp; Classroom assignments</li> <li>• Exams</li> <li>• Participation</li> </ul>

## Topical Outline

- Robot survey
- Mechanical structure
- Drives, precision and repeatability of an industrial robot
- Use of Industrial robots
- Programming of industrial robots
- Simulation tools for offline programming of industrial robots
- Integration in production systems
- Production within industrial networks
- PLC programming
- Safety aspects of automation
- Actuators and Sensors
- Sustainable automation

## Affirmative Action Statement

The Board of Trustees is committed to providing a work and academic environment that maintains and promotes affirmative action and equal opportunity for all employees and students without discrimination on the basis of certain enumerated and protected categories. These categories are race, creed (religion), color, national origin, nationality, ancestry, age, sex (including pregnancy and sexual harassment), marital status, domestic partnership or civil union status, affectional or sexual orientation, gender identity or expression, atypical hereditary cellular or blood trait, genetic information, liability for military service, or mental or physical disability, including AIDS and HIV related illnesses.

For questions concerning discrimination, contact Almarie J. Jones, Special Assistant to the President, Diversity and Equity/Title IX and Compliance, 856-415-2154 or [ajones@rcsj.edu](mailto:ajones@rcsj.edu) or (Cumberland) Nathaniel Alridge, Jr., JD, Director, Diversity and Equity/Title IX and Judicial Affairs, 856-691-8600, ext. 1414 or [nalridge@rcsj.edu](mailto:nalridge@rcsj.edu). For disability issues or any barriers in the learning or physical environment related to a document condition/disability please contact: Gloucester campus – Carol Weinhardt, Director, Department of Special Services, ADA/504 Officer at 856-415-2247 or [cweinhar@rcsj.edu](mailto:cweinhar@rcsj.edu); or Cumberland Campus – Meredith Vicente, Senior Director, Department of Special Services/Project Assist at 856-200-4688 or [mvicent1@rcsj.edu](mailto:mvicent1@rcsj.edu)

## Department of Special Services

The Department of Special Services is committed to providing support services and ensuring equal access to eligible students with documented conditions/disabilities as outlined by the Americans with Disabilities Act (ADA) and the Americans with Disabilities Act with Amendments Act (ADAAA).

### (Gloucester Campus Location and Contact)

Location: Instructional Center, room 425A.

Primary Contact: Director, Carol Weinhardt, (email) [cweinhar@rcsj.edu](mailto:cweinhar@rcsj.edu); or (phone) 856-415-2247.

### (Cumberland Campus Location and Contact)

Location: Center for Academic & Student Success (CASS)

Primary Contact: Senior Director, Meredith Vicente, (email) [mvicent1@rcsj.edu](mailto:mvicent1@rcsj.edu); or (phone) 856-200-4688.

## Reporting Allegations of Sexual Assault Resource Referrals (8/2021)

### Cumberland Campus

There are multiple safe places for students to report allegations of sexual assault, both on and off campus.

Reports of sexual assault can be made to any of the following offices listed in the chart below.

All students are encouraged to report alleged crimes on campus.

Employees must report crimes that pose an immediate threat to the campus Security Office, the local Police Department or the Sheriff's Office.

Service	Resource	Phone Number/Location/Website
<b>Non-Confidential</b> Reporting  Law Enforcement	Vineland Police Dept.  Millville Police Department  Cumberland Co. Sheriff's Office  Cumberland County Emergency Services  Cumberland Campus Security 856-200-4706 (Direct)	856-691-4111  856-825-7010  856-451-4449  <b>9-1-1</b>  Andres Lopez, Director Safety and Security 856-200-4706
<b>Non-Confidential</b>   On-Campus Reporting Support Services	Almarie J. Jones Special Assistant to the President Diversity and Equity, Title IX and Compliance  Nathaniel Alridge, Jr., JD, Director Diversity and Equity, Title IX and Judicial Affairs  Kellie W. Slade Executive Director Student Services, Student Life	856-415-2154 Gloucester Campus College Center, Room 116 <a href="mailto:ajones@rcsj.edu">ajones@rcsj.edu</a>  856-498-9948 Catherine J. Arpino Education and Humanities Center, <a href="mailto:nalridge@rcsj.edu">nalridge@rcsj.edu</a>  856-200-4615 Student & Enrollment Services Center <a href="mailto:kslade@rcsj.edu">kslade@rcsj.edu</a>
<b>Confidential</b> On-Campus Counseling and Support Services	Student Counseling and Wellness Center John Wojtowicz, LCSW	Academic Building – 1 <sup>st</sup> floor 856-200-4760 <a href="mailto:jwojtowi@rcsj.edu">jwojtowi@rcsj.edu</a>
<b>Confidential</b> Off-Campus Full-Service Support	Center for Family Services – Services Empowering Rights of Victims (SERV)	24/7 Hotlines Cumberland Co. – 1-800-225-0196 <a href="http://www.centerffs.org/serv">www.centerffs.org/serv</a>
<b>Hospital</b> Sexual Assault Nurse Examiner on Site	Inspira Medical Center Vineland	1505 W. Sherman Ave., Vineland, NJ 856-641-8000