
East Tennessee State University • Department of Engineering Technology
ENTC 4517/5517-001 • Industrial Automation & Robotics • Fall 2012



Instructor	Mr. Garth Ghearing
Classroom	111C Wilson Wallis Hall
Class times	Thursday 4:00-9:45pm
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Phone	(423) 439-7825
Office	111A Wilson Wallis Hall
Office Hours	MW 11:30am-12:30pm & Fri 9:20am-12:30pm
Class Homepage	https://elearn.etsu.edu/d2l/

I Course Description, Credit Hours, and Prerequisites

ENTC 4517/5517 Industrial Automation and Robotics (4 hours)— Prerequisite: ENTC 2510 or permission of instructor. This course covers the integration of robotics, programmable logic controllers, and hard automation into new and existing manufacturing processes. Lecture and laboratory.

II Course Objectives

The student successfully completing this course should be able to:

- Develop effective process layouts while considering safety and efficiency
- Design and implement tooling for manipulators
- Design and implement compliance rigging for manipulators and conveyor systems
- Use programmable logic controllers together with new and existing robotic and automated sections of a system
- Understand multi-rigid-body dynamics
- Understand when and how to enable human intervention in automatic processes
- Use 2D and 3D simulation software to plan and test processes
- Use basic knowledge of lean and flexible manufacturing techniques to optimize the flow and efficiency of the automated system
- Use program planning and task modeling to develop effective production plans
- Understand the types of sensors available and when each is appropriate in the production process
- Use sensors and automation to develop computer aided/automated quality assurance systems
- Build hard automation systems using sensors and switches with servo, stepper, and basic DC motors
- Develop safety systems for new and existing processes using automated alerts, stops/reversals, and shutdowns.

III Texts and Materials

Programming and Operating Manuals:

Each robotic system, conveyor, PLC, and automated system has its own set of manuals and materials; these will be provided as part of the laboratory assignments.

Special Materials and Custom Parts:

Students desiring to use special materials or incorporate custom parts for the final project should make special arrangements with the instructor as early as possible. Students are responsible for design and/or CNC program development of any customized parts such as end of arm tooling, compliant part holders, stands and holders, etc. and may incur additional costs for complex, large, and/or exotic choices of materials.

IV Attendance Policy

Attendance may be taken at any time during each class meeting. Your presence and participation are important. In-class design/programming assignments will not necessarily be announced prior to those class meeting(s). All major exams and term project assignments will be announced at least five calendar days prior to the test/due date.

Students are responsible for the material covered in all class sessions as well as all assignments.

V Evaluation and Grading

Grading is based on your performance as revealed in your in-class laboratories, homework assignments, project presentation and report, the midterm exam, and the final exam.

	Percent of Final Grade
1. REQUIRED LABORATORY ASSIGNMENTS.....	30%
2. PROJECT PRESENTATION (Peer Evaluation)	20%
3. PROJECT REPORT (with documentation, videos, PowerPoint file, etc).....	50%
	Total 100%

I reserve the right to change this grading system during the semester as circumstances change.

Minimum Score to Receive

A = 90	B+ = 87	B = 83	B- = 80	C+ = 77
C = 73	C- = 70	D+ = 67	D = 60	F = Below 60%

Homework & Assignments:

A test, exercise, or paper may be given (or submitted) early for a University sponsored absence (please provide suitable notice, if possible). Make-up tests may be given at the discretion of the instructor and only if a student presents suitable documentation (evidence) explaining the (emergency) absence to the instructor.

Quizzes and exams may include any material covered in the lectures, assigned readings, videos, classroom discussions or exercises.

Students with documented needs for note taking, test taking, or other classroom accommodations should make arrangements with the instructor early in the term. Contact the ETSU Disability Services, Lower Level D.P. Culp Center (Seahorn Rd. entrance)
Voice: (423) 439-8346; Fax: (423) 439-8489; TDD: (423) 439-8370

VI Attachment Link for Academic Misconduct, Disabilities, Counseling, Dates, Tutoring, etc.
<http://www.etsu.edu/reg/academics/syllabus.aspx>