

---

**East Tennessee State University • Department of Engineering Technology**  
**ENTC 2510-001 • Introduction to Robotics • Spring 2012**



<b>Instructor</b>	Mr. Garth Ghearing
<b>Classroom</b>	111C Wilson Wallis Hall
<b>Class times</b>	Mon., Wed., & Fri. 11:30-1:30PM
<b>E-mail</b>	ghearingg@etsu.edu
<b>Phone</b>	(423) 439-7825
<b>Office</b>	111A Wilson Wallis Hall
<b>Office Hours</b>	Mon., Wed., & Fri. 6:45-9:15AM
<b>Class Homepage</b>	<a href="https://elearn.etsu.edu/d2l/">https://elearn.etsu.edu/d2l/</a>

---

## **I Course Description, Credit Hours, and Prerequisites**

Introduction to Robotics (3 hours)— Prerequisite: CSCI 2100 or permission of instructor. Theory, fundamental concepts, and applications of robotics and computer-aided manufacturing. History, robot elements and types, actuators and manipulators, programmable systems, vision systems, safety, robotics work cells, applications, and economic analysis. Lecture and laboratory.

## **II Course Objectives**

As an outcome of successful completion of the course, the student should:

The student successfully completing this course will be able to:

- Name and describe all the elements of a robot system.
- Classify a robot based on arm geometry, power sources, applications, control techniques and path control.
  - Apply the robot selection criteria and robot survey in the design of an automated work cell.
  - Apply the work-cell design checklist to the design of an automated system.
  - Describe the differences between different special purpose grippers and special purpose tools.
  - Select the appropriate sensors given the parameters for a sensing application and integrate the sensor using good design practices.
    - Describe the procedure used to safeguard an automated work cell.
    - Develop a complete safety system for a robotics work cell.
    - Understand at least three robot programming languages

## **III Texts and Materials**

### **Required Textbook:**

None

### **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. LABORATORIES .....	30%
2. FIRST MAJOR EXAM .....	20%
3. PROJECT PRESENTATION (Peer Evaluation) .....	10%
4. PROJECT REPORT (with Powerpoint file, CD, etc) .....	20%
5. SECOND MAJOR EXAM .....	20%
	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>